Verb-second in grammar, processing, and acquisition

What you see is not what you get

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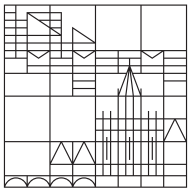

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Von allen Gedanken
schätze ich doch am meisten
die interessanten.

(Sterne 1997)

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One of the most fantastic aspects, and in a way a compensation to linguists' party problem of the *How many languages do you speak?*-kind, is to break to native speakers obvious facts about their mother tongue, which never crossed their mind. I came across such a case described by Hulstijn (1984: 69) who wrote that "[t]he Turkish S[ubject]s were amazed when I pointed out to them in the interview that Turkish has a verb final rule also [similar to Dutch]; it had never occurred to them to make a comparison.". Similarly, pointing out to Germans that we have two different word orders, for main and subordinate clauses, was a fantastic experience. Many times you could really observe how the insight was hitting the vis-à-vis and finally manifested itself in an invaluable facial expression.

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Abstract

The verb second (V2) phenomenon received a lot of attention in last decades. By now, it is widely accepted among syntacticians that the finite verb originates from a base position and is moved into the left periphery of the clause. However, it still remains to be resolved why the verb has to move. One particular aspect of V2-movement is that such a prominent formal transformation seems to be independent of the meaning of the moved element. V2-movement applies generally and affects only the finite verb irrespective of whether it is a lexical verb as in *Ich* ***höre*** *ein Lied* 'I hear a song', an auxiliary such as *habe* 'have' in *Ich* ***habe*** *ein Lied gehört* 'I heard a song', or a part of a particle verb such as *auf-hören* 'stop, lit. up-hear' in *Ich* ***höre*** *zu singen* ***auf*** 'I stop singing'. The present work addresses the question which role the lexical content of the moved element plays during sentence processing. The main answer is that the lexical content of the V2-verb is interpreted only at the end of the clause, i. e. at the base position of the finite verb. The investigations are carried out on three levels: grammar, sentence processing, and language acquisition.

The first part provides an overview of the main characteristics of the V2-phenomenon and the most important analyses. Subsequently, the central hypothesis of this dissertation is introduced, the V2-Reconstruction Hypothesis. It states that V2-movement targets only the finiteness features of the finite verb, which are represented by inflectional affixes. The lexical part of the verb only moves along because the affixes cannot move on their own. As a consequence, the lexical part has to be reconstructed into its clause-final base position where it is interpreted. Two groups of evidence are presented in support of the V2-Reconstruction Hypothesis: First, I show that the V2-position is systematically filled with surface elements which must not be interpreted and second, I present evidence which indicates that the finite verb has to be interpreted in its base position.

The second part provides the general background for the experimental investigations by introducing the basic properties of on-line language comprehension with a focus on the syntactic domain. I show that deviation from strict on-line processing, as assumed by the V2-Reconstruction Hypothesis, occurs regularly and is well-documented for related phenomena, e. g. *wh*-movement. A review of experimental investigations of sentence processing in German indicates that previous findings are in accordance with the predictions of the V2-Reconstruction Hypothesis. Against this background, I present the results of four self-paced reading experiments that test predictions of the V2-Reconstruction Hypothesis concerning on-line sentence processing. The experiments use three different phenomena, i. e. NPI-licensing, infinitive selection, and thematic-role assignment, to detect the temporal profile of the processing influence of the V2-element. Grammaticality contrasts that are dependent on the interpretation of the finite verb in V2-position show up at the reconstruction site of the verb indicating that this is the point of interpretation and thereby confirming the predictions of the V2-Reconstruction Hypothesis.

The third part reviews main findings about the L1- and L2-acquisition of V2-order. The comparison shows that the differences between the two developmental paths can be accounted for by values of the head-parameters of the learners' grammars. In L1-acquisition, children only produce head-final VPs resulting in the correct object$\prec$verb-order. In L2-acquisition the headedness of the VP is subject to L1-transfer. Furthermore, in L1-acquisition,

the IP is robustly realized head-finally whereas L2-learners assume a head-initial IP. This difference in parametrization explains typical error patterns of L2-learners. Based on these findings, I present four psycholinguistic experiments which investigate the mastering as well as characteristic error patterns of German word order by L2-learners. The participants were recruited from two groups corresponding to the basic word order of their L1, i. e. OV vs. VO. In connection to the V2-Reconstruction Hypothesis, the experiments investigated whether the leaner groups show L1-specific processing profiles in response to V2-structures. The results indicate that L1-specific processing routines influence the processing in L2-contexts.

Zusammenfassung

Das Phänomen der Verbzweitstellung (V2) hat in den letzten Jahrzehnten viel Aufmerksamkeit erfahren. Breite Einigkeit besteht über die syntaktische Analyse dieser Wortstellung, nämlich dass sich das finite Verb von seiner Basisposition in die linke Satzperipherie bewegt. Dagegen ist noch weitgehend ungeklärt, warum diese Bewegung stattfinden muss. Eine bemerkenswerte Eigenschaft der V2-Bewegung ist, dass eine formal so folgenschwere Operation scheinbar unabhängig vom Bedeutungsgehalt des bewegten Verbs ist. So ist es immer das finite Verb, das sich bewegt, ganz gleich, ob es sich um ein lexikalisches Verb handelt *Ich* ***höre*** *ein Lied*, um ein Auxiliar *Ich* ***habe*** *ein Lied gehört*, oder um den Teil eines Partikelverbs *Ich* ***höre*** *zu singen* ***auf***. Die vorliegende Arbeit widmet sich im Kern der Frage, welche Rolle der Inhalt des V2-Verbs beim Verstehensprozess eines Satzes spielt. Die Hauptantwort darauf lautet, dass der lexikalische Inhalt des V2-Verbs erst am Satzende, d. h. in seiner Basisposition, interpretiert wird. Die Forschungsfrage wird auf drei Ebenen untersucht: Grammatik, Satzverarbeitung und Spracherwerb.

Nach einem Überblick über die grundlegenden Eigenschaften des V2-Phänomens und den wichtigsten theoretischen Ansätzen wird die zentrale Hypothese der Arbeit eingeführt, die V2-Rekonstruktionshypothese. Diese besagt, dass im Grunde nur die Flexionsendung des finiten Verbs von der V2-Bewegung betroffen ist. Der lexikalische Teil des Verbs bewegt sich nur, weil die Flexionsendung ihre Position nicht unabhängig verändern kann. Daraus folgt, dass der lexikalische Teil des Verbs in seine Basisposition *rekonstruiert* werden muss und dort interpretiert wird. Die Hypothese wird durch zwei Gruppen von grammatischer Beobachtungen gestützt: Die eine Gruppe behandelt Probleme, die sich aus der Interpretation des finiten Verbs in der V2-Position ergeben. Die zweite Gruppe verdeutlicht, dass das finite Verb in seiner Basisposition interpretiert werden muss.

Im zweiten Teil werden zentrale Eigenschaften des menschlichen Sprachverabeitungsapparats skizziert. Weiterhin wird gezeigt, dass eine verzögerte Verarbeitung von sprachlichen Elementen, wie sie von der V2-Rekonstruktionshypothese angenommen wird, bei verwandten Phänomenen, wie z. B. *W*-Bewegung, vielfach nachgewiesen wurde. Eine zusammenfassende Betrachtung experimenteller Untersuchungen der Satzverarbeitung des Deutschen zeigt, dass die Ergebnisse vorangegangener Studien den Vorhersagen der V2-Rekonstruktionshypothese mitunter sehr genau entsprechen. Basierend auf diesen Erkenntnissen werden vier eigene Lesezeitstudien vorgestellt, die NPI-Lizenzierung, Infinitivselektion und Wortstellungspräferenzen nutzen, um die Vorhersagen der V2-Rekonstruktionshypothese zu überprüfen. Die Ergebnisse deuten darauf hin, dass das finite Verb in die frühestmögliche Basisposition rekonstruiert wird, auch wenn sich diese später als ungrammatisch herausstellt. Diese experimentellen Erkenntnisse liefern somit weitere Evidenz, die die V2-Rekonstruktionshypothese stützt.

Im dritten Teil werden die zentralen Beobachtungen und Analysen bezüglich der Wortstellung im L1- und L2-Spracherwerb vorgestellt und verglichen. Es zeigt sich, dass sich die grundlegenden Unterschiede der beiden Erwerbspfade durch die Wahl des Kopfparameters in der Lernergrammatik beschreiben lassen. Dies betrifft zum einen die VP: Im L1-Erwerb wird die Basisabfolge von Objekt und Verb von Beginn an fehlerfrei realisiert, wohingegen sie im L2-Erwerb von der jeweiligen L1 transferiert wird. Weiterhin wird im L1-Erwerb die

IP von Beginn an kopffinal realisiert. Im L2-Erwerb hingegen wird sie anfänglich als kopfinitiale Phrase realisiert, wodurch L2-spezifische Wortstellungsfehler erklärt werden können. Basierend auf diesen Erkenntnissen werden vier psycholinguistische Experimente mit L2-Lernern des Deutschen vorgestellt. Die Probanden unterscheiden sich hinsichtlich der Grundwortstellung ihrer Muttersprache, d. h. OV vs. VO. In Anlehnung an die V2-Rekonstruktionshypothese wird untersucht, ob die zwei Lernergruppen L1-spezifische Verarbeitungsprofile bei deutschen V2-Strukturen aufweisen. Die Studien weisen darauf hin, dass die L1-Verarbeitungsroutinen die L2-Verarbeitung beeinflussen.

Contents

Acknowledgments i

Abbreviations xix

1 Introduction 1

I The grammatical perspective on V2-movement 5

2 The Syntax of V2 7
2.1 Observations: The facts about V2 . . . 7
2.1.1 The core cases: V2, V1 and V-final . . . 7
2.1.2 The prefield: What precedes the finite verb? . . . 9
2.1.3 Restrictions on V2-movement . . . 10
2.1.4 Restrictions on prefield elements . . . 20
2.2 Exceptions: Non-V2 structures . . . 36
2.2.1 V-initial clauses . . . 36
2.2.2 V-final main clauses . . . 37
2.2.3 V>2 structures . . . 38
2.2.4 Summary of the non-V2 patterns . . . 41
2.3 Explanations: A brief history of syntactic accounts . . . 42
2.3.1 Insertion into the middle field . . . 42
2.3.2 V-to-C movement (plus phrasal movement) . . . 43
2.3.3 (A)symmetric V2: V-to-I movement in subject-initial clauses . . . 45
2.3.4 Two types of V2-movement: Force and Fin . . . 48
2.3.5 Remnant movement . . . 49
2.3.6 Semantico-pragmatic accounts of V2 . . . 53
2.3.7 Summary of the explanatory accounts . . . 54
2.4 Chapter summary . . . 54

3 The V2-Reconstruction Hypothesis 55
3.1 Defining the V2-Reconstruction Hypothesis . . . 55
3.1.1 Introduction . . . 55
3.1.2 A note on *movement*, *reconstruction*, and *pied-piping* . . . 56
3.1.3 Outlook . . . 60
3.2 The C-position: Challenging a lexical contribution at the surface position . . . 60
3.2.1 Particle verbs: V-to-C as movement of phonological words . . . 60

3.2.2 Semantically empty host I: Periphrastic *tun* . . . 63
3.2.3 Semantically empty host II: Verb doubling . . . 68
3.2.4 Semantically empty host III: Frisian *wer*-insertion . . . 71
3.2.5 Complementizer Agreement: Inflection on non-verbal C-elements . . . 73
3.2.6 Summary: Only agreement features in C . . . 76
3.3 The base position: Arguments for the necessity of reconstruction . . . 77
3.3.1 Association with focus . . . 77
3.3.2 Verbal negative polarity items: Only licensed in the base position . . . 79
3.3.3 Sentential negation: C-commanding the verbal base-position . . . 85
3.3.4 Summary: Lexical interpretation only in the base position . . . 89
3.4 Experiment 1: The lexical meaning of periphrastic *tun* (acceptability judgments) 90
3.4.1 Rationale . . . 90
3.4.2 Method . . . 92
3.4.3 Results . . . 96
3.4.4 Discussion . . . 98
3.5 Chapter summary . . . 98

II The role of V2-movement in sentence processing 101

4 Basics of sentence processing 103
4.1 Sentence processing: Apparatus and procedures . . . 103
4.1.1 Levels of representation . . . 103
4.1.2 Some thoughts about the architecture of the processor . . . 105
4.1.3 The role of grammar in a processing model . . . 106
4.1.4 On-line processing and incrementality . . . 107
4.2 Incrementality in parsing . . . 111
4.2.1 Anticipation: Parsing heuristics . . . 111
4.2.2 Delay: Filler-gap dependencies . . . 113
4.2.3 Consequences of incremental structure building: Constituency vs. c-command . . . 114
4.2.4 Incrementality and interpretation . . . 116
4.3 Configurationality of V2: The discrepancy between finite verb and lexical head 119
4.3.1 Auxiliary verbs . . . 120
4.3.2 Modal verbs . . . 120
4.3.3 Clustering verbs: Selecting non-finite complements . . . 121
4.3.4 Particle verbs . . . 122
4.3.5 Summary: A uniform parsing mechanism for V2-clauses . . . 124
4.4 Chapter summary . . . 124

5 Processing of German clauses 127
5.1 Scrambling . . . 127
5.1.1 Unambiguous case marking . . . 128
5.1.2 Ambiguous case marking . . . 129

5.2 XP-fronting . . . 130
5.2.1 Unambiguous case marking . . . 131
5.2.2 Ambiguous case marking . . . 132
5.3 The processing influence of the verb . . . 133
5.3.1 Thematic processing . . . 133
5.3.2 Attachment ambiguities . . . 137
5.3.3 Scope computing . . . 139
5.3.4 Processing of the verb: Anticipation and integration . . . 141
5.4 Chapter summary . . . 144

6 Experimental investigations of the V2-Reconstruction Hypothesis 145
6.1 Experiment 2: Reconstruction of the verbal NPI *brauchen* (self-paced reading) 145
6.1.1 Rationale . . . 146
6.1.2 Method . . . 148
6.1.3 Results . . . 151
6.1.4 Discussion . . . 153
6.2 Experiment 3: Follow-up study on the NPI *brauchen* (self-paced reading) . . . 161
6.2.1 Rationale . . . 161
6.2.2 Method . . . 161
6.2.3 Results . . . 164
6.2.4 Discussion . . . 167
6.3 Experiment 4: Reconstruction of infinitive-embedding verbs (self-paced reading) . . . 171
6.3.1 Rationale . . . 171
6.3.2 Method . . . 172
6.3.3 Results . . . 174
6.3.4 Discussion . . . 174
6.4 Experiment 5: Verb reconstruction and word order preferences (self-paced reading) . . . 178
6.4.1 Rationale . . . 178
6.4.2 Method . . . 180
6.4.3 Results and Discussion . . . 185
6.4.4 General discussion . . . 191
6.5 Summary of the experimental investigations . . . 201

7 Peculiarities of processing V2-clauses: Specifying the V2-Reconstruction Hypothesis 203
7.1 Properties of V2-processing . . . 203
7.1.1 The special status of subject-initial V2-clauses . . . 204
7.1.2 Aspects of (immediate) interpretation . . . 206
7.1.3 Structural build-up and verb reconstruction: Cascades vs. insertion . . . 208
7.2 Consequences and diagnostics for V2-parsing . . . 211
7.2.1 Temporary constituency: Right Node Raising with the exclusion of C 211
7.2.2 The preverbal area: Licensing direction and core interpretation domain 224

7.2.3 The postverbal area: Extraposition and its restrictions 227
7.2.4 Speculations about crosslinguistic generalizations 231
7.3 Chapter summary 234

III The role of V2-movement in language acquisition 235

8 V2 in L1-acquisition 237
8.1 V2-related observations in L1-acquisition 238
8.1.1 Data base 238
8.1.2 Verb placement 238
8.1.3 Acquisition of finiteness, tense and agreement 242
8.1.4 Verb doubling 243
8.1.5 Verb placement in the L1-acquisition of other V2-languages 246
8.2 Theoretical accounts of the L1-acquisition of V2 247
8.3 Summary 250

9 V2 in L2-acquisition 253
9.1 Data base 253
9.2 General observations 254
9.2.1 Verb placement 254
9.2.2 Dummy Auxiliaries 260
9.2.3 The role of finiteness, tense and agreement 262
9.3 Theoretical accounts of the L2-acquisition of V2 263
9.3.1 The hypothesis space: An overview 263
9.3.2 The role of L1-transfer in the L2-acquisition of German 264
9.3.3 The role of functional categories in the L2-acquisition of German . . 265
9.4 Summary and comparison with L1-acquisition 269

10 Experimental investigations of verb placement in L2-German 271
10.1 General remarks about the L2-experiments 272
10.1.1 The L2-participants 272
10.1.2 The testing environment and procedure 273
10.2 Experiment 6: Word order in embedded clauses (elicited production task) . . 274
10.2.1 Rationale 274
10.2.2 Method 275
10.2.3 Results 280
10.2.4 Discussion 287
10.3 Experiment 7: Word order in embedded clauses (elicited imitation task) . . . 288
10.3.1 Rationale 288
10.3.2 Method 289
10.3.3 Results 294
10.3.4 Discussion 302

10.4 Experiment 8: Parsing of basic word order in matrix clauses (sentence matching task) . . . 306
10.4.1 Rationale . . . 306
10.4.2 Method . . . 308
10.4.3 Results . . . 311
10.4.4 Discussion . . . 314
10.5 Experiment 9: Parsing of basic word order in subordinate clauses (sentence matching task) . . . 315
10.5.1 Rationale . . . 315
10.5.2 Method . . . 315
10.5.3 Data analysis . . . 316
10.5.4 Results . . . 316
10.5.5 Discussion . . . 317
10.6 General discussion . . . 319

11 Grand summary and conclusion **321**

A Appendix **327**
A.1 Instructions and materials from Experiment 1 (acceptability judgment task) . 327
A.1.1 Instructions . . . 327
A.1.2 Practice items . . . 329
A.1.3 Experimental items . . . 329
A.2 Instructions and materials from Experiment 2 (self-paced reading task) . . . 336
A.2.1 Instructions . . . 336
A.2.2 Practice items . . . 337
A.2.3 Experimental items . . . 338
A.3 Instructions and materials from Experiment 3 and 4 (self-paced reading task) 345
A.3.1 Instructions . . . 345
A.3.2 Practice items . . . 346
A.3.3 Experimental items of Experiment 3 . . . 347
A.3.4 Experimental items of Experiment 4 . . . 358
A.4 Instructions and materials from Experiment 5 (self-paced reading task) . . . 361
A.4.1 Instructions . . . 361
A.4.2 Practice items . . . 362
A.4.3 Experimental items . . . 363
A.4.4 Agentive controls . . . 385
A.4.5 Configurational controls . . . 388
A.5 Information about the L2-participants . . . 391
A.6 Instructions and materials from Experiment 6 (elicited production task) . . . 395
A.6.1 Instructions . . . 395
A.6.2 Practice items . . . 395
A.6.3 Experimental items . . . 396
A.7 Instructions and materials from Experiment 7 (elicited imitation task) . . . 404
A.7.1 Instructions . . . 404

A.7.2 Practice items . . . 404
A.7.3 Experimental items . . . 405
A.7.4 Filler items . . . 409
A.8 Instructions and materials from Experiment 8 and 9 (sentence matching task) 410
A.8.1 Instructions . . . 410
A.8.2 Practice items . . . 410
A.8.3 Experimental items of Experiment 8 . . . 411
A.8.4 Experimental items of Experiment 9 . . . 419
A.8.5 Filler items . . . 422

Bibliography **425**

List of Figures

3.1 Mean Z-scores of the acceptability ratings of experiment 1 96

4.1 Schematic of the language-based communication process 105

5.1 Reading times of the SPR-experiment in Bott & Schlotterbeck (2015: 68) . . . 141

6.1 Mean reading times for the first infinitive + adverb region of Experiment 2 (95 % CI) 152
6.2 Mean reading times for the second infinitive + spillover region of Experiment 2 (95 % CI) 153
6.3 Mean reading times for the uniform initial region of interest in Experiment 3 (95 % CIs) 165
6.4 Mean reading times for the continuation of the LOW.NEGATION conditions in Experiment 3 (95 % CIs) 166
6.5 Mean reading times for the continuation with the second VP structure in Experiment 3 (95 % CIs) 166
6.6 Mean reading times in from the V2-position until the spillover region in Experiment 4 (95 % CIs) 174
6.7 Mean reading times for the initial part of Experiment 5 (95 % CIs) 186
6.8 Mean reading times for the clause-final verb and the spillover region in Experiment 5 (95 % CIs) 187
6.9 Mean reading times for the summarized regions of the spillover are in Experiment 5 (95 % CIs) 187
6.10 Mean reading times of the main clause segments for the experimental items of Experiment 5 and the AGENTIVE controls in the SO order only (95 % CIs) . 189
6.11 Mean reading times for the summed spillover regions of Experiment 5 with the AGENTIVE controls (95 % CIs) 190
6.12 Mean reading times for the CONFIGURATIONAL controls in Experiment 5 (95 % CIs) 191

8.1 Summary of the developmental changes during the L1-acquisition of V2 . . 251

10.1 Mistakes in Experiment 6 (elicited production task) per participant groups . 282
10.2 Verb position in the embedded clause in the final attempt in Experiment 6 . 284
10.3 Verb position in the *wh*-interrogative clauses in the final attempt of producing the target sentence in Experiment 6 286
10.4 Mistakes in Experiment 7 (elicited imitation task) 294

10.5 Position of the finite verb in the second clause of the filler sentences in Experiment 7 . . . 295
10.6 Elicited imitation task: Ultimate verb position in the embedded clause per participant group and input condition. . . . 297
10.7 Elicited imitation task: Deviating verb position in the embedded clauses in response to the V-FINAL condition per clause type. . . . 298
10.8 Elicited imitation task: Rate of correcting V2-input to V-final clauses 298
10.9 Elicited imitation task: Rate of missing finite verb (auxiliary) per participant group and input condition. . . . 301
10.10 Elicited imitation task: Verb doubling in matrix and embedded clauses. . . . 302
10.11 Scheme of the sentence matching task . . . 309
10.12 Mean reaction times for verb position in matrix clauses in Experiment 8 (95 % CIs) . . . 312
10.13 Mean reaction times for verb position in embedded clauses in Experiment 9 (95 % CIs) . . . 317

List of Tables

3.1 Types of movement . . . 56
3.2 Structural variant of the verb types used in experiment 1 . . . 94
3.3 Output of the LME model for the Clause Type-analysis in experiment 1 . . . 97
3.4 Output of the LME model for the tun-periphrasis-analysis in experiment 1 97

5.1 Case marking and syncretism in German . . . 129

6.1 Output of the LME model for first inifinitive (*drucken*) in Experiment 2 . . . 155
6.2 Output of the LME model for first adverb segment (*unter*) in Experiment 2 . 155
6.3 Output of the LME model for second adverb segment (*Umständen*) in Experiment 2 . . . 156
6.4 Output of the LME model for first inifinitive + adverb region (*drucken unter Umständen*) in Experiment 2 . . . 156
6.5 Output of the LME model for second infinitive particle (*zu*) in Experiment 2 157
6.6 Output of the LME model for second infinitive (*verbieten*) in Experiment 2 . 157
6.7 Output of the LME model for second infinitive region (*zu verbieten*) in Experiment 2 . . . 158
6.8 Output of the LME model for the adjective of the spillover region (*mediale*) in Experiment 2 . . . 158
6.9 Output of the LME model for the noun of the spillover region (*Interesse*) in Experiment 2 . . . 159
6.10 Output of the LME model for the infinitive particle of the spillover region (*zu*) in Experiment 2 . . . 159
6.11 Output of the LME model for the verb of the spillover region (*wecken*) in Experiment 2 . . . 160
6.12 Output of the LME model for the final 3-segments-region of the spillover region (*Interesse zu wecken*) in Experiment 2 . . . 160
6.13 Output of the LME model for noun of the PP (*Verlag*) in Experiment 3 . . . 168
6.14 Output of the LME model for particle of the first infinitive (*zu*) in Experiment 3 . . . 168
6.15 Output of the LME model for first infinitive (*schicken*) in Experiment 3 . . . 169
6.16 Output of the LME model for first infinitive region (*zu schicken*) in Experiment 3 . . . 169
6.17 Output of the LME model for first segment of the adverbial (*unter*) in Experiment 3 . . . 169
6.18 Output of the LME model for second segment of the adverbial (*Umständen*) in Experiment 3 . . . 170

6.19 Output of the LME model for the adverbial of the second VP (*sofort*) in Experiment 3 . . . 170
6.20 Output of the LME model for the adjective of the spillover region (*rechtliche*) in Experiment 3 . . . 170
6.21 Pairs of cluster verb in Experiment 4 . . . 173
6.22 Output of the LME model for determiner of the subject (*der*) in Experiment 4 176
6.23 Output of the LME model for the first infinitive (*navigieren*) in Experiment 4 176
6.24 Output of the LME model for the first adverb segment (*am*) in Experiment 4 176
6.25 Output of the LME model for the second 2-segment adverb region (*am Anfang*) in Experiment 4 . . . 177
6.26 Output of the LME model for the second infinitive (*lernen*) in Experiment 4 . 177
6.27 Output of the LME model for DP1-segment in Experiment 5 . . . 193
6.28 Output of the LME model for high adverb *letztens* in Experiment 5 . . . 193
6.29 Output of the LME model for DP2-segment in Experiment 5 . . . 194
6.30 Output of the LME model for the low adverb *total* in Experiment 5 . . . 194
6.31 Output of the LME model for DP2-segment in the V-FINAL condition in Experiment 5 . . . 194
6.32 Output of the LME model for clause-final verb in Experiment 5 . . . 195
6.33 Output of the LME model for spillover segment 1 *obwohl* of the V2-subgroup in Experiment 5 . . . 195
6.34 Output of the LME model for spillover segment 2 *die Bienen* of the V2-subgroup in Experiment 5 . . . 195
6.35 Output of the LME model for spillover segment 4 *waren* of the V2-subgroup in Experiment 5 . . . 196
6.36 Output of the LME model for spillover segment 4 *waren* of the V-FINAL-subgroup in Experiment 5 . . . 196
6.37 Output of the LME model for spillover segment 1+2 *obwohl die Bienen* of the V2-subgroup in Experiment 5 . . . 196
6.38 Output of the LME model for spillover segment 3+4 *ziemlich angriffslustig waren* of the V2-subgroup in Experiment 5 . . . 197
6.39 Output of the LME model for spillover segment 3+4 *ziemlich angriffslustig waren* of the V-FINAL-subgroup in Experiment 5 . . . 197
6.40 Output of the LME model for the DP1-segment with the AGENTIVE controls in Experiment 5 . . . 197
6.41 Output of the LME model for spillover segment 1+2 with the AGENTIVE controls in Experiment 5 . . . 198
6.42 Output of the LME model for the region consisting of spillover segment 3+4 with the AGENTIVE controls in Experiment 5 . . . 198
6.43 Output of the LME model for DP1-segment of the CONFIGURATIONAL controls in Experiment 5 . . . 198
6.44 Output of the LME model for the high adverb segment of the CONFIGURATIONAL controls in Experiment 5 . . . 199
6.45 Output of the LME model for DP2-segment of the CONFIGURATIONAL controls in Experiment 5 . . . 199

6.46 Output of the LME model for spillover segment 1 of the CONFIGURATIONAL controls in Experiment 5 . . . 199
6.47 Output of the LME model for spillover segment 2 of the CONFIGURATIONAL controls in Experiment 5 . . . 200

10.1 First languages of the Indian participants at JNU . . . 272
10.2 Overview of the L2-participant groups . . . 273
10.3 Data concerning the acquisition biography of the L2-participants per group 273
10.4 Annotation scheme for Experiment 6 (elicited production task) . . . 281
10.5 Output of the GLME model for the elicited production task: correct vs. incorrect word order per participant groups and clause order in Experiment 6 . . . 285
10.6 Output of the GLM for the elicited production task: correct vs. incorrect word order per clause types and clause order in Experiment 6 . . . 286
10.7 Annotation scheme for Experiment 7 (elicited imitation task) . . . 293
10.8 Output of the GLME model for the elicited imitation task: correction rate per participant groups . . . 298
10.9 Output of the GLME model for the elicited imitation task: correction rate per clause types . . . 300
10.10 Output of the generalized linear model for the elicited imitation task: missing auxiliary rate per participant groups . . . 301
10.11 Output of the GLME model for the elicited imitation task: verb doubling in embedded clauses . . . 303
10.12 Output of the generalized linear model for the elicited imitation task: verb doubling in matrix clauses . . . 303
10.13 Possible permutation according to headedness parameters of VP, TP, and CP 307
10.14 Presentation intervals (in seconds) of the sentence matching procedure for native speakers and L2-learners . . . 309
10.15 Output of the LME model for the JNU-high group in Experiment 8: Reaction time per experimental conditions . . . 312
10.16 Output of the LME model for the UVR-high group in Experiment 8: Reaction time per experimental conditions . . . 313
10.17 Output of the LME model for the UVR-low group in Experiment 8: Reaction time per experimental conditions . . . 313
10.18 Output of the LME model for the native speakers in Experiment 9: Reaction time per experimental conditions . . . 318
10.19 Output of the LME model for the JNU-low group in Experiment 9: Reaction time per experimental conditions . . . 318
10.20 Output of the LME model for the UVR-low group in Experiment 9: Reaction time per experimental conditions . . . 318

Abbreviations

1	first person
2	second person
3	third person
ACC	accusative
ADV	adverb
AUX	auxiliary
DAT	dative
DEF	definite
EC	embedded clause
ERG	ergative
EXPL	expletive
F	feminine
FOC	focus
GEN	genitive
IMP	imperative
INF	infinitive
LIC	licensor
M	masculine
MC	main clause
N	neuter
NEG	negation
NOM	nominative
NPI	negative polarity item
OBJ	object
OV	object$\prec$verb
PL	plural
PPI	positive polarity item
PRT	particle
PRS	present
PST	past
PTCP	participle
REFL	reflexive
REL	relativizer/relative pronoun
SG	singular
SOV	subject$\prec$object$\prec$verb
SUB	subject
SUBJ	subjunctive
SVO	subject$\prec$verb$\prec$object
V1	verb first
V2	verb second
V-final	verb-final
VO	verb$\prec$object

1 Introduction

What you see is not what you get, this subtitle refers to catchphrases used in computing to distinguish different text-editing systems. Two concepts are frequently opposed. Editors that directly display the final output, like MS-Word, are so-called *what you see is what you get*-editors. Other systems, like LaTeX, require the user to specify the semantic structure and properties of the content by instructions in a markup language. The final output is only perceivable after compiling the code, i. e. the visual feedback of the editor and the printer output may differ significantly. Consequently, these systems are called *what you get is what you mean*-editors. What is the connection to this dissertation? The core of this work is a hypothesis stating that the surface position of the finite verb in verb second (V2) clauses (*what you see*) is not the position in which the finite verb is interpreted (*what you get*). It is now commonly accepted among linguists that the V2-order is a derived order stemming from a transformation of the V-final base order. To my knowledge, Josef Bayer was the first one to observe that finite verbs that appear in the second position of the clause must be interpreted in their clause-final base position in order to comply with well-accepted principles of grammar. He also pointed out that this reconstruction of the finite verb into its base position should be reflected in on-line sentence comprehension. In the tradition of generative grammar such a discrepancy between surface position and underlying interpretation appears very commonly. In the realm of on-line processing, however, this assumption becomes highly significant. Not so much because of the general idea that an element is (re-)interpreted at a distance – a mechanism which is well-accepted for nominal elements in so-called *filler-gap dependencies* – but because the deviation from strict left-to-right processing involves the core element of the clause, the finite verb, which specifies the argument structure, event type, etc. It is hard to believe that the human language processor would not make use of such central information although it is available. This dissertation presents a critical investigation of this *V2-Reconstruction Hypothesis* and the consequences for V2-structures. It focuses mainly on German but connections to other V2-languages are made throughout the thesis. The investigations are carried out on three linguistic areas: grammar, processing and language acquisition. Accordingly, the dissertation is divided into three major parts. In the following, I give a brief outlook of the content of the individual chapters.

Chapter 2 provides the general background for the investigation of the V2-phenomenon by illustrating its three main properties: First, V2-order constitutes a movement dependency between the base position of the verb and the V2-position. Second, V2-movement applies exceptionless, i. e. it cannot be suspended. Third, V2-movement targets one specific position in the left periphery of the clause. The chapter closes with a brief summary of the most important analyses of the V2-phenomenon.

Chapter 3 introduces the basic assumption of what builds the core of this dissertation, i. e. the V2-Reconstruction Hypothesis. It states that V2-movement targets only the finiteness

features of the finite verb, which are represented by inflectional affixes. The lexical part of the verb only moves along because the affixes cannot move on their own. As a consequence, the lexical part has to be reconstructed into its clause-final base position where it is interpreted. Two groups of evidence are presented in support of the V2-Reconstruction Hypothesis: First, I show that the V2-position is systematically filled with surface elements which must not be interpreted and second, I present evidence which indicates that the finite verb has to be interpreted in its base position.

Chapter 4 provides the general background for the experimental investigations by introducing the basic properties of on-line language comprehension with a focus on the syntactic domain. I argue that deviation from strictly incremental processing, as assumed by the V2-Reconstruction Hypothesis, occurs regularly and results in one of two different processing strategies: anticipatory analysis with potential subsequent repairs, or delayed processing. A comparison with well-established manifestations of these two strategies indicates that V2-clauses adhere to delayed processing, as assumed under the V2-Reconstruction Hypothesis.

Chapter 5 provides more specific background for the experimental investigation by reviewing previous findings regarding the processing of the core argument structure in German sentences. Additionally, I review on-line processing experiments on thematic structure, attachment ambiguities and scope computing in German the results of which suggest that verb-related effects only appear at the clause-final position, as predicted by the V2-Reconstruction Hypothesis.

Chapter 6 presents four self-paced reading experiments that test predictions of the V2-Reconstruction Hypothesis concerning on-line sentence processing. The experiments use three different phenomena, NPI-licensing, infinitive selection and thematic-role assignment, to detect the temporal profile of the processing influence of the V2-element. Grammaticality contrasts that are dependent on the interpretation of the finite verb in V2-position show up at the reconstruction site of the verb conforming to the predictions of the V2-Reconstruction Hypothesis.

In Chapter 7, I examine three details of the reconstruction process: First, the special status of subject-initial V2-clauses might be attributable to a more efficient processing route. Second, I argue that verb reconstruction is realized by inserting incoming units directly before the verb, instead of cascadically lowering the verb. Third, I argue that once unambiguous cues for the clause-final base position are encountered, the parse is completed and the core meaning cannot be altered again, as evidenced by restrictions on extraposition.

Chapter 8 reviews the most important findings about the L1-acquisition of V2-order, which provides further support for the analysis of the previous chapters. In the early stages, children only produce basic word order patterns before V2-movement is developed with the realization of finiteness. During a short period of time a double pronunciation of the finite verb is observable, in the V2-position and in the base position. The observations are summarized in a 3-stage grammar model.

Chapter 9 summarizes findings about V2-related L2-acquisition of German. Transfer effects from the learners' L1-grammar and the stepwise development of the interlanguage grammar are the main characteristics to account for typical word-order error-patterns.

In Chapter 10, I present four psycholinguistic experiments which investigate the mastering as well as the characteristic error patterns of German word order by L2-learners. The L2-

learners were recruited from 4 different groups, differing in L2-proficiency and the basic word order patterns of the participants' L1 to obtain results concerning the developmental path and influence of the available parsing routines. The results indicate that the development of L2-parsing routines follows the grammar models of L2-acquisition. Additionally, the results show that there are specific parsing-related profiles, such as verb-doubling patterns being restricted to low-proficient OV-learners, that go in parallel with L1-acquisition.

Chapter 11 summarizes the findings of the dissertation. The summary also provides conclusions and open questions for the individual parts and the dissertation as a whole.

Part I

The grammatical perspective on V2-movement

2 The Syntax of V2

The basis of the verb second phenomenon can be informally described as in (1).

(1) **Description of the verbs second linearization:**
In V2-clauses, the finite verb occupies the second position of the clause.

Obviously, the situation is a little more complicated. The V2-phenomenon can be divided into three core issues: The position of the finite verb, specifying the preverbal element(s) and explaining its root character. The first two issues will be addressed in this chapter. The third one can only be touched because it is a complex topic on its own and not central to the issues in the following chapters of this dissertation.

The first section will discuss the core phenomenon and also some cases in which the V2-requirement conflicts with other areas of the grammar. Section 2.2 shows that, due to discourse-pragmatic reasons, sentences may actually show reduced or extended V2-structures. The data in the first two sections is presented with as little theoretical assumptions as possible because these are the empirical observations that must be covered by all syntactic theories. Only in Section 2.3 will I discuss analyses of the generative grammar tradition and highlight the explanatory benefit of the respective accounts.

2.1 Observations: The facts about V2

In this section, I present the basic observations regarding word order regularities in German, representative for V2-languages in general. This is followed by more elaborate discussion of cases in which finite verbs cannot move into the V2-position (Section 2.1.3) and elements that cannot precede the finite verb in V2-clauses (Section 2.1.4). The discussion will show that the regularities of V2 are never suspended but may conflict with other grammatical restrictions.

2.1.1 The core cases: V2, V1 and V-final

V2-order can be best illustrated with declarative and *wh*-interrogative clauses, as in (2) and (3). Either one of the clausal constituents may precede the finite verb, such as the subject in (2a), the object in (2b), or the adverb in (2c). The same holds for the corresponding *wh*-interrogatives in (3).

(2) Declaratives

a. Der Junge hat gestern den Kuchen gegessen.
the boy has yesterday the cake eaten
'The boy has eaten the cake yesterday.'

b. Den Kuchen hat der Junge gestern gegessen.
the cake has the boy yesterday eaten
'The boy has eaten the cake yesterday.'

c. Gestern hat der Junge den Kuchen gegessen.
yesterday has the boy the cake eaten
'Yesterday, the boy has eaten the cake.'

(3) *Wh*-interrogatives

a. Was hat der Junge gestern gegessen?
what has the boy yesterday eaten
'What did the boy eat yesterday?'

b. Wer hat gestern den Kuchen gegessen?
who has yesterday the cake eaten
'Who ate the cake yesterday?'

c. Wann hat der Junge den Kuchen gegessen?
when has the boy the cake eaten
'When did the boy eat the cake?'

Two other core sentence types, polar interrogative and imperative rather show V1-patterns with the finite verb in sentence-initial position, as in (4) and (5).[1]

(4) Polar interrogatives

a. Hat der Junge gestern den Kuchen gegessen?
has the boy yesterday the cake eaten
'Did the boy eat the cake yesterday?'

b. # Der Junge hat gestern den Kuchen gegessen?
the boy has yesterday the cake eaten

c. # Gestern hat der Junge den Kuchen gegessen?
yesterday has the boy the cake eaten

d. # Den Kuchen hat der Junge gestern gegessen?
the cake has the boy yesterday eaten

(5) Imperatives

a. Iss heute den Kuchen!
eat today the cake
'Eat the cake today!'

b. * Den Kuchen iss heute!
the cake eat today

[1] The sentences in (4b–4d) are syntactically well-formed strings and may even receive an interrogative interpretation. However, these are so-called *declarative questions* that have to be differentiated from true polar interrogatives because they require a very specific utterance context (see Gunlogson 2002, Truckenbrodt 2006a: 259).

c. * Heute iss den Kuchen!
today eat the cake

In subordinate clauses, the finite verb appears only in the clause-final position and not in the corresponding V2/V1-positions, as illustrated in (6).[2]

(6) a. Es it gut, dass der Junge ⟨*hat⟩ gestern den Kuchen gegessen ⟨hat⟩.
it is good that the boy has yesterday the cake eaten has
'It is good that the boy ate the cake yesterday.'

b. Es ist klar, was ⟨*hat⟩ der Junge gestern gegessen ⟨hat⟩.
It is clear what has the boy yesterday eaten has
'It is clear what the boy ate yesterday.'

c. Es ist unklar, ob ⟨*hat⟩ der Junge ⟨*hat⟩ gestern den Kuchen gegessen ⟨hat⟩.
it is unclear whether has the boy has yesterday the cake eaten has
'It is unclear whether the boy ate the cake yesterday.'

This short descriptive sample suffices to conclude that the verb position in German (and other V2-languages) is clause type specific. We observe a major difference between main and subordinate clauses: In subordinate clauses, the finite verb appears uniformly in the clause-final position. In main clauses, the verb appears always in the left periphery, either in first or second position. In German linguistics, these two verb positions are taken to be the anchor points for a descriptive model that divides the sentences into three fields (Drach 1937): The slot preceding the finite verb in V1/V2-clauses is called the prefield, the slot between the finite verb and the non-finite verbs in V1/V2-clauses is called the middle field, and the slot following the right-peripheral verbal element in main and embedded clauses is called the postfield. In the following, I will refer to these fields descriptively in order to avoid specific syntactic analysis, before discussing those in Section 2.3.

(7)

prefield	**V2**	**middle field**	**non-finite verb**	**postfield**
Gestern	hat	der Junge den Kuchen	gegessen,	nachdem …
Yesterday	has	the boy the cake	eaten	after …

2.1.2 The prefield: What precedes the finite verb?

Above, we have already seen that the second position is not defined in terms of morphological words but in terms of syntactic constituents, which is also illustrated in (8). The object precedes the finite verb, irrespective of its length.

(8) [Den (mit Schkolade überzogenen) Kuchen] hat der Junge gestern gegessen.
the with chocolate covered cake has the boy yesterday eaten
'The boy ate the (with chocolate covered) cake yesterday.'

[2] I will exclude the discussion of embedded V2-clauses because that phenomenon is still discussed controversially and does, as far as I can see, not contribute anything relevant to the central objective of this dissertation, the processing of V2. The interested reader is referred to Heycock (2006) and Freywald (2014).

Consequently, also larger constituents such as VPs and subordinate clauses may occupy the prefield, as is shown in (9).

(9) a. [Gestern den Kuchen gegessen] hat der Junge (sicherlich nicht).
yesterday the cake eaten has the boy surely not
'Yesterday, the boy did definitely not eat the cake.'

b. [Weil er Hunger hatte] hat der Junge gestern den Kuchen gegessen.
because he hunger had has the boy yesterday the cake eaten
'The boy ate the cake yesterday because he was hungry.'

In Section 2.1.4, I will discuss restrictions on prefield elements. Some specific forms of complex prefields are presented in Section 2.2.3.

2.1.3 Restrictions on V2-movement

The most robust restriction on V2-movement is a corollary of the V2-generalization: Only finite verbs move, non-finite verbs do not. This restriction appears to be inviolable. Even though German exhibits a range of non-finite matrix clause constructions, as discussed in Gärtner (2013), none of these show a non-finite verb in V2-position. Therefore we may conclude that being some kind of independent clause is not sufficient to trigger verb movement. A necessary requirement for V2-movement is finiteness.

Among the finite clauses, two different restrictions on V2-movement have been observed: An external restriction in which the finite verb is 'trapped' within the surface scope of a comparative operator and cannot be moved. Second, an internal restriction: Complex lexemes with more than one particle attached to the base exhibit a morphological structure that leads to a dilemmatic conflict of morphosyntactic well-formedness conditions under verb movement.

External constraint: Configurational restrictions in scope taking comparative operators

Haider (2010: 64–65) observed that verbs which are the target of an adverbial comparison operator cannot move out of the surface scope of such an operator. The verb *verdreifachen* 'triple' is perfectly acceptable as a finite verb in the V-final embedded clause in (10a), and as a participle in the main clause in (10b), irrespective of the presence of the comparative adverbial *mehr als* 'more than'. However, if the verb leaves the surface scope of the comparative operator the structure becomes ungrammatical, irrespective of whether the movement targets the V2-position, as in (10c), or the prefield as in (10d). Additionally, example (10e) shows that movement of the verb is not banned per se. If the comparative operator is topicalized together with the verb, the structure is completely acceptable. The same results are obtained for the equative operator *so gut wie* (*verdoppelt*) 'as much as (doubled)' (Haider 2010: 65).

(10) German

a. … dass sich der Verlust (mehr als) verdreifachte (soweit ich das beurteilen kann)
that itself the deficit more than tripled insofar I that assess can

b. Dann hat sich der Verlust (mehr als) verdreifacht ~~hat~~ (soweit ich das beurteilen
then has itself the deficit more than tripled insofar I that assess
kann).
can

c. Dann verdreifachte sich der Verlust (*mehr als) ~~verdreifachte~~ (soweit ich das
then tripled itself the deficit more than insofar I that
beurteilen kann).
assess can

d. Verdreifacht hat sich der Verlust (*mehr als) ~~verdreifacht~~ ~~hat~~ (soweit ich das
tripled has itself the deficit more than insofar I that
beurteilen kann)
assess can

e. [Mehr als verdreifacht] hat sich der Verlust ~~mehr als verdreifacht~~ ~~hat~~ (soweit
more than tripled has itself the deficit insofar
ich das beurteilen kann).
I that assess can

'The deficit has more than tripled, at least as far as I can tell'

A cross-lingustic comparison shows that such comparative structures are movement-phobic also in other, non-V2 languages. The English and Italian paradigms in (11) and (12), respectively, show exactly the same pattern as their German equivalents. As soon as the target of comparison is not within the scope domain of the operator in the surface form, the structure is ungrammatical. Example (11a) shows that a verb like *triple* is fine in the surface scope of an operator like *more than*. (11b) shows that a verb may be fronted, but fronting out of the operator scope in (11c) is deviant.

(11) English

a. The value (has) [far more than merely tripled].

b. (He said that the value would triple, and) tripled$_1$ the value has indeed ~~trippled~~$_1$ within one week.

c. * (He said that the value would more than triple, and) tripled$_1$ the value has indeed [more than ~~tripled~~$_1$] within one week.

(Haider 2000b: 159, Haider 2010: 64)

Example (12a) presents a similar configuration with the Italian verb *triplicare* "triple" in the scope of a comparative operator. Destroying the surface scope relation results in unacceptability irrespective of whether the verb is fronted as in (12b) or the operator phrase is moved as in (12c).

(12) Italian

a. Il valore si è [molto più che solo triplicato].
the value refl is much more than only tripled

b. *Il valore si triplica$_1$ [molto più che solo ~~triplica~~$_1$].
the value refl tripled much more than only

c. *Il valore [molto più che solo]$_1$ si ~~molto più che solo$_1$~~ triplica.
The value much more than only REFL tripled
(Haider 2000b: 159)

Additional support for the assumption that this ban is specific to the comparative environment can be obtained from the inspection of comparative constructions involving non-verbal elements, as illustrated for adjectives in (13), for adverbials in (14), and for DPs[3] in (15).

(13) a. Dann war Christopher mehr als betrunken ~~war~~.
then was christopher more than drunk
'Then Christopher was more than drunk.'
b. Betrunken$_1$ war Christopher (*mehr als) ~~betrunken$_1$~~ ~~war~~.
drunk was Christopher more than
c. [Mehr als betrunken]$_1$ war Christopher ~~betrunken$_1$~~ ~~war~~.
more than drunk was Christopher

(14) a. Dann wird dieser Kurs mehr als doppelt gewertet ~~wird~~.
then will this course more than double valued
'Then this course will count more than double.'
b. Doppelt$_1$ wird dieser Kurs (*mehr als) ~~doppelt$_1$~~ gewertet ~~wird~~.
double will this course more than valued
c. [Mehr als doppelt]$_1$ wird dieser Kurs ~~mehr als doppelt$_1$~~ gewertet ~~wird~~.
more than double will this course valued

(15) a. Dann hat Christopher offensichtlich mehr als eine Mutter ~~hat~~.
then has Christopher obviously more than one mother
'Then Christopher has obviously more than one mother.'

[3] The comparison actually does not target the noun but the numeral. A variant exists that looks like a possible extraction case. However, the fronted noun must be in the plural, see (i.a). Example (i.b) shows that the plural noun cannot originate in the position following the numeral *eine* 'one'. Example (i.c) shows that the plural stems from a position directly following the comparator *mehr* 'more'. These comparative constructions seem to involve two instances of the lexeme MUTTER 'mother' of which maximally one can be spelled out, as illustrated in (i.d). Only the higher instance can be dislocated, the lower one has to remain in the operator scope even if it is not spelled out.

(i) a. *Mütter/ *Mutter hat Christopher offensichtlich mehr als eine.*
mothers mother has Christopher obviously more than one
b. *Dann hat Christopher offensichtlich mehr als eine *Mütter/ Mutter.*
Then has Christopher obviously more than one mothers mother
c. *Dann hat Christopher offensichtlich mehr Mütter als eine (*Mutter).*
then has Christopher obviously more mothers than one mother
d. *Mütter$_1$ hat Christopher offensichtlich mehr ~~Mütter$_1$~~ als eine ~~Mutter~~.*
mothers has Christopher obviously more that one mother
'Christopher has obviously more than one mother.'

b. [Eine Mutter]$_1$ hat Christopher offensichtlich (*mehr als) ~~eine Mutter$_1$~~ ~~hat~~.
one mother has Christopher obviously more than

c. [Mehr als eine Mutter]$_1$ hat Christopher offensichtlich ~~mehr als eine Mutter$_1$~~ ~~hat~~.
more than one mother has Christopher obviously

Thus there seems to be a cross-categorial and cross-linguistic restriction on extracting the target of comparison out of the surface scope of the comparative operator. This restriction is arguably so strong that it cannot be violated, not even by a fairly generalized movement operation such as V2-movement.

The following observation sheds some more light on this ban. I assume that the comparison operator is a focus-sensitive operator. The resulting configuration is therefore an *association with focus*-construction (see Section 3.3.1) in which the interpretation changes according to the focus-background structure, as illustrated in (16). The operator needs a focused constituent in its scope.

(16) a. Christopher hat sich mehr als (*nur*) [eín]$_{\text{FOC}}$ Auto gekauft. (mindestens zwei)
Christopher has REFL more than just one car bought
'Christopher bought more than just óne car. (At least two.)'

b. Christopher hat sich mehr als (*nur*) [ein Aúto]$_{\text{FOC}}$ gekauft. (Dieser Jaguar ist ein
Christopher has REFL more that just one car bought
Stück Zeitgeschichte)
'Christopher bough more than just a cár. (This Jaguar is a piece of history.)'

The ban on movement, therefore, can be reduced to a requirement of surface focus/accent marking. To demonstrate this, let us first look at the derived/metaphorical use of *mehr als* 'more than', as in (17). In (17a) the whole particle verb *anschreien* 'shout at' is in the surface scope of the operator. Hence, the alternatives to the predicate may include another predicate such as *schubsen* 'shove', as indicated in the continuation in (17a). In (17b), the verbal part is moved to the V2-position and only the particle remains in the surface scope position of the operator. Even though the verb meaning remains intact, the focus-sensitive operator operates on different semantic alternatives, as indicated by the continuations in (17b). A felicitous continuation can only refer to a more extreme alternative of a shouting event. An event of a different type, such as shoving, is excluded. This indicates that the surface element constitutes the basis for the computation of focus alternatives by the focus-sensitive operator *mehr als* 'more than'.

(17) a. Er hat ihn *mehr als* (*nur*) [án-geschrien]$_{\text{FOC}}$. (Er hat ihn mindestens geschubst)
he has him more than just at-shouted he has him at least shoved
'He has more than (just) shouted at him. (He has at least shoved him.)'

b. Er schreit ihn *mehr als* (*nur*) [án]$_{\text{FOC}}$ ~~schreit~~. (Er wird ihn #mindestens schubsen/
he shouts him more than just at he will him at least shove
regelrecht zusammen-brüllen)
downright together-shout
'He is more than (just) shouting AT him. (He will #at least shove him/downright shout him down.)'

Two predictions follow from the hypothesis that only the surface focus exponent is constitutive for focus-sensitive operators such as *mehr als* 'more than' to generate the relevant alternatives: First, the surface focus exponent must not be null. Second, a meaningful focus alternative to the surface focus exponent must exist. The first prediction is obviously borne out, as illustrated by examples (10)–(15) above. The consequences of the second prediction can be illustrated with idiomatic constructions such as the particle verb *anfangen* 'start' (lit. 'on-catch') in (18). If the whole verb occurs in the focus of the operator, as in (18a), the relevant alternatives depict events that are well beyond the starting point. If the verb is split up by V2-movement, as in (18b), the focus alternatives are computed only with respect to the particle. However, alternative particles do not lead to felicitous alternatives to the idiomatic meaning.

(18) a. Er hat *mehr als* (*nur*) [án-gefangen]$_{\text{FOC}}$. (Er ist schon beinahe fertig.)
He has more than just on-catched he is already almost done
'He has more than just started. (He's already almost done.)'

b. ??/* Er fängt *mehr als* (*nur*) [án]$_{\text{FOC}}$ ~~fängt~~. (#Er wird es auch beenden)
He catched more than just on he will it also finish

A similar observation can be made for the idiom *Süßholz raspeln* 'sweet-talk' (lit. 'rasp licorice') in (19). If the entire predicate complex is within the scope of the operator, as in (19a), the alternatives are generated with respect to the idiomatic meaning. In (19b), on the other hand, only the DP of the idiomatic predicate complex is within the surface scope of the operator. Hence, the focus alternatives range only over things that can be rasped, which do not constitute felicitous alternatives to the idiomatic meaning. Example (19c) shows that without the focus-sensitive operator *mehr als*, such predicates may be split by V2-movement without blocking the idiomatic meaning.

(19) a. Er hat mehr als (nur) [Süßholz geraspelt]$_{\text{FOC}}$ ~~hat~~. (Er hat sich richtig an sie
He has more than just licorice rasped he has himself actually at her
rangeschmissen.)
at-thrown
'He has more than just sweet-talked. (He actually flinged himself at her.)'

b. Er raspelte mehr als (nur) [Süßholz]$_{\text{FOC}}$ ~~raspelte~~. (#Er hat sich richtig an sie
he rasped more that just licorice he has himself actually at her
rangeschmissen.)
at-thrown
'He rasped more than just licorice. (#He actually flinged himself at her.)'

c. Er raspelte (schon den ganzen Tag) Süßholz ~~raspelte~~ (um die alte Dame zum
he rasped already the whole day licorice for the old lady to the
Verkauf zu bewegen).
sale to persuade
'He has been sweet-talking the whole day to persuade the old lady to sell.'

This discussion showed that the restriction on movement out of the surface scope of operators such as *mehr als* 'more than' is so general that it applies to all syntactic categories. Second, the restriction is not a general ban on movement: Movement of a part of the predicate, such as the verbal stem of the particle verb in (17b), is possible. Third, the restriction only excludes movement of the whole focus exponent or parts of a non-compositional element because no meaningful alternatives can be computed for empty elements or non-compositional parts. In essence, even though V2-movement is constrained by this restriction, it is not V2-specific.

Internal constraint: Morphological dilemmas of complex verbs

Two different classes of *immobile verbs* can be distinguished in German (and Dutch). These are double-particle verbs and back-transformations. In contrast to the examples of the previous section, the constraint on movement arises from the internal (morphological) structure of the respective predicates. Both classes involve a *morphological* dilemma because the relevant verbs cannot be split up and cannot move as a whole (Haider 1993: 65).

In V2-contexts, German particle verbs split the verbal stem from the particle. The finite verbal part moves to the V2-position and the particle remains behind, as illustrated in (20).

(20) *an-kündigen* 'announce' (lit. 'on-announce')

a. ... dass du uns ankündigst
that you uns on.announce
'... that you announce us'

b. Du kündigst$_1$ uns an-t$_1$.
you announce us on
'You announce us.'

c. *Du ankündigst$_1$ uns t$_1$.
you on.announce us

There are a few particles, such as *vor* 'before' that combine productively with verbs, even with verbs which are already particle verbs. The result is a double particle verb with two adjacent particles, such as *vor-an-kündigen* 'pre-announce' in (21a). These verbs induce a dilemma in V2-environments: The verb cannot move alone, leaving behind both particles (21b), nor can any of the particles move with the verb (21c–21d), nor can both particles move with the verb (21e), nor can the V2-constraint be ignored and the verb remain in-situ (21f) (Haider 2010: 58–61).

(21) a. … wenn du uns vorankündigst.
if you us pre-announce
'… if you pre-announce us.'
b. * Du kündigst$_1$ uns voran~~kündigst~~$_1$.
c. * Du ankündigst$_1$ uns vor~~ankündigst~~$_1$.
d. * Du vorkündigst$_1$ uns ~~vorankündigst~~$_1$.
e. * Du vorankündigst$_1$ uns ~~vorankündigst~~$_1$.
f. * Du uns vorankündigst.
(see Haider 2010: 60)

Haider (2010: 60–61) lists a number of other combinations to illustrate the productiveness of the pattern, see (22).

(22) a. vor + abdrucken → vorabdrucken 'preprint' (lit. 'pre-off-print')
b. vor + anmelden → voranmelden 'preregister' (lit. 'pre-an-nounce')
c. um + einteilen → umeinteilen 'reorganize' (lit. 're-in-deal')

Haider (2010: 61) also includes examples (23a) and (23b) featuring the initial particle *mit* 'with'. Such examples are exceptional because *mit* is a rather free particle which is located in the right periphery of the middle field (see Bücker 2012: 209-214 for a characterization).[4] The exceptional status is exemplified in (24), showing that *mit* can easily separate from the particle verb without giving rise to this dilemma.

(23) a. mit + einsteigen → miteinsteigen 'get on together' (lit. 'with-in-step')
b. mit + ausdrucken → mitausdrucken 'print out jointly' (lit. 'with-out-print')

(24) a. Dann steigt doch einfach mit-ein~~steigt~~.
then step PRT simply with-in
'Then simply get on together (with the others).'
b. Andrea druckt mir das bereits mit-aus~~druckt~~.
Andrea prints for me that already with-out
'Andrea prints this already for me (jointly with her stuff).'

Moreover, *mit* 'with' may also attach to doubly prefixed verbs as shown in (25). As expected, the resulting complex is unproblematic in V-final position as in (25a), but results in the same dilemmatic situation in (25b) as the doubly prefixed verb alone. Additionally, *mit* must always be the leftmost particle in such constructions.[5]

[4] Sebstian Bücking (p. c.) made me aware of this with his talk at the Universität zu Köln, 10 January 2018.

[5] If the meaning allows it, the particle *mit* may occur two times, as in (i), even though this construction is marked because the simpler form with only one *mit* would suffice in this case.

(i) *Wenn du eh schon zum Kiosk gehst, kannst du mir dann auch noch was mit-mitbringen?*
if you PRT already to the kiosk go can you me then also something with-with.bring
'If you are going to the kiosk anyway, could you bring also something for me?'

(25) mit + voranmelden 'jointly preregister' (lit. 'with-pre-announce')

a. Kannst du mich morgen bitte mit-voranmelden? Ich hab keine Zeit.
can you me tomorrow plaese with.pre.an.nounce I have no time
'Can you preregister for me too tomorrow? I don't have time.'

b. * Meldest du mich morgen bitte mit-voran? Ich hab keine Zeit.
nonce you me tomorrow plaese with-pre.an I have no time
'Can you preregister for me too tomorrow? I don't have time.'

I cannot think of a plausible reason why the movement of the finite verb stem should be constraint directly. An explanation of this immobility must rather focus on the clause-final position: Somehow it seems possible to strand one verbal particle alone, but not two particles together (Haider 2010). Clearly, this account remains rather descriptive, which, however, suffices for now.

The second class of verbs, *pseudo-compounds*, shows a very similar pattern (Freywald & Simon 2007).[6] All of these lexemes have a verbal head, the rightmost constituent in German. The first constituent can be of various categories, as shown in (26). The examples illustrate that the verbal lexemes are derived from nominal forms that contained a deverbal head. This modified head is back-transformed[7], which results in a complex verb.

(26) a. N+V
Gen+manipulation → genmanipulieren
gene+manipulation gene.manipulate
'genetic engineering' → 'do genetic engineering'

b. V+V
Mäh+drescher → mähdreschen
mow+thresher mow.thresh
'harvester' → 'use the harvester'

c. A+V
Erst+wähler → erstwählen
first+voter first.vote
'first-time voter' → 'vote for the first time'

d. P+V
Zwischen+landung → zwischenlanden
between+landing between.land
'stopover' → 'stop over'

(Freywald & Simon 2007: 2–3)

However, as illustrated in (27), not all back-transformed verbs are immobile (Fortmann 2007).

[6] An observation that dates back to Höhle (2018: 370–372).

[7] Freywald & Simon (2007) differentiate between *back-conversion* and back-transformation. The only difference is that in conversion no affix is added or removed.

(27) a. Theo gewährleistet seine pünktliche Ankunft.
Theo warranty+supplies his punctual arrival
'Theo ensures his punctual arrival.'

b. Eberhardt handhabt Messer und Gabel mit einigem Geschick.
Eberhardt hand+has knive and fork with considerable skill
'Eberhardt handles knive and fork with considerable skill.'

c. Man schlussfolgert oft das Falsche.
one conclusion+deduce often the wrong
'One often reaches the wrong conclusion.'

(Fortmann 2007: 9)

Moreover, Freywald & Simon (2007) present results from a questionnaire study indicating that some of the alleged immobile verbs are not categorically refused by native speakers. Some of them are rated almost as good as the *unproblematic* clause-final variants. Additionally, the decision concerning the (non-)separability of the two constituents of the pseudo-compound seems to be influenced by the category of the first constituent. Prepositions, as in (26d), are more likely to be separated and remain in the clause-final bases position. This is not surprising, considering that the particles of most classical particle verbs are at least homophone variants of prepositions.[8] Furthermore, Freywald & Simon (2007) report that their participants divide into two groups, one accepting back-transformations in V2-contexts and others do not. It seems plausible that the speaker community establishes an acceptance for some verbs, as the ones in (27), over time.

Therefore, the immobility of pseudo-compounds can be reduced to the assumption that the lexical entry of the verbs in question is somewhat defective, which only surfaces when the speaker has to make a decision about separating the verb stem from the modification or not. It also appears possible that lexemes that are currently immobile become mobile in the future.

Comparable cases of immobility of the finite verb due to multiple particle prefixing and back-transformation are also observed in Dutch (Booij 1990, Koopman 1995). However, Vikner (2005) points out that immobile complex verbs are non-existent in Danish despite Danish being a V2-language. He argues that such immobility only occurs in OV-languages like Dutch and German. Vikner (2005) attributes this difference between VO and OV languages to the linearization differences of the resulting phrases. In German and Dutch, particle verbs and back-transformation exhibit a head-final structure, [PRT≺V] and [N≺V], because the VP and noun composition is head-final. In Danish, noun composition is also head-final resulting in [N≺V]-structured back-transformations. Danish particle verbs, on

[8] The verb *teilnehmen* 'partake' (lit. part+take) seems to be a case in point that most probably results from a back-transformation. Splitting the nominal part, as illustrated in (i), is completely unmarked.

(i) *Er nahm an der Veranstaltung teil~~nahm~~.*
he took at the event part
'He partook in the event.'

the other hand, show a [V≺PRT] pattern due to the VP being head-initial. Interestingly, however, double-particle verbs in Danish show a [PRT≺PRT≺V] order, which resembles the linearization of noun composition (including back-transformation) and distinguishes double-particle verbs formally from particle verbs. The head-final complexes, back-transformation and double-particle verbs therefore form an inseparable word that moves always as a whole. In V2-contexts, normal particle verbs in Danish split up but retain their relative order (V≺PRT), in contrast to German and Dutch. In conclusion it seems that in OV-languages like German and Dutch, the uncertainty of the morphological status is caused by the form identity of the output of morphological and syntactic processes in these languages.[9]

In sum, internal constraints on V2-movement have been identified as conditions on the morphological form, which can be paraphrased as follows: V2-movement is not restricted but the outcome may violate constraints on the morphological representation. We have seen that back-transformations are not categorically excluded from V2-movement and may show each of the two options, movement as a complex or splitting up. Furthermore, it can be expected that the status of back-transformed lexemes changes over time and "develops" unmarked mobility. The comparison with Dutch as another OV-language and Danish as an VO-type V2-language suggested that the OV-property is an important factor for the phenomenon of immobile verbs. In comparison to the generalized ban on movement in the comparative configuration, which was discussed in the previous section, the problems of this section are specifically tied to V2-movement: The separation of verbal parts and particles arises only under head movement. Movement of non-finite forms into the prefield are fine, as shown in (28).

(28) a. Voranmelden kannst du dich ja trotzdem ~~voranmelden~~ ~~kannst~~.
preannounce can you yourself PRT anyway
'You could preannounce yourself anyway.'

b. Genmanipulieren dürfen wir nur wenige Planzen ~~genmanipulieren~~ ~~dürfen~~.
do genetic engineering may we only few plants
'We are allowed to do genetic engineering only with few plants.'

Summary

I presented two types of restrictions on verb movement, an external and an internal constraint. The external constraint is a generalized ban on moving elements out of a comparative construction if the result is an exponent that does allow the computation of meaningful focus alternatives. This restriction turned out to be not V2-specific because it applies to phrasal movement and head movement alike, applies to other syntactic categories apart from verbs, and is also observed in non-V2 languages. The internal constraint is a specific consequence of applying head movement to double-particle verbs and back-transformations. Such movement leads to separation of the verbal part, stranding the remaining part in the V-final base

[9] Following the structure building account of Haider (2012), modification of head-initial phrases is restricted to a single element whereas the modification of head-final phrases is basically unbounded. Multiple-particle verbs are therefore excluded in verb-initial languages.

position. This (non-)separation may lead to conflicts of morphological requirements thereby rendering the output of the head movement unacceptable. Such conflicts seem only to arise in V2-languages of the OV-type like German and Dutch.

I conclude that V2-movement is generalized movement. In some cases its application can conflict with well-formedness conditions of other grammatical areas. Crucially, however, V2-movement cannot be suspended in those cases. Instead speakers are forced to insert an auxiliary to avoid movement of the problematic element, as in (29b). In any case they can never use the finite verb in the clause-final base position of the matrix clause, as in (29c).

(29) a. ?/??/* Wir genmanipulieren diese Pflanze ~~genmanipulieren~~.
we genetic engineer this plant
'We modify this plant by genetic engineering'

b. Wir haben diese Pflanze genmanipuliert ~~haben~~.
we have this plant genetic engineered
'We modified this plant by genetic engineering'

c. * Wir diese Pflanze genmanipulieren.
we this plant genetic engineer
'We modify this plant by genetic engineering'

2.1.4 Restrictions on prefield elements

Above, I stated that any phrasal element may occupy the prefield. This generalization has to be qualified in two ways. In this section, I will show that some phrasal elements may not occupy the prefield, which seems to be subject to cross-linguistic variation. Cases in which apparent non-phrasal elements occur in the prefield will discussed in Section 2.2.

Negation

In German, negation is excluded from topicalization, as shown in (30a). It can only appear in the prefield as part of a larger constituent such as the VP, as in (30b).

(30) Christopher hat das Buch nicht gelesen.
Christopher has the book not read
'Christopher hasn't read the book.'

a. *Nicht$_1$ hat Christopher das Buch ~~nicht~~$_1$ gelesen.
not has Christopher the book read

b. [Das Buch nicht gelesen]$_1$ hat (nur) Christopher ~~das Buch nicht gelesen~~$_1$.
the book not read has only Christopher
'(Only) Christopher didn't read the book.'

Cross-lingustic comparison indicates that negation is not generally excluded from the sentence-initial position in V2-languages. In Swedish, negation can appear in preverbal position in declarative rejections, as in (31b), and in rejection questions, as in (32b). The difference

in the felicity conditions between the unmarked position of the negation and the preverbal occurrence is far from trivial and the reader is referred to Seeliger (2015). Fronting of the negation is also possible in Icelandic, Norwegian, and Breton (Holmberg 2015: 350).

(31) Swedish: Rejections

a. Han kommer inte till mötet.
he comes not to the.meeting
'He isn't coming to the meeting.'

b. Inte kommer han till mötet.
Not comes he to the.meeting
'He isn't coming to the meeting.'

(Seeliger 2015: 576)

(32) Swedish: Rejecting questions

a. Han kommer inte till mötet?
He comes not to the.meeting
'Surely he isn't coming to the meeting?'

b. Inte kommer han till mötet?
Not comes he to the.meeting
'Surely he isn't coming to the meeting?'

(Seeliger 2015: 576–577)

Zeijlstra (2013) discusses two constructions in Dutch in which the negation can be topicalized, as shown in (33).[10]

(33) Dutch

a. Ik had wel gezien dat Jan aankwam, maar niet$_1$ had ik ~~niet~~$_1$ gezien dat Eddy
I had prt seen that Jan arrived, but neg had I seen that Eddy
vertrok.
left
'I did see that Jan arrived, but I didn't see that Eddy left.'

b. Níet moeten in de lijst worden aangekruist de planten die je al hébt.
neg must in the list be crossed the plants that you already have
'You must not mark the plants on the list that you already have.'

(Zeijlstra 2013: 893–894)

In O'odham (Papago), an OV-V2 language, the negation can also fill the prefield and precede the auxiliary, as in (34b). Interestingly, in contrast to German[11], the non-finite verb cannot be placed into the prefield and precede the negation, as in (34c), whereas example

[10] Thanks to Heiko Seeliger (p. c.) for pointing that out.
[11] An acceptable German equivalent is given in (i).

(34d) shows that fronting the verb is fine, without (crossing) the negation (Zepeda 1983: 8–9).[12]

(34) O'ODHAM

a. ['I:da 'o'odham] 'o pi ñeok.
this person AUX NEG speaking
'This person is/was not speaking.'

b. Pi 'o 'i:da 'o'odham ñeok.
NEG AUX this person speaking
'This person is/was not speaking.'

c. *Ñeok 'o pi 'i:da 'o'odham .
speaking AUX NEG this person
'This person is/was not speaking.'

d. Ñeok 'o 'i:da 'o'odham.
speaking AUX this person
'This person is/was speaking.'

(Zepeda 1983: 8–9)

Three different explanations could cover these cross-linguistic differences: First, negation might be phrasal in some languages, such as Swedish and O'odham, whereas it is non-phrasal in others, such as German. This would allow to maintain the restriction that only phrasal elements occur in the prefield. Second, we might assume that negation is phrasal in all languages and there are independent reasons that restrict negation from being topicalized in German. Third, we might assume that negation is non-phrasal in all languages but there is a mechanism that exceptionally allows topicalization of these elements in languages such as Swedish and O'odham. I leave this open to future research but will come back to this issue in the summary below.

Discourse particles

Discourse particles in German cannot appear in the prefield (Zimmermann 2011: 2029, Bayer & Struckmeier 2017b: 7). This is illustrated for the discourse particles *wohl* and *doch* in (35a) and (35b). In contrast to negation, discourse particles do not move to the prefield as part of a larger unit either, as shown in (36).

(35) Christopher hat wohl/ doch seinem Vater zugehört.
Christopher has PRT PRT his father to-listen
'Christopher listened to his father.'

(i) *Gesprochen*$_1$ *hat diese Person nicht* ~~*gesprochen*~~$_1$.
spoken has this person not
'This person has not spoken.'

[12] It seems that the negation *pi* in O'odham has its base position right-adjacent to the second position auxiliary. Additionally, there seems to be a requirement that the negation must precede their target (see Zepeda 1983).

a. * Wohl hat Christopher ~~wohl~~ seinem Vater zugehört.
PRT has Christopher his father to-listen

b. * Doch hat Christopher ~~doch~~ seinem Vater zugehört.
PRT has Christopher his father to-listen

(36) a. * [Wohl/ Doch seinem Vater] hat Christopher ~~wohl/doch seinem Vater~~ zugehört.
PRT PRT his father has Christopher to-listen

b. * [Wohl/ Doch seinem Vater zugehört] hat Christopher ~~wohl/doch seinem Vater zugehört~~.
PRT PRT his father to-listen has Christopher

Many discourse particles have homophonous counterparts that indeed may occupy the sentence-initial position, as illustrated by the contrast of adverbial *vielleicht* 'perhaps' in (37) and the discourse particle in (38).

(37) *vielleicht* as an adverb

a. Renate ist vielleicht in die Oper gegangen
Renate is perhaps in the opera gone
'Perhaps, Renate went to the opera.'

b. Vielleicht ist Renate in die Oper gegangen.
perhaps is Renate in the opera gone
'Perhaps, Renate went to the opera.'

(Bayer & Struckmeier 2017b: 7, fn. 5)

(38) *vielleicht* as a discourse particle

a. Díe ist vielleicht eingebildet!
she is VIELLEICHT arrogant
'Boy, is shé arrogant!'

b. * Vielleicht ist díe eingebildet!
VIELLEICHT is she arrogant

(Bayer & Struckmeier 2017b: 7, fn. 5)

Zimmermann (2011: 2029) proposes that German discourse particles cannot appear in the prefield position because they cannot bear stress. This may explain why discourse particles do not appear in the prefield on their own but not why they cannot move as part of a larger phrase, as in (36). Additionally, in questions, discourse particles may be fronted along with the *wh*-expression, as in (39) (see Bayer & Trotzke 2015).

(39) a. Wer wohl ist zu spät gekommen?

b. Wie bloß konnte das passieren?

Furthermore, as Zimmermann (2011: 2031-2033) points out, discourse particles may appear in the left periphery in other languages, such as the Swedish particles *nog* and *visst* in (40) (see Scherf 2017).

(40) Swedish
Nog/ Visst läser Peter tidningen i köket.
nog visst reads Peter newspaper.def in kitchen.def
'Peter reads the newspaper in the kitchen.' (Scherf 2017: 80)

In sum, discourse particles are heavily restricted in their occurrence in the prefield. A possible explanation has been their inability to bear stress. Concerning the cross-linguistic variation it seems not clear if their distribution is due to their phrase structural status, i. e. being a head vs. a phrase.

Verbal particles

It is a well-known fact about German and Dutch that particle verbs may split up in V2-environments, moving the finite verb stem into the V2-position and leaving the particle behind, as shown in (41a) vs. (41b). Fronting the particle verb as a whole, as in (41c), is unproblematic, whereas fronting only the particle, as in (41d), is degraded.

(41) a. … dass der Vater das Buch vorliest.
that the father the book reads out
'… that the father reads out the book.'

b. Der Vater liest das Buch vor~~liest~~.
the father reads the book out
'The father reads out the book.'

c. Vorgelesen$_2$ hat$_1$ der Vater das Buch ~~vorgelesen~~$_2$ ~~hat~~$_1$.
read out has the father the book
'The father read out the book.'

d. * Vor$_2$ hat$_1$ der Vater das Buch ~~vor~~$_2$gelesen ~~hat~~$_1$.
out has the father the book read

However, as has been noted by Frey (2004) and discussed by Trotzke & Quaglia (2016) and Trotzke & Wittenberg (2017), some particle verbs allow an emphatic topicalization of the particle, as shown in (42).

(42) a. Rúnter hat sein Chef ihn vor allen Kollegen gemacht!
prt(down) has his boss him in front of all colleagues made
'His boss put him down/heavily criticized him in front of all his colleagues.' (Trotzke & Quaglia 2016: 118)

b. Áuf hat Otto die Türe gemacht.
prt(open) has Otto the door made
'Otto opened the door.' (Frey 2004: 32)

Trotzke & Quaglia (2016) argue that the ability to contrast the fronted particle with an alternative particle plays an important role in understanding this restriction.[13] In other words, it

[13] See also the discussion of examples (17b) and (18b) above.

seems that it is not the syntactic properties that condition the fronting of the verbal particles but the pragmatic properties that are related to the prefield position.

Weak pronouns and expletives

In German, the prefield can be filled by a semantically empty expletive *es* 'there', which is form identical to the neuter pronoun *es* 'it'. The paradigm in (43) illustrates that the expletive can only appear in sentence-initial position, as in (43a), but not in the middle field, i. e. to the right of the V2-position, as in (43b–43d), or after the complementizer, as in (43e), (den Besten 1983: 66–69, Tomaselli 1986, Speyer 2009).

(43) a. Es kann nur eine Konstituente vor dem finiten Verb stehen.
EXPL can only one constituent before the finite verb stand
'Only one constituent may appear in front of the finite verb.'

b. Nur eine Konstituente kann (*es) vor dem finiten Verb stehen.
only one constituent can EXPL before the finite verb stand
'Only one constituent may appear in front of the finite verb.'

c. Wo kann (*es) nur eine Konstituente stehen?
where can EXPL only one constituent stand
'Where does only one constituent may appear?'

d. Kann (*es) nur eine Konstituente vor dem finiten Verb stehen?
can EXPL only one constituent before the finite verb stand
'Does only one constituent may appear in front of the finite verb?'

e. … dass (*es) nur eine Konstituente vor dem finiten Verb stehen kann.
that EXPL only one constituent before the finite verb stand
'… that only one constituent may appear in front of the finite verb.'

The neuter pronoun *es* 'it' frequently appears in the prefield if it represents the subject of the main clause verb, irrespective of whether it is a non-referring element such as the subject of *weather*-verbs in (44) or a referential subject as in (45). The variants in (44b) and (45b) illustrate that these elements may appear in the middle field as well, in contrast to the prefield expletive.

(44) a. Es hat gestern geschneit.
it has yesterday snowed
'Yesterday, it snowed.'

b. Gestern hat es geschneit.
yesterday has it snowed
'Yesterday, it snowed.'

(45) a. Es hat auf dem Tisch gelegen.
it has on the table laid
'It laid on the table.'

b. Auf dem Tisch hat es gelegen.
on the table has it laid
'It laid on the table.'

However, it has been observed that the pronoun *es* may not appear in the prefield if it represents an object, as in (46a), whereas it is fine in the middle field as in (46b) (Travis 1991: 359).

(46) Gestern habe ich ein Buch gekauft.
'Yesterday, I bought a book.'
a. * Es hat mein Vater heute schon gelesen.
it has my father today already read
b. Mein Vater hat es heute schon gelesen.
my father has it today already read
'My father already read it today.'

Closer inspection, however, reveals that there are cases, such as (47), where object-*es* occurring in the prefield is perfectly acceptable (see Lenerz 1994: 162, Frey 2006b, Meinunger 2007).

(47) a. (Gestern bin ich erstmals ohnmächtig geworden.) Es hat zum Glück
yesterday am I for the first time unconscious become it has to the luck
niemand mitgekriegt.
nobody realized
'(Yesterday I fainted for the first time.) (Though) luckily, nobody realized it.'
b. (Wo kommt das Buch her?) Es muss doch jemand dahin gelegt haben.
where comes the book from it must PRT someone there put have
'(Where did this book come from?) Someone must have put it there.'
(Meinunger 2007: 555–557)

That the occurrences of *es* are not cases of expletive prefield-*es* can easily be diagnosed by looking at the subordinate clause variants of (47b): As indicated in (48a), the pronoun cannot be left out in the middle field. Moreover, placing the object-*es* after the subject, as in (48b), results in markedness. I suspect that, in order to form a felicitous answer, the pronoun must receive stress, which it cannot. Replacing it by a stressed DP, as in (48c) is fine again.

(48) Wo kommt denn das Buch her?
Where comes PRT the book from
'Where did this book come from?'
a. Ich vermute, dass *(es) jemand dort verloren hat.
I suppose that it somebody there lost has
'Is suppose that somebody has lost it there.'

b. #Ich vermute, dass jemand es dort verloren hat.
I suppose that somebody it there lost has
'Is suppose that somebody has lost it there.'

c. Ich vermute, dass jemand das Búch dort verloren hat.
I suppose that somebody the book there lost has
'Is suppose that somebody has lost the book there.'

Meinunger (2007) observed that the crucial factor for the acceptability of object-*es* in the prefield is the specificity of the subject. With an indefinite unspecific subject as in (49a), object-*es* is fine but with a definite specific subject as in (49b), it is unacceptable and only the demonstrative *das* 'that' is acceptable.

(49) (Wo kommt das Buch her?)
where comes the book from
'Where did this book come from?'

a. Das/ Es muss jemand hier verloren haben.
that it must someone here lost have
'Someone must have lost that/it here.'

b. Das/ *Es muss der Professor hier verloren haben.
that it must the professor here lost have
'The professor must have lost that/it here.'

Similarly, other non-referential pronouns such as the lexical reflexives in (50) and (51) cannot appear in the prefield (see Speyer 2009: 325 fn. 2 and references therein).[14]

(50) a. Ich habe mich getäuscht/ geärgert.
I have REFL been mistaken been upset
'I was mistaken/upset.'

[14] Speyer (2009: 325 fn. 2) also claims that object-expletives are banned from the prefield. However, his contrast pair, given in (i.a) and (i.b), is ill-chosen because it features a specific subject. With an indefinite unspecific subject as in (i.c), the object-expletive is fine in the prefield, thereby paralleling the cases with referential object-*es* discussed above. Example (i.a) shows that the expletive is obligatory also in the middle field.

(i) a. *Karl hat *(es) eilig.*
Karl has it urgent
'Karl was in a hurry.'

b. * *Es hat Karl eilig.*
it has Karl urgent

c. *Es hatte niemand wirklich eilig*
it had no one really urgent
'No one was really in a hurry.'

d. *Niemand hatte *(es) wirklich eilig*
no one had it really urgent

b. * Mich habe ich geärgert/ getäuscht.
REFL have I been mistaken been upset

(51) a. Niemand hat sich das komplett angehört.
nobody has REFL that entirely listened to
'Nobody listened to that entirely.'

b. * Sich hat das niemand komplett angehört.
REFL has that nobody entirely listened to

Specific non-argumental dative elements (free datives/*Dativus ethicus*) are banned from the sentence-initial position too (Wöllstein-Leisten et al. 1997: 37). These datives are obligatorily realized by a weak pronoun (Mollica 2014: 353).

(52) a. Du bist mir ein Schlingel.
you are me.DAT a rascal
'You're such a rascal.'

b. * Mir bist du ein Schlingel.
me.DAT are you a rascal
(see Wöllstein-Leisten et al. 1997: 37)[15]

The same restriction is observed for a further class of pro-forms: Some verbs which take a clausal complements allow the insertion of the pro-form *es* 'it' or *das* 'that' in the matrix clause, as shown in (53a) and (54a).[16] In (53b), it seems as if the pro-form *es* could occupy the prefield. However, the unacceptability of (54b) and the impossibility of the pro-form *das* in the prefield position in (53c) and (54c) indicate that the *es* in (53b) must be analyzed as expletive prefield-*es*, the occurrence of which is known to depend on the lexical verb (cf. Speyer 2009).[17, 18]

[15] Wöllstein-Leisten et al. (1997) state that these datives may not appear in the prefield. Their example, given in (i.a), however, is somewhat confusing because they place the dative pronoun in sentence-initial position of an imperative clause. In imperatives, no constituent is allowed to precede the verb (except for heavy emphasis), as illustrated in (i.c) with the adverbial *heute* 'today'.

(i) a. * *Mir fall nicht hin*
me.DAT fall not down

b. *Fall mir (heute) nicht hin.*
fall me.DAT today not down
'Don't fall down (today).'

c. * *Heute fall mir nicht hin.*
today fall me.DAT not down

[16] Reis (1997) calls these pro-forms *Platzhalter-Korrelate* 'placeholder correlates'.

[17] Speyer (2009) takes it for granted that the prefield-*es* in clauses such as (53b) is coreferent with the embedded clauses without providing any diagnostic.

[18] Yvonne Viesel (p. c.) does not perceive the contrasts as unacceptable as indicated in (53) and (54). Moreover she provided example (i.a), which also sound very good to me. However, replacing *das* by *es* result in unacceptability, shown in (i.b), which indicates that the *es* is rather the prefield expletive than the pro-form of the embedded clause.

(53) a. Dem Vater ist es$_i$/ das$_i$ egal, [dass Christopher zu spät kommt]$_i$.
[the father]$_{DAT}$ is it that equal that Christopher to late comes
'The father doesn't care that Christopher is late.'

b. Es ist dem Vater egal, dass Christopher zu spät kommt.
It is [the father]$_{DAT}$ equal that Christopher to late comes
'The father doesn't care that Christopher is late.'

c. ??/* Das$_i$ ist dem Vater egal, [dass Christopher zu spät kommt]$_i$.
It is [the father]$_{DAT}$ equal that Christopher to late comes
'The father doesn't care that Christopher is late.'

(54) a. Der Vater hat es$_i$/ das$_i$ geahnt, [dass Christopher zu spät kommt]$_i$.
the father has it that suspected that Christopher to late comes
'The father suspected that Christopher will be late.'

b. ??/* Es hat der Vater geahnt, dass Christopher zu spät kommt.
it has the father suspected that Christopher to late comes
'The father suspected that Christopher will be late.'

c. ??/* Das hat der Vater geahnt, dass Christopher zu spät kommt.
that has the father suspected that Christopher to late comes
'The father suspected that Christopher will be late.'

The reason why all the above mentioned pro-forms cannot appear in the prefield is that they cannot be accented. Without being stressed, only pro-forms that are the highest elements in the middle field can occupy the prefield via an operation which Frey (2004) calls *formal movement*. This is the case for object-*es* with indefinite unspecific subjects. Lexical reflexive pronouns, free datives (Dativus ethicus) and the clausal pro-forms discussed above are never the highest elements of the middle field irrespective of the specificity of the subject. Hence, they can never appear in the prefield, where they must bear stress. Crucially, none of these can be stressed, which results in their ban from the prefield.[19] In essence, weak pronouns are banned from the prefield because the information structural properties of the prefield position require phonological marking in German, which cannot be realized by these elements for lexico-phonological reasons.

(i) a. *Das hab ich (doch) geahnt, dass Christopher wieder zu spät kommmt.*
that have I PRT suspected that Christopher again to late comes
'I have suspected that Christopher will be late again.'

b. * *Es hab ich (doch) geahnt, dass Christopher wieder zu spät kommmt.*

[19] The impossibility of carrying stress has been noted for weak referential pronouns (Travis 1991, Frey 2006b, Meinunger 2007), Dativus ethicus (Mollica 2014: 353), and clausal pro-forms (see Reis 1997: 131).

Qualificational adverbs

Some adverbials that express the degree to which the event depicted by the predicate holds are quite unacceptable in the prefield, as shown in (55)–(57).[20]

(55) a. Damals hat niemand dem Professor ríchtig zugehört
back then has no one the professor really listened to
'Back then, no one really listened to the professor.'

b. * Ríchig hat niemand dem Professor (damals) ~~ríchtig~~ zugehört
really has no one the professor back then listened to

(56) a. Gestern hast du deinen Bruder káum angeschaut.
yesterday have you your brother hardly looked at
'Yesterday you hardly looked at your brother.'

b. * Káum hast du deinen Bruder (gestern) ~~káum~~ angeschaut.
hardly have you your brother yesterday looked at

(57) a. Angeblich hat der Torwart dem Spieler vóll ins Gesicht geschlagen.
allegedly has the goalkeeper the player right in the face hit
'Allegedly, the goalie hit the player right in the face.'

b. * Vóll hat der Torwart dem Spieler (angeblich) ~~vóll~~ ins Gesicht geschlagen.
right has the goalkeeper the player allegedly in the face hit

The a-examples indicate that those adverbials can be accented in their base position in the middle field. At this time, I must leave open why these adverbs are resistant to topicalization.

VPs

VPs can be fronted quite easily in German. However, there seem to be language-specific restrictions among the V2-languages. In Icelandic, topicalization of the sole verb as well as a VP (verb plus object) is generally impossible (Thráinsson 2007: 344, 349).[21] Swedish allows VP-topicalization only for certain verb classes like eventives 'read a book' but not for statives like 'know Swedish' (Källgren & Prince 1989: 48–49).

A general observation is that VP-topicalization is heavily restricted if it targets the subject and the verb in intransitive structures and impossible if this leads to the exclusion of other arguments in (di-)transitive structures, in line with classic assumptions about constituency (see De Kuthy & Meurers 2003 for German and Bhatt 1994: 42–43 for Kashmiri). Additionally,

[20] Note that *kaum* can also be used as a temporal conjunction in the sense of 'shortly after', as which it can appear in the prefield as shown in (i). This reading is irrelevant here.

(i) *Kaum hast du deinen Bruder angeschaut, da gab es auch schon Streit.*
shortly after has you your brother looked at, then gave it also already trouble
'As soon as you looked at your brother, the trouble started.'

[21] Thanks to Jóhannes Gísli Jónsson (p. c.) for making me aware of this.

the subject included in a topicalized VP may not be definite and the middle field must not be empty (Wöllstein-Leisten et al. 1997: 103–104), as illustrated for the unaccusative *landen* 'land' in the examples in (58b) and (58c). The same contrast is also observable with the impersonal passive in (59) and the unergative verb in (60).

(58) a. … dass ein/ das Flugzeug gelandet ist.
that a the plane landed is
'… that a plane has landed'

b. * [Das Flugzeug gelandet] ist (auf dem roten Platz noch nie).
the plane landed is on the red square yet never

c. [Ein Flugzeug gelandet] ist *(auf dem roten Platz noch nie).
a plane landed is on the red square yet never
'No plane has ever landed on the Red Square yet.'

(see Haider 1988: 108–109)

(59) a. … dass ein/ das Flugzeug gesichtet wurde.
that a the plane sighted was
'that a plane was seen'

b. * [Das Flugzeug gesichtet] wurde (dort noch nie).
the plane sighted was there never yet

c. [Ein Flugzeug gesichtet] wurde *(dort noch nie).
a plane sighted was there never yet
'No plane was ever seen there yet.'

(see Haider 1988: 108–109)

(60) a. … dass ein Außenseiter gewonnen hat.
that a outsider won has
'… that an underdog has won'

b. * [Dieser Außenseiter gewonnen] hat (dort noch nie).
this outsider won has there never yet

c. [Ein Außenseiter gewonnen] hat *(dort noch nie).
a outsider won has there never yet
'No underdog has ever won there yet.'

(see Haider 1988: 108–109)

It remains puzzling why some material has to follow the finite verb in the c-examples above because the examples in (61) and (62) show that string vacuous movement of the verb is not ruled out generally.[22]

[22] Yvonne Viesel (p. c.) suggested that empty middle fields are acceptable only if a lexical verb appears in the V2-position but not if an auxiliary appears there. This appears to be the correct generalization, however, it remains to be investigated why this leads to a contrast in acceptability.

(61) a. Du spinnst.
you spin
'You're nuts.'

b. … dass du spinnst
that you spin
'… that you're nuts'

(62) a. [Geohrfeigt zu werden] schmerzt.
slapped to be hurts
'It hurts to be slapped.'

b. … dass geohrfeigt zu werden schmerzt.
that slapped to be hurts
'… that it hurts to be slapped.'
(Haider 1988: 109)

This descriptive presentation will suffice for now, for syntactic analysis of VP-topicalization see Ott (2018) and references therein.

Paratactic clauses

Generally, embedded clauses can occupy the prefield as illustrated for complement clauses in (63b) and adverbial clauses in (63c).

(63) a. Sicherlich hat Christopher angenommen, dass wir in die Kneipe gehen, weil
surely has Christopher assumend that we in the pub go because
wir das immer so machen.
we that always so make
'Surely, Christopher assumed that we will go to the pub because we always do that.'

b. [Dass wir in die Kneipe gehen] hat Christopher angenommen, weil wir das
that we in the pub go has Christopher assumend because we that
immer so machen.
always so make

c. [Weil wir das immer so machen] hat Christopher angenommen, dass wir in
because we that always so make has Christopher assumend that we in
die Kneipe gehen.
the pub go

However, some dependent clauses seem to be immobile although they show a typical embedded clause word order, such as the free *dass*-clauses (Reis 1997: 132–138) in (64).

(64) a. Christopher ist ein Idiot, dass er ihr den Pelzmantel bezahlt hat.
Christopher is an idiot that he her the fur coat paid has
'Christopher is such an idiot that he paid for her fur coat.'

b. * [Dass er ihr den Pelzmantel bezahlt hat] ist Chistopher ein Idiot.
that he her the fur coat paid has is Christopher an idiot

A similar observation can be made for the non-finite complementizer *um* (*zu*) 'for' and the corresponding finite complementizer *damit* 'so that': If they introduce final clauses as in (65) and (66), the embedded clauses are completely acceptable in the prefield.

(65) a. Sie nahm den Regenschirm mit, um nicht nass zu werden.
she took the umbrella with for not wet to become
'She took the umbrella with her so that she wouldn't get wet.'

b. [Um nicht nass zu werden] nahm sie den Regenschirm mit.
for not wet to become took she the umbrella with

(66) a. Sie nahm den Regenschirm mit, damit sie nicht nass werden würde.
she took the umbrella with so that she not wet become would
'She took the umbrella with her so that she wouldn't get wet.'

b. [Damit sie nicht nass werden würde,] nahm sie den Regenschirm mit.
so that she not wet become would took she the umbrella with

However, if these complementizers introduce a prospective clause, fronting of the dependent clauses is impossible, as illustrated in (67) and (68).[23]

(67) a. Sie stellte den Regenschirm neben sich, um ihn dann am Ende doch zu
she placed the umbrella next to her for it then at the end PRT to
vergessen.
forget
'She placed the umbrella next to her only to forget it anyway.'

b. * [Um ihn dann am Ende doch zu vergessen] stellte sie den Regenschirm
for it then at the end PRT to forget placed she the umbrella
neben sich.
next to her

(68) a. Sie stellte den Regenschirm neben sich, damit sie ihn dann am Ende doch
she placed the umbrella next to her so that she it then at the end PRT
vergaß.
forgot
'She placed the umbrella next to her only to forget it anyway.'

b. * [Damit sie ihn dann am Ende doch vergaß] stellte sie den Regenschirm
so that she it then at the end PRT forgot placed she the umbrella
neben sich.
next to her

[23] Thanks to Łukasz Jędrzejowski (p. c.) for making me aware of the immobility of prospective *um zu*-clauses.

Similarly, V2-complement clauses cannot appear in the prefield, as shown in (69a) and (69b). Example (69c) illustrates that a canonical V-final *dass*-clause can appear in the prefield in the same environment (see e. g. Reis 1997).

(69) a. Jeder$_i$ möchte gern glauben, er$_i$ sei unheimlich beliebt.
everyone wants gladly believe he is.SUBJ weirdly popular
'Everyone$_i$ wants to believe that he$_i$ is extremely popular.'

b. * [Er$_i$ sei unheimlich beliebt] möchte jeder$_i$ gern glauben.
he is.SUBJ weirdly popular wants everyone gladly believe

c. [Dass er$_i$ unheimlich beliebt sei] möchte jeder$_i$ gern glauben.
that he weirdly popular is.SUBJ wants everyone gladly believe
'Everyone$_i$ wants to believe that he$_i$ is extremely popular.'
(see Reis 1997: 139)

The same argumentation applies also to V2-variants of *weil* 'because' clauses, as shown by the paradigm in (70) (Frey 2012, Antomo & Steinbach 2010).[24]

(70) a. Ich komme nicht mit, weil ich habe kein Geld.
I come not with because I have no money
'I will not join you because I have not enough money.'

b. * [Weil ich habe kein Geld] komme ich nicht mit.
because I have no money come I not with

c. [Weil ich kein Geld habe] komme ich nicht mit.
because I no money have come I not with
'I will not join you because I have not enough money.'

I assume that such clausal elements have in common that they are paratactically connected with the main clause. As a consequence, they are not a proper constituent of the main clause and therefore cannot move to the prefield.

Long-distance elements

Typically, only constituents of the main clause can appear in the sentence-initial position. This correctly excludes adverbials of embedded clauses (Frey 2004), as shown by the contrast in (71), and extends to recursively embedded clauses, as in (72) and (73).

(71) a. Ich werde ihr mitteilen, dass der Professor gestern nach ihr gefragt hat.
I will her tell that the professor yesterday for her asked has
'I will tell her that the professor asked for her yesterday.'

b. * Gestern$_1$ werde ich ihr mitteilen, dass der Professor ~~gestern~~$_1$ nach ihr gefragt
Yesterday will I her tell that the professor for her asked
hat.
has

[24] The two variants of *weil*-clauses do not exhibit the same meaning potential. In addition to the literature cited above see Scheffler (2013: 50–55).

(72) a. Jedoch kann ich noch nicht glauben, [dass Christopher uns gestern erzählt
however can I still not believe that Christopher us yesterday told
hat, [dass wir das Haus von Oma erben sollen]].
has that we the house of grandma inherit should
'However, I still can't believe that Christopher has told us yesterday that we should inherit grandma's house.'

b. ??/* [Dass wir das Haus von Oma erben sollen]$_1$ kann ich noch nicht glauben,
that we the house of grandma inherit should can I still not believe
[dass Christopher uns gestern erzählt hat, t_1].
that Christopher us yesterday told has

(73) a. Also ging die Frau nach Hause, [bevor ihr Bruder husten musste, [weil
thus went the woman at home before her brother cough must because
er sich verschluckt hatte]].
he REFL choked on had
'Thus the woman went home before her brother had to cough because he choked on something.'

b. * [Weil er sich verschluckt hatte]$_1$ ging die Frau nach Hause, [bevor ihr
because he REFL choked on had went the woman at home before her
Bruder husten musste t_1].
brother cough must

However, long-distance extraction is possible for *wh*-elements as in (74a), degraded for NPs as in (74b), and strongly degraded for VPs as in (74c), (Müller 2004). Additionally, such long-distance extractions have been intensively discussed under the term *Syntactic Islands*. It became clear that the overall acceptability of such structures depends on the clause type (see Freitag 2012 and references therein) and is also subject to dialectal variation (Fanselow & Weskott 2010).

(74) a. Wen$_1$ hast du gedacht, dass der Schlagzeuger ~~wen~~$_1$ geküsst hat?
who.ACC have you thought that the drummer kissed has
'Who did you think that the drummer had kissed?'

b. ?/?? [Die Jule]$_1$ habe ich gedacht, [dass der Schlagzeuger ~~the Jule~~$_1$ geküsst hat].
the Jule have I thought that the drummer kissed has
'I thought that the drummer had kissed Júle.'

c. ??/* [Die Jule geküsst]$_1$ denke ich, [dass der Schlagzeuger gestern ~~die Jule geküsst~~$_1$
the Jule kissed think I that the drummer yesterday
hat].
has
'I thought that the drummer had kíssed Júle yesterday.'

(see Müller 2004: 201–203)

In sum, some constituents of more deeply embedded clauses are able to move to the prefield. However, long-distance extraction is very restricted.

Summary of licit prefield elements

The discussion revealed that the prefield position is a proper syntactic position that must be filled in declarative clauses, as a last resort option even by a semantically empty expletive. Typically any main clause constituent may occupy this position. The restrictions on prefield elements can be divided into three major groups. First, paratactic clauses and constituents of lower embedded clauses are forbidden because they do not count as constituents of the main clause. Furthermore, the sentence-initial position is strongly related to an information structural position of the sentence topic or emphatic contrast. This accounts for the second type of restriction: If an element cannot function as a topic or does not employ a meaningful contrast, the element is infelicitous in the prefield, such as certain verbal particles and presumably qualificational adverbs. The third type of restriction is directly related to the special interpretation of this position: If the element in question is not the highest element in the middle field, it cannot move to the prefield without bearing stress. Weak pronouns cannot bear stress and can therefore only move to the prefield if they are the highest element of the middle field. Three phenomena that have been discussed are not covered by these explanations. These are negation, discourse particles and VP-topicalization. For each of these elements I have noted that there is cross-linguistic variation among the V2-languages whether these elements are allowed in the prefield or not. This indicates that the restrictions are rather language-specific and not a direct property of the V2-configuration as such. I must leave the explanation of these elements for future research.

2.2 Exceptions: Non-V2 structures

Exceptional non-V2-structures come in three main categories: first, clauses with an empty prefield, second, independent clauses in which the finite verb does not move at all, i. e. V-final main clauses, and third, clauses in which more than one constituent appears in the prefield, before the fronted verb.

2.2.1 V-initial clauses

In addition to polar interrogatives, German also exhibits declarative clauses with V1-order. Two forms must be distinguished. The first is the result of *Topic Drop* (see Oppenrieder 2013: 36–39, Trutkowski 2016). As shown in (75a), an argument can be left out if it is a salient topic whereas (75b) illustrates, that deletion of the same element is illicit in the middle field. Hence these structures are underlyingly proper V2-clauses.

(75) Was ist mit den Weingläsern?
'What about the wine glasses?'
a. ~~Die~~ Hab ich schon auf den Tisch gestellt.
them have I already on the table placed
'I've already placed them on the table.'
b. * Ich hab ~~die~~ schon auf den Tisch gestellt.
I have them already on the table placed

However, German exhibits several specific V1-declaratives such as the justification sentence in (76a), which is not only a variant of a V2-clause, as the contrasting example in (76b) shows. Further examples are given in (77) that are typical for narrative style, such as, but not exclusively, jokes (Oppenrieder 2013: 40-42).

(76) Mit dem nahrhaften Blut ihrer Opfer aber schlürfen die Mücken auch Fremdkörper ein, die mitunter eine immunologische Herausforderung sind.

'Together with the nutritious blood of their victims, mosquitoes also suck foreign matter that can be an immunological challenge.'

a. (*Es) Müssen sie sich doch mit ihrem Rüssel durch eine Haut voller
EXPL must they REFL PRT with their proboscis through a skin full of
Bakterien bohren.
bacteria pierce

'Because they must pierce with their proboscis through a skin full of bacteria.'

b. Sie müssen ~~sie~~ sich (*doch) mit ihrem Rüssel durch eine Haut voller
they must REFL PRT with their proboscis through a skin full of
Bakterien bohren.
bacteria pierce

'They must must pierce with their proboscis through a skin full of bacteria.'

(Oppenrieder 2013: 40)

(77) a. (#Es) Kommt ein Mann zum Arzt.
EXPL comes a man to the doctor

'A man came to the doctor.'

b. Ich geh heute auf den Markt. (Da) Kostet ein Bund Petersilie 2 Euro.
I go today on the market there costs a bunch parsley 2 Euro

'I went to the market today. A bunch of parsley cost 2 Euros.' (see Oppenrieder 2013: 41)

c. (*Es/ *So) Sollen sie ihn (doch) haben.
EXPL so should they him PRT have

'They should have him then.' (see Oppenrieder 2013: 42)

These V1-structures also have specific felicity conditions that correlate with their interpretational properties. Syntactically, they might be treated on a par with other V1-structures, such as polar interrogatives.

2.2.2 V-final main clauses

German also exhibits independent clauses in which the finite verb remains in its base position. These either show formal features of interrogative clauses, such the interrogative in (78a) and the exclamative in (78b), or they exhibit a complementizer such as the declarative *dass* in (79a) or the interrogative *ob* in (79b). Truckenbrodt (2013) provides arguments against

an ellipsis analysis and details about the felicity conditions and the interpretational potential of independent V-final clauses (see also Oppenrieder 2013: 42–43).

(78) a. Was er wohl eingekauft hat?
what he PRT bought has
'(I wonder) What he might have bought?'

b. Wie schön du doch Klavier spielen kannst.
how beautiful you PRT piano play can
'How beautiful you play the piano.'

(79) a. Dass du mir (ja) nicht zu spät heimkommst!
that you me PRT not to late home come
'Don't be late tonight!' (Truckenbrodt 2013: 238)

b. (X: Peter hasn't written in a long time.
Y: That's true.)
X: Ob es ihm gut geht?
whether it him well goes
'I wonder whether he is doing well.' (Truckenbrodt 2006a: 261)

All V-final main clauses are formally identical to embedded clauses. Hence, the syntactic structure is comparable to regular embedded clauses in German. Clearly, there must exist a pragmatic mechanism to interpreted these dependent clauses as an illocutionary act, a topic which is well beyond the scope of the present discussion (see Bayer 2004: 84–89).

2.2.3 V>2 structures

There are also some structures that (apparently) exhibit more than one constituent before the finite verb. Connectors such as *denn*, *doch*, and *aber* precede the sentence-initial constituent, as in (80), which shows that this also holds for non-subject-initial clauses.

(80) Denn/ doch/ aber [Rosinen] mag Christopher nicht.
because however but raisins likes Christopher not
'Because/However/But Christopher doesn't like raisins.'

A different type of complex prefields are discussed in Müller (2003), Müller (2004: 218–219), and Müller (2005), among others. Examples of characteristic patterns are given in (81). It has been noted that the order of the two prefield elements is fixed (Müller 2005: 307–308), that the fronted elements have to be clause mates (Fanselow 1993: 67)[25], and that the acceptability of examples like (81e) depends on the specificity and definiteness of the fronted DPs (Müller 2004: 218–219). Müller (2005) proposes to analyze the fronted elements as one complex constituent with an empty head, similar to a VP. Under such an analysis, the prefield is only apparently filled with multiple constituents.

[25]Note that extraction out of embedded clauses is highly restricted on its own, as discussed in Section 2.1.4.

(81) a. [Fast alles] [im Sitzen] bewältigt Fernando Escartin auf dem Weg zum
almost everything in sitting manages Fernando Escartin on the way to the
Gipfel ~~fast alles im Sitzten bewältigt~~.
peak
'Fernando Escartin manages handles almost all passage on it way to the peak seated.' (Müller 2004: 219)

b. [Alle Träume] [gleichzeitig] lassen sich nur selten ~~alle Träume gleichzeitig~~
all dream simultaneously let REFL only seldom
verwirklichen ~~lassen~~.
realize
'Only seldom, one can realize all dreams at once.' (Müller 2005: 299)

c. [Zum zweiten Mal] [die Weltmeisterschaft] errang Clark 1965 ... ~~zum zweiten Mal~~
to the second time the world championship won Clark 1965
~~die Welmeisterschaft errang~~.

'Clark won the world championship in 1965 for the second time.' (Müller 2005: 300)

d. [Von Konstanz] [nach Bern] wird Urs morgen ~~von Konstanz nach Bern~~ fahren
from Constance to Bern will Urs tomorrow drive

'Tomorrow, Urs will drive from Constance to Bern.' (Fanselow 1987: 99)

e. ?? [Kindern] [Bonbons] sollte man ~~Kindern Bonbons~~ nicht geben ~~sollte~~
children sweets should one not give
'One should not give sweet to children.' (Müller 2004: 218)

Grewendorf (2013) argues that German provides a principled option of left-dislocating[26] topic constituents in a position preceding the canonical prefield, as shown for an argument in (82a), also preceding a *wh*-term as in (82b), and for adverbials in (82c) and (82d). Those initial constituents cannot occupy the prefield.[27]

(82) a. [Den Gesetzentwurf zur Armeereform,]$_i$ [den$_i$] lehnte der Senat ab.
the draft bill to the army reform this refused the senat PRT
'The draft bill of the army reform, the senat refused it.'

b. [Den Studenten,]$_i$ [wer] hat den$_i$ gestern kritisiert?
the student who has him yesterday criticized
'This student, who criticized him yesterday?'

[26] I will exclude so-called *hanging topics* (*nominativus pendens*) because they are less integrated into the host clauses (see Shaer & Frey 2004, Nolda 2004).

[27] Though for different reasons: If the sentence-initial DP in (82a) appears in the prefield, the resumptive pronoun must be deleted. The same applies to (82b), in addition to the complementary distribution with the *wh*-term in the prefield. If the adverbial clause in (82c) appears in the prefield, it is preferably interpreted as an integrated conditional clause which results in an implausible interpretation. The initial constituent in (82d) cannot appear in the prefield at all.

c. [Wenn du Durst hast,] [im Kühlschrank] ist ein Bier.
if you thirst has in the fridge is a beer
'In case you are thirsty, there's beer in the fridge.'

d. [Wen immer du einlädst,] [ich] komme nicht.
who ever you invite I came not
'Whoever you will invite, I will not come.'

(Grewendorf 2013: 655–666, 668)

A phenomenon that looks superficially similar is *emphatic topicalization*, described in Bayer & Dasgupta (2016) and illustrated in (83): A constituent of the embedded clause is topicalized in front of the complementizer. As a consequence, the embedded clause must appear sentence-initially. If the analysis of Bayer & Dasgupta (2016) is correct, the prefield is occupied by only one constituent, an embedded clause with a complex prefield of its own.

(83) Bavarian

a. [[Da Hans] [ob ~~da Hans~~ kummt]]$_1$ woass-e ned t_1.
the Hans whether comes know-I not
'As for Hans, I don't know whether he will come.' (Bayer & Dasgupta 2016: 5)

b. [[Der] [wenn ~~der~~ das nochmal macht]]$_1$ bin ich echt grantig t_1.
he when this again does am I really pissed
'If he does this again, I'm going to be really pissed.'[28]

Additionally, it has been noted that multiple adverbials can be placed in the prefield, which is known as *adverbial stacking* and illustrated in (84a) for Swedish and in (84b) for German. The German example also illustrates the restrictions on adverb stacking: First, stacked adverbials show the same (language-specific ordering) as in the middle field. Second, only event modifying adverbials take part in the stacking, i. e. they cannot be accompanied by the epistemic adverbial *vermutlich* 'pressumably' or the optional argument *ein Lied* 'a song' although these might appear in their base position. Even though the adverbials form separate prosodic phrases, it is commonly assumed that they form a kind of cluster that occupies only a single syntactic position (Haider 2000a: 97-102, Holmberg 2015: 353–354).

(84) a. Swedish
[I går,] [vid femtiden,] [utanför stationen,] [när jag kom från jobbet,]
yesterday at about.five outside the.station, when I came from work,
mötte jag en gammal skolkamrat.
met I an old schoolmate
'Yesterday, at about five, outside the station, when I came home from work, I met an old schoolmate of mine.' (Holmberg 2015: 353)

[28] From a speaker of Northern Bavarian.

b. German
[Vor zwei Wochen] [in Italien] [am Strand] [als die Sonne ungerging]
before two weeks in Italy at the beach when the sun sunk
⟨*vermutlich⟩ ⟨*ein Lied⟩ hat der Junge ⟨vermutlich⟩ ⟨ein Lied⟩ gesungen.
presumably a song has the boy presumably a song sung
'In Italy, at the beach, two weeks ago, before the sun disappeared, the boy presumably sang a song.'

A further form of complex prefield is currently discussed for urban vernacular varieties of German (*Kiezdeutsch*), Danish, Swedish and Norwegian.[29] Characteristic for this V3-configuration is that exclusively in subject-initial main clauses, one adverb may precede the subject, as shown in (85). For more details see Wiese (2009), Freywald et al. (2015), Walkden (2017), Bonke (2017). Crucially, the fact that this pattern does not extend to object-initial clauses and that it is not obligatory for subject-initial clauses indicates that it is discourse pragmatically driven and does not represent a novel syntactic structure (see especially Freywald et al. 2015).

(85) non-standard German (Kiezdeutsch)
a. [ab jétzt] [ich] krieg immer zwánzig euro
from now I get always twenty euros
'From now on, I get always twenty euros.' (Freywald et al. 2015: 89)
b. [danach] [er] sagt zu O., geh mal wég
afterwards he says to O. go prt away
'Afterwards, he says to O. [=name], go away.' (Walkden 2017: 55)

In sum, we have seen that there are several cases in which either complex elements occupy the prefield or an additional element precedes a V2-structure for specific discourse pragmatic reasons. However, all these options are highly restricted.

2.2.4 Summary of the non-V2 patterns

In this section, I have presented three classes of deviations from V2-patterns. The first two have been identified as syntactically regular V1-patterns and as embedded clause patterns. What makes them exceptional is not their syntactic structure but their usage as independent utterances. In the third class, apparently more than one constituent precedes the V2-position. Such an extension of the left periphery seems likely for connectors like *aber* 'but' and left-dislocated elements including the examples from the urban vernacular varieties. For the other form of complex prefields, subsuming emphatic topicalization and adverbial stacking, it seems likely that only one constituent, though a complex one, occupies the prefield.

[29] According to Freywald et al. (2015), these structures occur extremely rarely in the corresponding Dutch variant.

2.3 Explanations: A brief history of syntactic accounts

The core characterization of the V2-phenomenon was already described by Erdmann (1886: 182–185)[30], who states explicitly that the position preceding the finite verb is not a specific subject position but can be freely occupied by other nouns, adverbials, predicative expressions, or even dependent clauses. This description, however, does not explain how this configuration emerges. In the following, I will focus on the productive line of research based on transformational grammar that assumes that the V2-order is a derived order. Opponents of transformational analyses proposed two unrelated ordering sources for matrix and embedded clause order, for instance Bartsch & Vennemann (1972), but see Koster (1975) for a principled criticism. But even within the generative grammar, we find a variety of analyses. Ross (1969: 95) for instance proposed that the base word order of German is SVO and the finite verb is moved into the clause-final position in embedded clauses by a movement rule.

2.3.1 Insertion into the middle field

The insight that German (and Dutch) posess a verb-final basic word order is not very old. Bierwisch (1963: 34) acknowledges that Fourquet (1959) was the first who formulated the observation that the order of subordinate clauses is actually the basic configuration from which the orders of main clauses are derived. Fourquet (1959: 139, fn. 6) also argued that there is one structural position in front of the finite verb which can be filled by subjects and non-subjects alike and that a subject-oriented syntax, does not add any explanatory value, as expressed in the following quote:

> The rule that the subject is inverted after the verb if the first constituent that precedes the finite verb is not the subject is as insightful as the statement that a motorcyclist in France does not give a German a lift if he already has a non-German on the pillion. It is forbidden by law to have more than one person on the pillion: that is all.[31]

Early transformational grammar approaches for German word order have been more or less simultaneously published by Bach (1962) and Bierwisch (1963), even though the latter is far more extensive. The basic derivation of V2-order, however, is almost identical. Both authors propose to derive the appropriate order by placing the finite verb behind the first constituent (Bach 1962: 269, Bierwisch 1963: 111).[32] These approaches could therefore be translated as inserting the verb after the highest element in the middle field, i. e. the sub-CP-domain.[33] That the OV-order is the underlying order and the basis for the transformational

[30] Reference found in Haider (1985: 49).

[31] "Die Regel, daß das Subjekt dem Verb nachgestellt ist, wenn das erste Satzglied, auf das das v. f. [verbum finitum] folgt, nicht das Subjekt ist, hat ebensoviel Wert wie die Feststellung, daß in Frankreich ein Motorradfahrer keinen Deutschen aufnimmt, wenn er einen Nicht-Deutschen auf dem Soziussitz hat: gesetzlich darf er nicht zwei Personen auf den Soziussitz nehmen, das ist alles." (Fourquet 1959: 139, fn. 6, translation C. F.)

[32] V1-structures are the result of placing the finite verb behind a phonologically empty element. Interrogatives, imperatives and prefield expletive-*es* are generated by morphophonemic rules (Bierwisch 1963: 112).

[33] It must be noted that a mapping onto a modern sentence skeleton is not unproblematic.

rule is motivated by the following observations: All infinitival forms occur in clause-final position as in (86a), and in complex verb forms, only the finite element moves whereas all other elements appear in the clause-final position as in (86b). Fragment answers and lexical mentioning always show verb-final order, as in (86c) and (86d). Furthermore, particles of particle verbs appear in the clause-final position, as in (86e) (see Bierwisch 1963: 35).

(86) a. Er *versprach* einen Teller zu *kaufen.*
he promised a plate to buy
'He promised to buy a plate.'

b. Er *hätte* einen Teller *gekauft haben sollen.*
he had a plate bought have should
'He should have bought a plate.'

c. A: Was machst du?
'What do you do?'
B: Zigaretten *holen.*/ **Holen* Zigaretten.
cigarettes get get cigarettes
'get cigarettes'

d. jemandem etwas *schenken*/ *jemandem *schenken* etwas/ **schenken* jemandem etwas
somebody something donate somebody donate something donate somebody something
'donate somebody something (as a present)'

e. Ich *höre* morgen mit dem Rauchen *auf.*/ *Ich *aufhöre* morgen mit dem Rauchen.
I listen tomorrow with the smoking up I up listen tomorrow with the smoking
'I will quit smoking tomorrow.'

Additional support for the underlying V-final order comes from verbs that cannot undergo movement to the V2-position, as discussed in Section 2.1.3: All verbs that can appear in V2-position do also appear in clause-final position but not vice versa.

To prevent verb movement in embedded clauses, Bach (1962: 269) included a clause boundary symbol into the definition of the transformation rule by stipulation.

2.3.2 V-to-C movement (plus phrasal movement)

Within the sentence skeleton of the X-bar theory, the restriction of V2-movement to main clauses could receive a principled explanation. Emonds (1970: 10–12) noticed that V2 is only one of several syntactic transformations that apply only in root clauses, hence the term *root transformations*. Den Besten (1983) attempted to generalize the notion of root transformations even further and identified two crucial insights for the analysis of V2-clauses: First, V2-

movement (and likewise all root transformations) targets the clause-initial COMP-position.[34] The verb thereby moves into a fixed position with the consequence that, in subject-initial clauses, the subject has to preposed like all other initial constituents. Den Besten (1983: 56–60) provides the following arguments in favor of the positional identity of the V2-position and the COMP-position. Weak pronouns in Dutch appear right-adjacent to the finite verb in main clauses and right-adjacent to the complementizer in subordinate clauses.[35] Additionally, the positional identity of V2 and COMP accounts for the complementary distribution of verb movement and overt complementizer in German and Dutch (den Besten 1983: 17–18). Furthermore, den Besten (1983: 115–117) introduces the idea that verb movement is triggered by a morphosyntactic feature. Motivated by the selectional differences of complementizers like *dass* 'that', which combines with finite (tensed) VPs, and complementizers like *um* 'for', which combines with non-finite (untensed) VPs, he labels this feature *tense*. This labeling is somewhat surprising considering that non-finite forms may express temporal relations and that, in complementizer agreement, only subject-agreement morphemes show up at the complementizer, as den Besten (1983: 119) even notes himself. To account for the movement of the sentence-initial phrase, den Besten (1983: 60–61) formulates a Wh-*Movement Rule* and a *Constituent Preposing Rule* in the fashion of the transformational grammar. Generally this mechanism has been retained, even though it is currently assumed that the movement is triggered by specific features on the C head that may be more directly connected to interpretational aspects like in *wh*-questions[36], or must be formally enforced by an EPP-feature[37]. A simple scheme of the V-to-C analysis is given in (87).

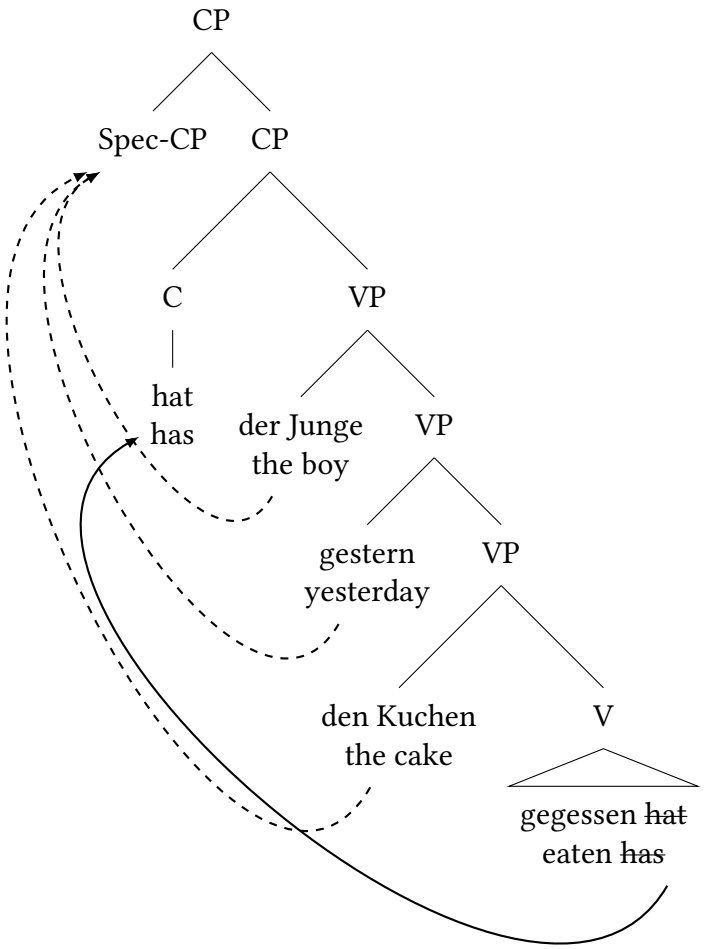
[34] As den Besten (1983: 51,107) acknowledges, the idea that V2 is generated by verb movement and (subsequent) movement of one constituent (including the subject) in front of the verb has also been assumed around the same time by Higgins (1973: 152, fn. 5), Williams (1974), Koster (1975), and Emonds (1976: 40).

[35] Similar restrictions on the placement of pronouns hold for German too (see Haider 2010: 131–141).

[36] Following Cheng (1991), movement of a *wh*-phrase into the left periphery is one way to execute *clausal typing* (see also Brandner 2004).

[37] The *Extended Projection Principle* (Chomsky 1981) captures the observation that some heads (such as I in English) require an overt constituent, in this case a subject, which may also be a semantically empty expletive. A similar regularity holds for the prefield element in V2-languages. In the minimalist framework this EPP-feature corresponds to a strong feature (Chomsky 1995: 232). However, the relatively free choice of constituents which may satisfy this feature in V2-clauses is much more problematic than for subjects.

(87)



2.3.3 (A)symmetric V2: V-to-I movement in subject-initial clauses

Within the Principles and Parameters approach, scholars tried to account for the word order variation within the Germanic V2-languages with different phrase structure parameters, namely V-to-I and I-to-C movement (see e. g. Platzack 1986, Vikner 1995). Some authors have doubted that all V2-clauses are derived by V-to-C movement. Two popular proposals of this kind are Travis (1991) and Zwart (1994).[38] The interesting departure from the *traditional* analysis is that they assume that V2-movement does not target a uniform position within the

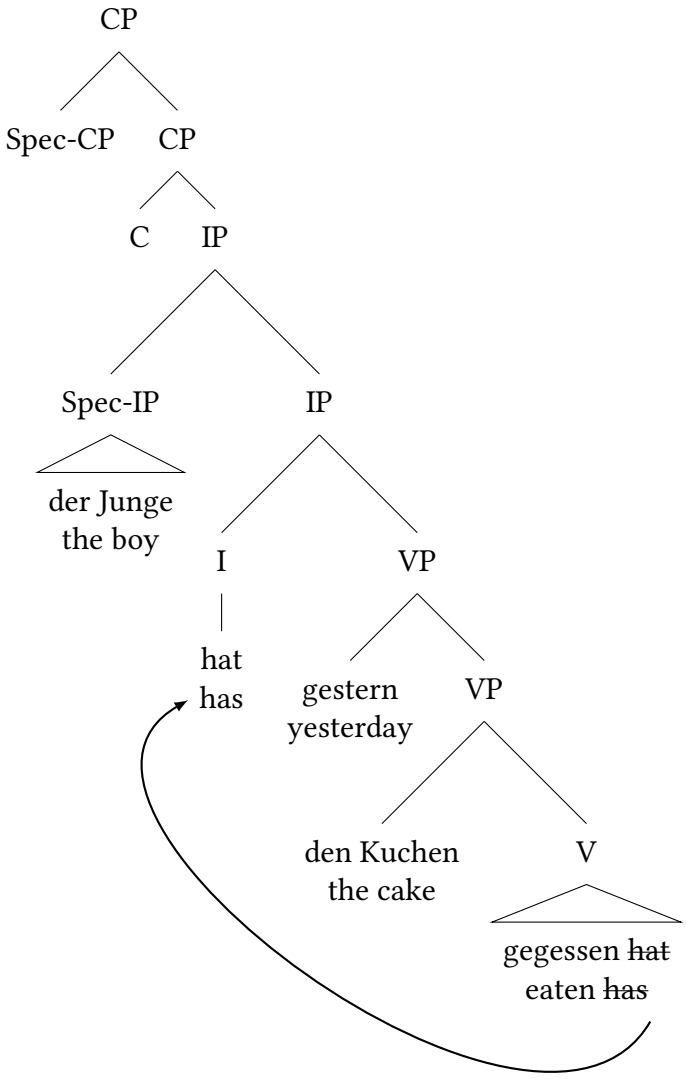
[38]These two accounts differ with respect to the headedness of the VP: Travis (1991) assumes a head-final VP for German and Dutch whereas Zwart (1994) assumes a head-initial VP following the *antisymmetry* approach of Kayne (1994). In a nutshell, Zwart (1994) proposes that the basic underlying word order of Dutch (and German) is SVO, from which a second order, namely SOV is derived by raising the subject and the object to higher functional positions (Spec-AgrObjP and Spec-AgrSubP). Note the criticism of antisymmetry approaches to SOV-languages in Haider (2012).

clause structure but that subject-initial clauses are generated by movement of the verb to the phrase-initial I-head[39], as shown in (88). Non-subject-initial clauses are analyzed as V-to-C movement as in the traditional account, as in (89).

(88) Subject-initial clause

a. Der Junge hat gestern den Kuchen gegessen ~~hat~~.
[the boy].NOM has yesterday [the cake].ACC eaten
'The boy has ate the cake yesterday.'

b.

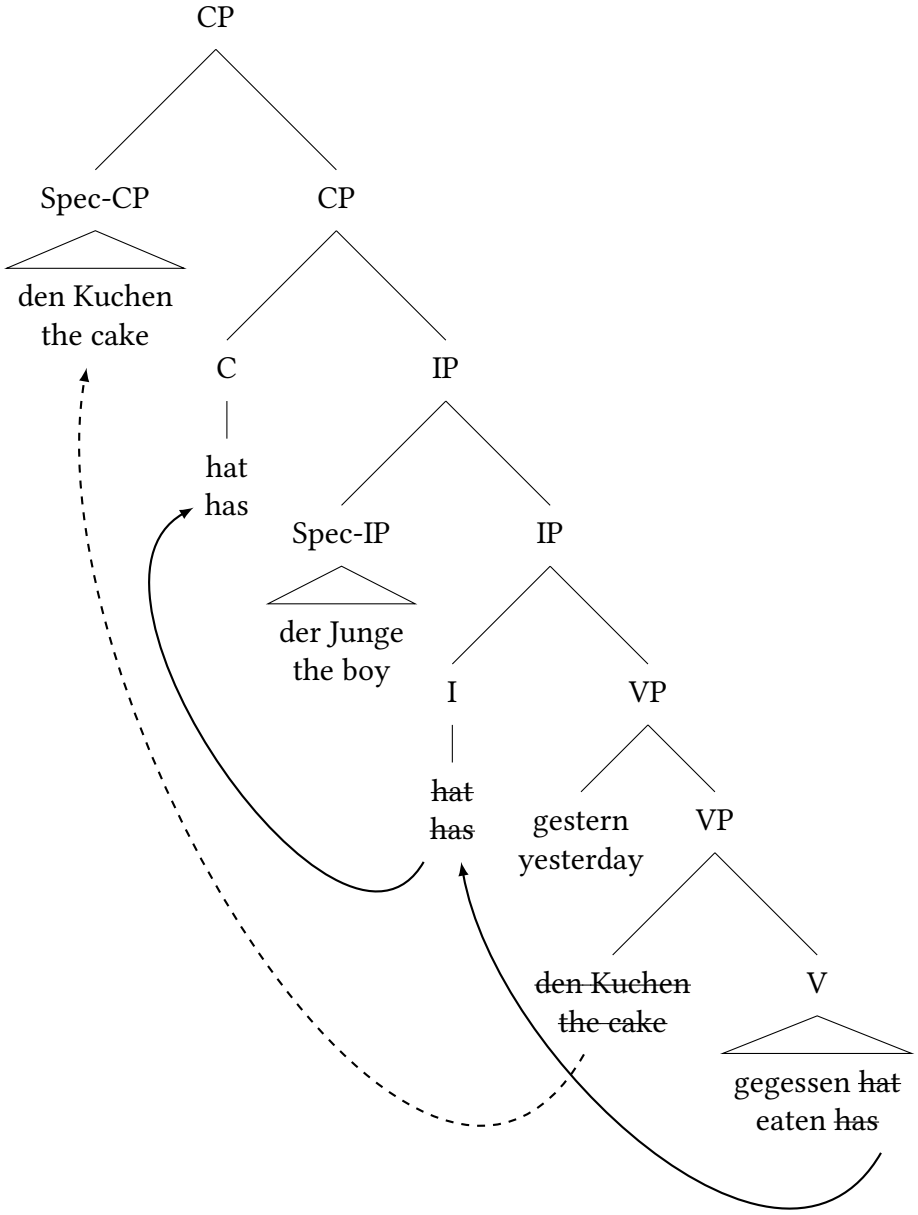


[39] In Zwart (1994), this head is identified as the AgrSubj-head of a split-IP model.

(89) Non-subject-initial clause

a. Den Kuchen hat der Junge gestern ~~den Kuchen~~ gegessen ~~hat~~.
[the cake].ACC has [the boy].NOM yesterday eaten
'The boy ate the cake yesterday.'

b.



I will not go into detail of the theoretical arguments concerning the contemporary models at that time but rather focus on the empirical arguments in favor of a distinction between subject-initial and non-subject-initial clauses (for an extensive discussion with counterarguments see Schwartz & Vikner 1989 and Schwartz & Vikner 1996). The main evidence comes

from the distribution of clitics and weak pronouns. The observation is that there is an asymmetry that allows weak pronouns to appear in the prefield only if they are subjects and not if they are objects (Travis 1991: 359). The example is illustrated for the neuter German weak pronoun *es* 'it' in (90). Taking the sentence in (90a) as an illustration of the base order, it is possible to express the subject by a weak pronoun, as in (90b), but unacceptable for the object, as in (90c). As I have discussed in Section 2.1.4, this asymmetry is only apparent and depends on the definiteness and specificity of the other arguments in the middle field. As Travis (1991: 359) partly suggests, the problem of putting *es* into the prefield position seems to correlate with the incompatibility of stressing *es*. Consequently, changing the sentence as in (90d) allows an unstressed object-*es* in the prefield.

(90) a. … dass das Kind gestern das Buch gelesen hat
that the child yesterday the book read hat
'… that yesterday the child read the book.'

b. Es hat gestern das Buch gelesen.
it has yesterday the book read
'Yesterday it read the book.'

c. * Es hat das Kind gestern gelesen.
it has the child yesterday read
'Yesterday the child read it.'

d. Es hat noch niemand gelesen.
it has yet nobody read
'Until now, nobody read it.'

2.3.4 Two types of V2-movement: Force and Fin

Following the influential article of Rizzi (1997), the C-domain has been divided into an articulated structure with functional layers, that are related to specific information structural properties on the one hand, such as frame setting, topic, and focus, and two positions that are related to the clause-internal structure and the superordinate structure, namely Fin and Force. Such an articulated periphery may look like in (91). Each of the layers provides a head position and a specifier position. Intuitively, FinP has been associated with V2-movement because V2-movement only affects finite verbs. The additional positions have been used to account for systematic extensions of the V2-constraint to V3(+n) structures, especially in North Italian dialects (Poletto 2002) and Medieval Romance (Wolfe 2016). To account for typical V2-languages which provide only one position in front of the finite verb, Poletto (2002) and Wolfe (2016) propose that verb movement targets different final landing sites in those languages: In all V2-languages, in order to check the finiteness feature, the finite verb moves to FinP, which is also the final landing site in Fin-V2 languages. As a consequence, more than one element may precede the moved verb. In Force-V2 languages on the other hand, the Force-head has a strong feature that attracts the finite verb in Fin. Consequently, only frame setters or hanging topics may precede the V2-position (Poletto 2002: 237–238).

(91) $[_{\text{HangingTopic/FrameP}}\ [_{\text{ForceP}}\ [_{\text{TopP}}\ [_{\text{FocP}}\ [\ _{\text{FinP}}\ [_{\text{TP}}\ \dots\ ]]]]]]$

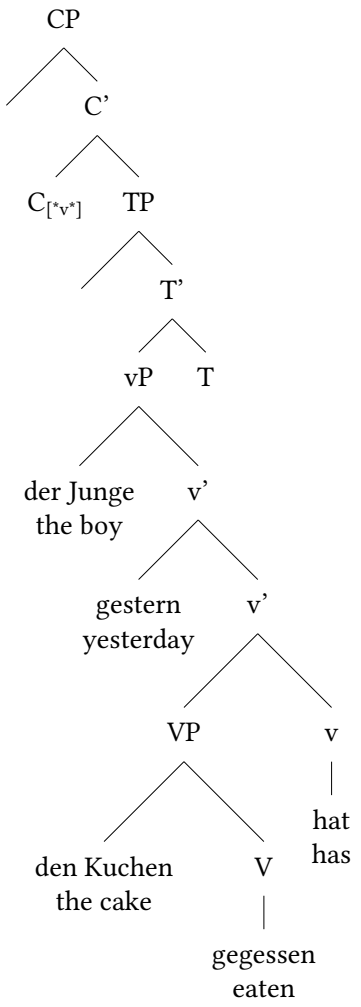
The *Split-V2* approach offers a way to account for cross-linguistic variation of the number of elements preceding the finite verb in (apparent) V2-languages. However, it does not provide any insight as to why the verb moves and what triggers this movement to FinP. On the contrary, this account introduces a further puzzle, namely a second abstract feature in ForceP that attracts the finite verb in FinP. In sum, we see that in such a two-stage system, we have to duplicate the stipulated trigger for V2-movement that is already problematic in the classical V2-system.

2.3.5 Remnant movement

Müller (2004) proposes a remnant movement account for V2 in German. In this account, the V2-configuration does not result from two different movements into the C-domain but from only one phrasal movement operation of vP into Spec-CP. Müller (2004) assumes a structural analysis of a simple German sentences as in (92).

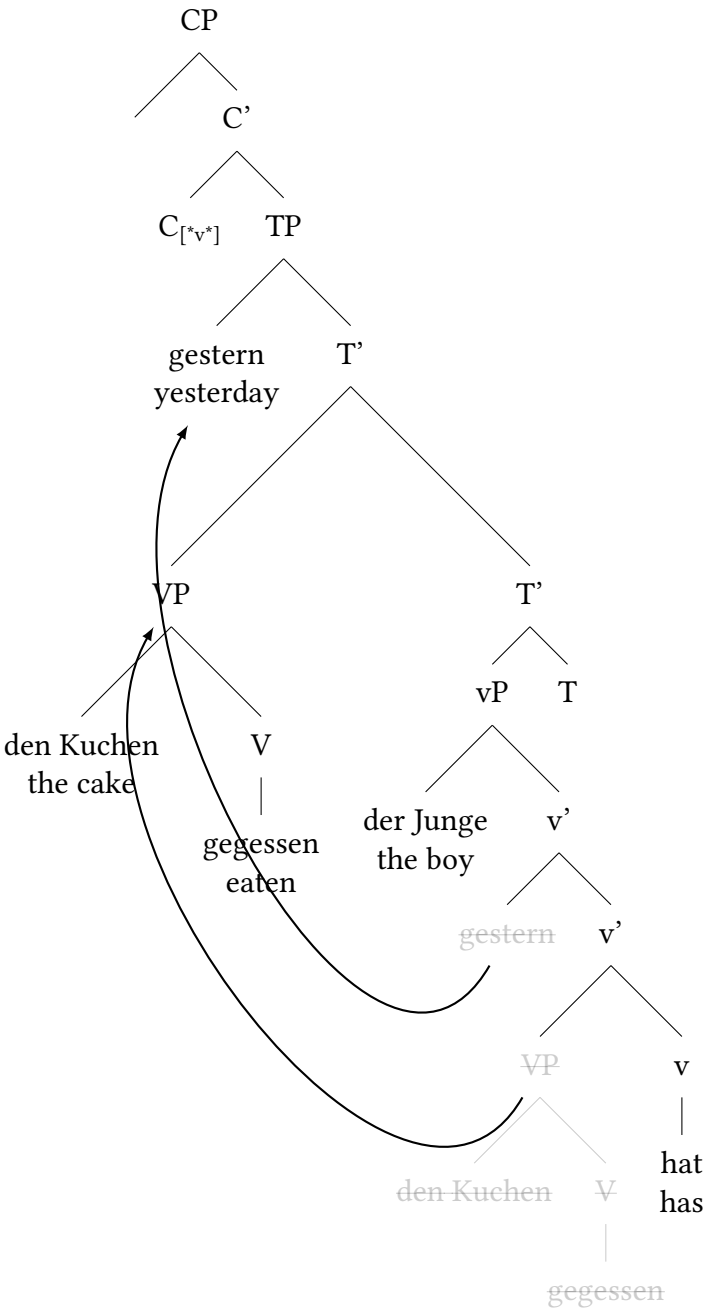
(92) a. (dass) der Junge gestern den Kuchen gegessen hat
that the boy yesterday the cake eaten has
'that yesterday, the boy ate the cake.'

b.

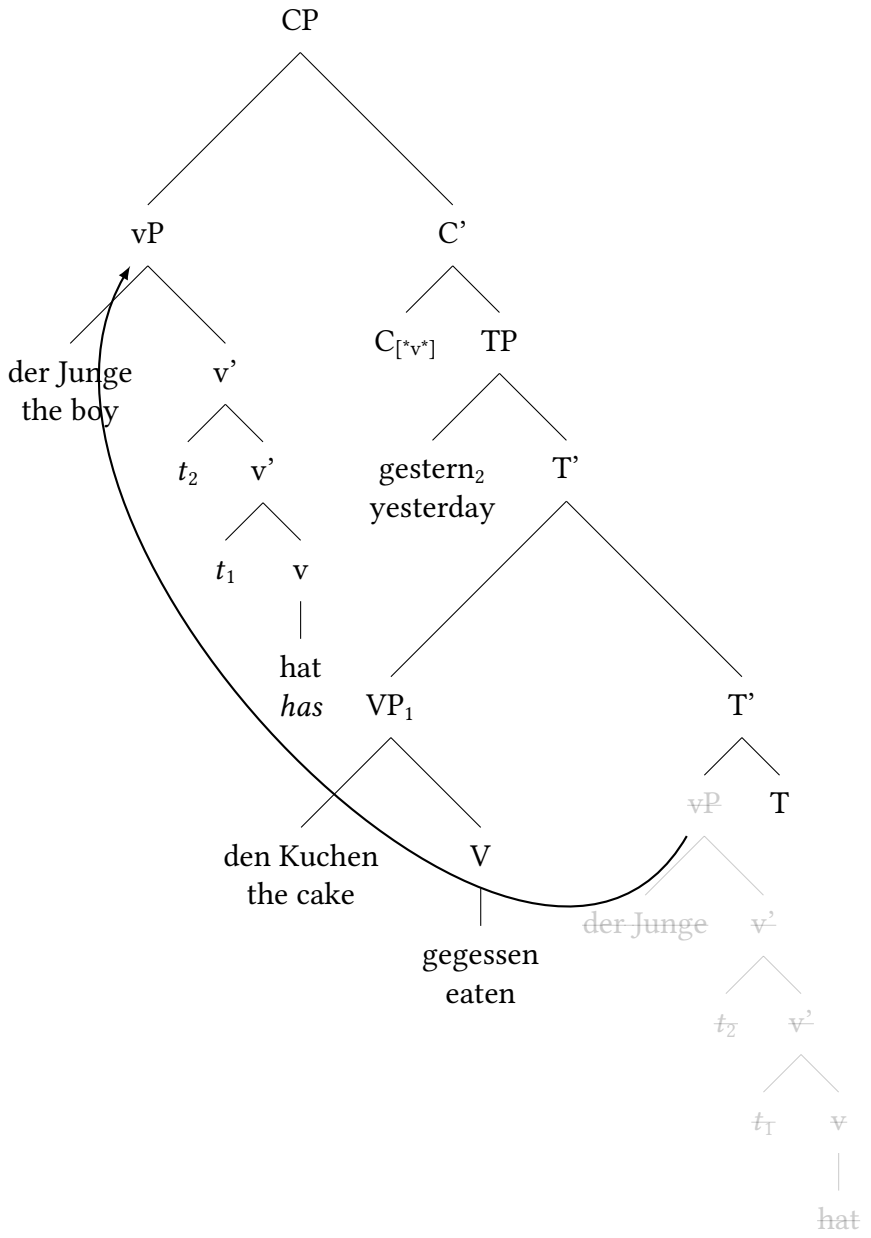


At this stage, all surface constituents are inside vP. Moving vP to Spec-CP would therefore not change the order of the constituents. To obtain the V2-order, all elements that should not appear in the C-domain must be evacuated from vP, as shown in (93). Subsequently, the vP moves to Spec-CP and yields a subject-initial V2-clause, as in (94).

(93)

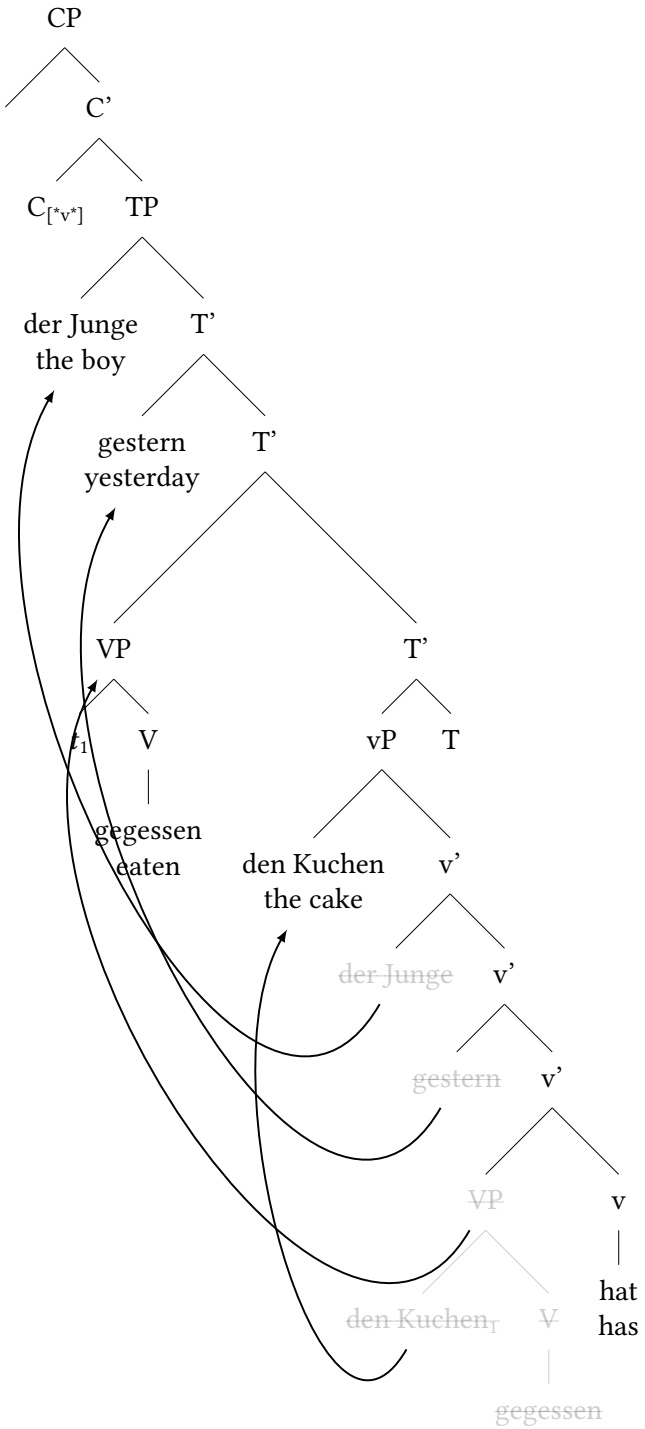


(94)



The derivation of object-initial V2-clauses is even more complicated, as shown in (95). Only after a cascade of evacuation movements, the vP is prepared to move to Spec-CP: First, the object is scrambled to the edge of vP. Afterwards, the remaining VP, the adverbial, and the subject are raised to specifiers in the T-domain.

(95)



I will not discuss further sentence types but rather focus on the mechanism. Movement is feature driven. Therefore, the movement of vP to Spec-CP must be induced by a feature. Müller (2004) assumes that the C-head bares a strong feature [*v*] which attracts vP. In this respect, the remnant movement account has to stipulate the attraction mechanism in

the same way as the traditional account does for the head movement. Furthermore, Müller (2004) has to assume additional movement triggerw to enable the evacuation of the vP, such as an optional [*D*] feature on T (Müller 2004: 189).

2.3.6 Semantico-pragmatic accounts of V2

Semantico-pragmatic accounts of V2 received a lot of attention in the last thirty years (e. g. Wechsler 1991, Brandner 2004, Truckenbrodt 2006a,b, Julien 2015, Lohnstein in preparation). I will not go into the details of the differences between these formalizations but rather focus on the common core and sketch two problematic issues.

The history of these accounts starts with the observation of Hooper & Thompson (1973) that root transformation apply only in *asserted* clauses. Common to the above-mentioned accounts is that they derive the illocutionary force in a combinatorial fashion in which verb movement plays an essential part. Truckenbrodt (2006a), for instance, assumes that the CP bears context indices which must be checked via verb movement. These context indices specify the deontic aspect of the speech act, i. e. what the speaker wants in uttering the sentence. Imperative morphology specifies that the speaker wants the addressee to perform what is denoted by the clause. Declaratives and interrogatives are used in acts to change the epistemic states of the interlocutors: Declaratives are used to assert something, i. e. the addressee should accept the content of the utterance. Interrogatives are used to ask the addressee for information. Whereas in –WH clauses, verb movement is essential for evaluating the epistemic component, the crucial effect in +WH clauses reduces to addressee-specification. This already indicates that the ascribed function of computing the illocutionary potential is non-trivial and verb movement does not serve only one purpose. The two effects are devoted to different properties of the verb: verbal mood for the epistemic component and subject-verb agreement for addressee-specification.

Semantico-pragmatic accounts are very attractive because they provide an explanation for why the verb actually has to move. They have in common that they assume that verb-movement is triggered by the need to type a clause, i. e. to express some kind of illocutionary force. And while there seems to be a strong correlation between verb position and clause types, there remain two major issues that relate to the cross-linguistic, the inter-linguistic, and the intra-linguistic level. The first issue concerns the cross-linguistic generality of the claim that illocutionary force has to be marked explicitly by a syntactic mechanism such as verb movement. Proponents of these accounts must explain why (probably) a majority of languages does not show explicit marking for declarative assertions, how illocutionary force is activated in these cases, and why this presumably more economic mechanism is not available in V2-languages. The second issue concerns the correlation between formal properties of sentences (V1, V2, etc.) and their illocutionary force, which is not as uniform as we would expect. On the one hand, we have seen in Section 2.2 that German also exhibits independent utterances without verb movement (see Bayer 2004: 88–89). On the other hand, the mechanism seems to be language-specific because in Kashmiri several types of subordinate clauses (e. g. complement clauses and causal clauses) show obligatory V2-movement without being independent illocutions (Bhatt & Yoon 1991, Bhatt 1995, Koul & Wali 2015). If, however, the effect of verb movement is not uniform, it begs the question why V2-languages show such a similar behavior in root clauses.

2.3.7 Summary of the explanatory accounts

The accounts for V2 that have been discussed in this section can be divided into two groups. The syntactic accounts focus on the mechanisms that derive the correct word order patterns by specifying appropriate features in the respective positions. The semantico-pragmatic accounts, on the hand, try to connect these movement-triggering features with specific aspects of illocutionary properties of the sentences.

2.4 Chapter summary

The review of the observations about the V2-phenomenon showed that movement of the finite verb in main clauses can never be suspended. In Section 2.1.3, I discussed two configurations in which specific verb forms cannot move into the V2-position. Crucially, however, even in these configurations they cannot remain in their clause-final base position. Movement of phrasal constituents, on the other hand, seems to be much less general. V2-languages exhibit regular V1-structures as well as structures in which more than one element precedes the finite verb. Additionally phrasal movement seems to be directly related to interpretational properties of the elements involved, such as topicality, contrast, etc. Verb movement, in contrast, does not seem to have such a specific meaning component.

The examination in this chapter also showed that V2-order is only the most frequent pattern in main clauses but V1- and V3-orders also occur regularly in the languages at hand. The review of the theoretical accounts revealed that a more precise definition is that the finite verb moves to a certain position. This position is definable in relation to other constituents such as subject and topic, and we might call it the C-position. Constitutional for V2-languages is therefore the relation between the base position of the verb (V) and the high, left-peripheral position (C). This is the core insight of the den Besten (1983) analysis which remains the most accurate and economic analysis until today. I have indicated that a class of accounts try to establish a connection between the movement trigger and the illocutionary potential of matrix clauses. The hypothesis that will be presented in the next chapter complements these observations insofar as it indicates that V2-movement is triggered by an abstract feature which is tied to finiteness inflection in German. However, the remainder of this dissertation does not double down on the cause of V2-movement but focuses on the consequences especially for processing V2-clauses.

3 The V2-Reconstruction Hypothesis

In this chapter, I argue that verbs which are attracted by V2-movement have to be reconstructed into their base position for interpretation. Consequently, the lexical meaning of the finite verb is never interpreted in the overt V2-position. I start by motivating and specifying this hypothesis. Thereafter, I present empirical observations in support for the claims that verbs are not interpreted in V2-position (Section 3.2) but that the verb must be interpreted in its base position (Section 3.3). In Section 3.4, I present the results of an acceptability study which investigates claims concerning periphrastic *tun*, thereby backing up the analysis of Section 3.2. The last section summarizes the results and addresses its consequences.

3.1 Defining the V2-Reconstruction Hypothesis

3.1.1 Introduction

Based on the well-know and solid generalization that only finite verbs are subject to V2-movement, Bayer & Freitag (To appear) argue that V2-movement is essentially feature movement. The crucial features that are attracted are the finiteness features which are encoded by the inflection at the finite verb. The inflection, however, cannot be separated from the verb for reasons of morphological integrity. Therefore, the verbal stem that carries the inflection has to move as a whole: The verb is pied-piped. Crucially, even though the verb moves to a higher position, it is interpreted in its base position. This *V2-Reconstruction Hypothesis*[1] is given in (1).

(1) *V2-Reconstruction Hypothesis*
The finite verb that appears in 2nd position in a V2-language is in this position only for the reason of generalized pied-piping. Even when it is perceived in V2-position, its lexical part is evaluated in its base position, i. e. in German in clause-final position.
(Bayer & Freitag To appear: 3)

After a short note that clarifies the necessary concepts in relation to movement, reconstruction, and pied-piping, I will present empirical evidence in support for the V2-Reconstruction Hypothesis in the following two sections. In Part II of this dissertation, I will show that the V2-Reconstruction Hypothesis makes very accurate predictions for the sentence processing of German V2-clauses.

[1] *Conjecture about V2* in Bayer & Freitag (To appear).

3.1.2 A note on *movement*, *reconstruction*, and *pied-piping*

Movement can be considered as the establishment of a dependency between two syntactic positions. Such dependencies can be divided into two classes: first, movement which is accompanied by an amendment or a change in meaning and second, movement which has no identifiable effect on meaning. In the Minimalist framework (Chomsky 1995), the division between the two interface levels, the Phonetic Form (PF, perceptual-articulatory dimension) and the Logical Form (LF, the conceptual dimension), has been proven to be very useful for the understanding of such dependencies. The two types of movement are assumed to exhibit different requirements at the interfaces, such that the meaning-sensitive movement takes place also at LF, whereas the meaning-insensitive movement only takes place at the PF-interface. The four possible combinations of these interface requirements are summarized in Table 3.1.

		PF	
		moved	**in-situ**
LF	**moved**	classical overt movement	covert movement
	in-situ	PF-movement (pied-piping)	in-situ-elements

Table 3.1: Types of movement

Why do elements move? In the minimalist framework, movement (or more appropriately *attraction*/*internal merge*) must be triggered by a strong uninterpretable feature. Such an [–interpretable] feature attracts the closest element that bears the appropriate feature to delete the [–interpretable] feature. In this way, an element is *moved* from its original position to the target position, where it is in some local relation to the attractor. The division of features into movement triggering [–interpretable] and non-triggering features [+interpretable] originates from a conceptual necessity of the derivational model. One should not be confused by the terminology (±interpretable) and assume that movement does not affect interpretation. Right the opposite is the case. Usually, movement is necessary to yield a grammatical/interpretable structure at all.

We can understand movement, or the establishment of a dependency between two syntactic positions, as a way to express two aspects of meaning with one syntactic object. For illustration, take the case of *wh*-fronting in (2). A declarative sentence, such as (2a) can be transformed into a *wh*-question by replacing a syntactic element by a respective *wh*-term, such as the subject in (2b) or the object in (2c) (the translations indicate the parallel structures in English). In *wh*-fronting languages, such as German and English, the highest *wh*-term must be placed in sentence-initial position.

(2) a. Also hat der Junge diesen Mann gekannt.
thus has the boy this man known
'Thus, the boy knew this man.'

b. *Wer* hat ~~wer~~ diesen Mann gekannt?
who.NOM has this man known
'Who knew ~~who knew~~ this man?'[2]

c. *Welchen Mann* hat der Junge ~~welchen Mann~~ gekannt?
which man has the boy known
'Which man did the boy know ~~which man~~?'

Examples (2a) and (2b), however, show that an object can be interpreted in the post-subject position. Therefore, the only properties that need to be interpreted sentence-initially in (2c) are the ones that are tied to the interrogative meaning. Following standard assumptions, I assume that quantificational properties are computed at the fronted position, e. g. scope. At the base position, the thematic properties of the object are interpreted, as schematized in (3), see also Sportiche (2006: 40–41).

(3) $[\text{WH+Object}]_1$ Subject Verb_{eng} ~~Object~~$_1$ Verb_{deu}
quantificational properties thematic properties

Example (4) illustrates the effect of scope marking: In both variants, the *wh*-term is related to the object of the embedded clause. In (4a), the *wh*-element only scopes over the embedded clause. Hence, the matrix clause is still declarative. In (4b), on the other hand, the *wh*-element is moved to the sentence-initial position where it scopes over the matrix and the embedded clause. Hence, the whole sentence is an interrogative clause. Due to the identical base position of the *wh*-elements in both sentences, the difference in meaning stems from the different target positions of the moved elements.

(4) a. Also hat die Professorin erzählt, *welchen Mann* der Junge ~~welchen Mann~~ gekannt
thus has the professor told which man the boy known
hat.
has
'Thus the professor told which man the boy knew ~~which man~~.'

b. *Welchen Mann* hat die Professorin erzählt, dass der Junge ~~welchen Mann~~ gekannt
which man has the professor told that the boy known
hat?
has
'Which man did the professor tell that the boy knew ~~which man~~?'

Overt movement results in a situation in which we have multiple positions for interpretations but only one position in which the respective element is spelled out. This connection has been covered by all theories of movement but is handled most elegantly by the copy theory of movement: Movement creates a copy of the moved material in the target position. Usually, only one of this copies is spelled out at PF – under normal conditions the highest of all copies.

[2] Clearly, the verb moved at least from V-to-I in English subject-questions. Whether it also moves from I-to-C or not is of no particular interest here.

Now, we can evaluate whether there is movement only at PF without a semantic motivation. The answer is yes. It is actually very common that movement affects larger parts than only the element which bears the attracted feature. This phenomenon is known under the term *pied-piping* (going back to Ross 1967: 196–240). As I have shown above, the nominal object [$_{DP}$ Det *boy*] can be interpreted in-situ, i. e. in its post-subject base position. The reason why *wh*-terms such as *which boy* move is that *which* has to move and *which* and *boy* have to be connected by some mechanism. What would be minimally needed for a structure as (5a) is something like the structure in (5b), where the indices indicate the association of the two elements.

(5) a. *Welchen Mann* hat der Junge ~~welchen Mann~~ gekannt?
which man has the boy known
'Which man did the boy know ~~which man~~?'

b. * *Welchen*$_i$ hat der Junge ~~welchen~~ Mann$_i$ gekannt?
which has the boy man known
'*Which did the boy know ~~which~~ man?'

However, frequently, we observe that movement affects larger parts than actually expected, such as in (5a). In such cases, we say that *boy* is pied-piped by the element *which*. The element *boy* does not move because it bears the attracted feature but because it stands in a relation with an element that bears such a feature. The reason why *boy* moves together with *which* is that the relation between these two elements must not be broken by destroying their local configuration. In (5a) the pied-piping element is the phrase structural head that takes its complement along. The same element may also pied-pipe an exponent of a higher structure, such as in (6). The determiner *which* is a complement to the head *mit* 'with'. Nevertheless, in German, such a preposition cannot be left behind, as in (6b) but must be fronted along with the DP, as in (6c). The rationale is the same here: The local relation between the preposition and its complement DP must not be destroyed (see Bayer & Bader 2007). Under certain conditions, however, we observe *split phenomena*, for example preposition stranding in English (Hornstein & Weinberg 1981), indicated by the grammatical translation in (6b), or *was-für*-splits in German (den Besten 1985).

(6) a. Dann hat der Junge mit diesem Mann telefoniert.
Then has the boy with this man called
'Then the boy talked to this man over the phone.'

b. * *Welchem Mann* hat der Junge [mit ~~welchem Mann~~] telefoniert?
which man has the boy with called
'Which man did the boy talked to ~~which man~~ over the phone?'

c. *Mit welchem Mann* hat der Junge [~~mit welchem Mann~~] telefoniert?
with which man has the boy called
'To which man did the boy talked ~~to which man~~ over the phone?'

If an element has moved but is interpreted in a position in which it has been "before", we say it has been *reconstructed*. Reconstruction has been discussed almost exclusively for

phenomena including binding and scope relations (i. e. quantificational operators), and this for a good reason: binding and scope require a c-command relation between two elements, i. e. a specific hierarchical configuration. This requirement for c-command acts as a robust diagnostic for the actual position of interpretation. Therefore, reconstruction might apply in many more cases for which we just lack a diagnostic to properly identify it (see Chomsky 1976: 332–336, Huang 1993, Bayer 1993: 23–27, and Sportiche 2006 for a comprehensive overview of reconstruction).

Classic examples to illustrate reconstruction effects are condition C violations.[3] Consider example (7). In (7a) the pronoun *ihn* 'him' can be coreferent with *Uwe* because only the phrase containing the R-expression *Uwe* c-commands the pronoun. In (7b), on the other hand, the subject pronoun *er* 'he' cannot be coreferent with *Uwe* because the pronoun now asymmetrically c-commands the R-expression, which violates principle C.

(7) a. Also hat [[Uwes$_i$] Chefin] ihn$_{i/j}$ angerufen.
thus has Uwe's boss him called
'Thus Uwe's$_i$ boss called him$_{i/j}$.'

b. Also hat er$_{*i/j}$ [[Uwes$_i$] Chefin] angerufen.
thus has he Uwe's boss called
'Thus, he$_{*i/j}$ called Uwe's$_i$ boss.'

Now, consider example (8), in which the complex DP *Uwes Chefin* 'Uwe's boss' is fronted into Spec-CP (topcalized). In (8a), the fronting does not alter the c-command relation between the R-expression and the object pronoun: Spec-CP as well as the subject position c-command the object position. In (8b), on the other hand, the overt position of the R-expression, Spec-CP, is not in the c-command domain of the subject pronoun *er* 'he' but only the base position of the object. Nevertheless, we observe the same coreference options as in (7b), which indicates that binding is evaluated with respect to the base position of moved constituents.

(8) a. [Uwes$_i$ Chefin] hat [~~Uwes$_i$ Chefin~~] ihn$_{i/j}$ angerufen.
Uwe's boss has him called
'Uwe's$_i$ boss called him$_{i/j}$.'

b. [Uwes$_i$ Chefin] hat er$_{*i/j}$ [~~Uwes$_i$ Chefin~~] angerufen.
Uwe's boss has he called
'It was Uwe's$_i$ boss he$_{*i/j}$ called ~~Uwe's boss~~.'

Also relevant in the context of the V2-Reconstruction Hypothesis is the observation that movement which involves (parts of) predicates must obligatorily reconstruct, also in cases of phrasal A-bar movement such as VP-topicalization or topicalization of a predicative adjective (Heycock 1995, Sportiche 2006: 61–62). Hence, V2-moved finite verbs are in good company. Furthermore, Sauerland & Elbourne (2002) argue that (total) reconstruction applies only to cases of PF movement, such as pied-piping. Therefore, two aspects of the V2-Reconstruction

[3] This refers to Principle C of the Binding Theory: R(eferential)-expressions, such as the proper name *Uwe*, must be free, i. e. must not be c-commanded by a coreferential element (Chomsky 1981: 101–103, 188).

Hypothesis receive independent support: Verbs as well as pied-piped elements reconstruct, therefore it is very likely that pied-piped verbs will do so too.

Movement which takes place at both levels, on the surface (PF) and accompanied by a change in meaning (LF), triggers two interpretation processes in language comprehension. In the literature on sentence processing this has been extensively studied under the term *filler-gap dependency* (see Section 4.2.2). Oversimplified, the processor computes one set of properties in the target position and another set of properties in the base position, as illustrated for quantificational properties and thematic properties in (3) and (4).

3.1.3 Outlook

The V2-Reconstruction Hypothesis actually consists of two interrelated claims: First, the lexical content of the finite verb is only pied-piped to the C-position. Second, the finite verb undergoes obligatory reconstruction, i. e. it is interpreted in its base position. In the following, I will lists several empirical phenomena in support of the V2-Reconstruction Hypothesis by providing independent evidence for the validity of both claims.[4] The arguments of the first class support the claim that only the finiteness features are attracted by V2-movement and not (the lexical content of) the verb (Section 3.2). I discuss particle verbs, periphrastic-*tun* constructions, verb doubling constructions, Frisian *wer*-insertion, and complementizer agreement. They all have in common that finiteness features are expressed in the C-domain although the lexical verb (or parts of it) is present in the clause-final base position or in Spec-CP. The second class of observations, Section 3.3, contains association with focus, verbal negative polarity items, and sentential negation. These have in common that they require configurations in which the finite verb must be c-commanded by a certain operator. Crucially, only the clause-final base position but not the C-position lies within the c-command domain of the respective operators. This indicates that the meaning of the verb is interpreted in the clause-final position. Thus, these two complementary classes of arguments provide support for the two basic assumptions of the V2-Reconstruction Hypothesis: Movement only targets the finiteness features and the verb has to be reconstructed for semantic interpretation.

3.2 The C-position: Challenging a lexical contribution at the surface position

3.2.1 Particle verbs: V-to-C as movement of phonological words

German exhibits a class of complex verbs, so called particle verbs, which consist of a verbal base and a prefixed particle, usually of prepositional origin. If V2-movement applies to a finite particle verb, only the inflected verbal base moves to the V2-position. The particle

[4] The arguments in Section 3.2 and Section 3.3 will be published in Bayer & Freitag (To appear). Some of those observation were adapted from an earlier manuscript (Bayer 2008), namely periphrastic *tun* (Section 3.2.2), verb doubling (Section 3.2.3), association with focus (Section 3.3.1), and negative polarity items (Section 3.3.2).

remains stranded in the base position, as illustrated in (9a) and (9b). The combination of particle and verb can be transparent, as in (9), and related lexemes, such as *abkaufen* (of+buy 'buy from so.'), *ankaufen* (on+buy 'purchase'), or *zukaufen* (to+buy 'buy in addition'), which are all flavors of buying. The particle verb in (10) is an example of a non-compositional meaning, *auf-führen* (on-lead) 'perform'.

(9) a. Uwe kauft einen Apfel ein.
Uwe buys an apple in
'Uwe buys an apple.'

b. … dass Uwe einen Apfel einkauft.
that Uwe an apple in.buys
'… that Uwe buys an apple.'

(10) Nicole führt eine Oper auf.
Nicole leads an opera on
'Nicole performs an opera.'

The contrast pair in (11) shows that one and the same combination of particle and verb *ab-hauen* (off+chop) can have a compositional meaning 'chop off' as in (11a) or it can have an idiosyncratic meaning 'leave quickly' as in (11b).

(11) a. Sie haut den Ast mit einer Axt ab.
she chops the branch with an axe off
'She chops off the branch with an axe.'

b. Sie haut vor der Polizei ab.
she chops from the police off
'She leaves quickly from the police.'

All the examples above illustrate that V2-movement does not target the semantic word but a smaller unit. This implies that the verb cannot be interpreted in C because it is incomplete. Kremers (2009) proposes to capture the regularities of particle verb movement by mapping rules between the syntactic and the phonological structure.[5] The relevant units for the mapping in the present discussion are phonological phrases (φ), which typically correspond to syntactic phrases, and prosodic words (ω), which typically correspond to syntactic heads. Kremers (2009) assumes that particle verbs consist of two separate prosodic words, one for the verb and one for the particle, as illustrated in (12) as an analysis of (9b). The particle verb as a whole is a phonological phrase.[6]

[5] In Chapter 4, I will introduce a similar mapping for language processing (comprehension).

[6] Kremers (2009) formulates conditions and mapping restrictions to cover the observation that particles of particle verbs behave like phrases if they are separated from the verbal base, as indicated by adverbial modification, whereas they behave like heads if they appear adjacent to the verbal base, where they cannot be modified, as shown in (i.b) and (ii.b). Note, however, that additional movement of the particle (verb raising) is necessary to yield this contrast in (ii.b), i. e. modification of the particle is fine in the non-derived base position, as in (ii.a) and (iii.a). The respective contrasts in German, however, seem to be very subtle if at all present, as indicated in (iii).

(12) Uwe einen Apfel ein kauft
{ ω }$_{\varphi}$ { ω ω }$_{\varphi}$ { ω ω }$_{\varphi}$

The analysis of particle verbs as two separate prosodic words also offers an explanation for the observation that inflectional morphemes, such as the infinitive marker *zu* 'to', may attach directly to the verb, thereby intervening between particle and verb, as shown in (13).

(13) ohne einen Apfel ein-zu-kaufen
without an apple in-to-buy
'without buying an apple'

The observation that V2-movement only targets the verbal base of particle verbs can now be expressed by a mapping rule, as in (14). This rule states that the C-position is a head position that may only be filled by a single head that maps onto a single prosodic word (ω). There is no room for two prosodic words or a phonological phrase. Hence the particle must remain in its underlying position.

(14) C $\leftrightarrow$ ω
(Kremers 2009: 92)

In this section, I have pointed out two generalizations concerning particle verbs: First, the separability of particle verbs by V2-movement is independent of semantic compositionality. Second, V2-movement targets only the smallest possible unit, i. e. a prosodic word.

(i) a. *John threw the ball (right) in.*
b. *John threw (*right) in the ball.*
(see Kremers 2009: 86)

(ii) *Dutch*
a. *... dat Jan de bal (vlak) over geschoten heeft*
that Jan the ball right over shot has
'... that John kicked the ball just over the goal'
b. *... dat Jan de bal t_1 heeft [(*vlak) over geschoten]$_1$*
that Jan the ball has right over shot
c. *... dat Jan de bal (vlak) over t_1 heeft [geschoten]$_1$*
that Jan the ball right over has shot
(see Kremers 2009: 86)

(iii) *German*
a. *... dass Jan den Ball (richtig) drübergeschossen hat.*
that Jan the ball right over shot has
'... that Jan shot the ball right over (the goal)'
b. *[(Richtig) drüber]$_1$ hat Jan den Ball t_1 geschossen.*
right over has Jan the ball shot.
'Jan shoots the ball right over (the goal).'
c. *[(?Richtig) drübergeschossen]$_1$ hat Jan den Ball t_1.*
right over shot has Jan the ball

These two generalizations indicate that V2-movement is a semantics-free operation based on morphophonological properties (more on the perspective of interpreting particle verbs is discussed in Section 4.3.4). The conclusion about particle verbs is in line with the V2-Reconstruction Hypothesis in (1): V2-movement is a mechanism to bring finiteness features into the C-position. Aspects of verb are of no importance. Consequently, the meaning of particle verbs, compositional or idiomatic, is interpreted in the clause-final base position.

3.2.2 Semantically empty host I: Periphrastic *tun*

German exhibits several constructions with the verb *tun* 'do'. Very common are light verb constructions as in (15).

(15) a. einen Gefallen tun
a favor do
'do a favor'

b. Leid tun
sorrow do
'be/feel sorry'

Despite these expressions, certain registers and dialectal variants also allow the *tun*-periphrasis. In such constructions, *tun* cooccurs with another verbal element and functions as a finite auxiliary (Fischer 2001). It has been noted that, in some dialectal variants, the *tun*-periphrasis may be used to express conjunctive and to mark aspect (Abraham & Fischer 1998, Kölligan 2004, Schwarz 2004). I will exclude those cases from the discussion and focus solely on the indicative use.

The *tun*-periphrasis is more frequent with *tun* in V2-position[7], as in (16a), but is also acceptable in V-final position, as in (16b).

(16) a. Der Junge tut gerade die Wand streichen.
the boy does currently the wall paint
'Currently the boy is painting the wall.'

[7]The *tun*-periphrasis also occurs in the C position in V1-clauses, such as in the imperative and interrogative clauses in (i), see also Erb (2001: 183-191) for the compatibility with any sentence type.

(i) a. *Imperative*
Tut euch nich bekleckern
do you not blot
'Don't blot yourselves!'

b. *Interrogative*
Tust du pflügen?
do you plow
'Do you plow?'
(Abraham & Fischer 1998: 38, 40)

b. Ich glaube, dass der Junge gerade die Wand streichen tut.
I believe that the boy currently the wall paint does
'I believe that boy is currently painting the wall.'

It must be noted that the periphrastic construction is a fully optional variant[8] to an inflected lexical verb. Abraham & Fischer (1998) assume that the *tun*-insertion is primarily a means of receiving neutral accent on the clause-final verb. This explains why *tun* appears more frequently in V2-position than in V-final position. Accordingly the *tun*-periphrasis is quite unacceptable in combination with periphrastic tense forms that already involve an auxiliary (Abraham & Fischer 1998: 37).

Crucially, the use of periphrastic *tun* is semantically/pragmatically restricted. The exact classification in the literature differs slightly: agentive vs. non-agentive verbs (Fischer 2001: 40), eventive vs. stative verbs (Maienborn 2003: 54–63, Rothmayr 2009: 28–31, Hoekstra 2016: 342), telic vs. atelic verbs (Schönenberger & Penner 1995: 318–319), and individual-level vs. stage-level predicates (Bayer & Freitag To appear). The discussion and the results of Experiment 1 (Section 3.4) will reveal that the situation is more complex than a 2-way distinction. It will turn out that only a subgroup of stative verbs do contrast significantly with agentive verbs, as predicted by Maienborn (2003) and Rothmayr (2009). The validity of the present argument, however, does not hinge on the exact characterization of the predicate classes. For simplicity, here, I will follow the characterization of Bayer & Freitag (To appear) that periphrastic *tun* is compatible with stage-level predicates but incompatible with individual-level predicates.[9] The incompatibility of individual-level predicates *own*, *resemble* and *lie on a lake* is illustrated in (17) in contrast to the non-periphrastic equivalents in (18).

(17) a. * Der Junge tut einen guten Charakter besitzen.
the boy does a good character own
'The boy has a good character.'

b. * Der Junge tut seinem Vater ziemlich ähneln
the boy does his father much resemble
'The boy resembles his father quite a lot.'

c. * Konstanz tut am Bodensee liegen
Constance does at the Lake Constance lie
'Constance lies on Lake Constance.'

[8] Despite its superficial similarity, the *tun*-periphrasis is not comparable to the English *do*-support. They have in common that they are elements for the realization of finiteness features and can be replaced by modal verbs or other auxiliaries, thereby receiving a different interpretation. They differ in their distribution: English *do*-support (in absence of another non-thematic verbs) is obligatory in *wh*-questions and with sentential negation. In German there is no need for an expletive auxiliary in those environments. German requires an expletive auxiliary in case of a topicalized verb to satisfy the V2-requirement, which lacks an equivalent in English.

[9] In a nutshell, *stage-level predicates* describe temporary or transitory properties, such as *jump* or *being hungry*, whereas *individual-level predicates* denote rather permanent properties, such as *being smart* (see Kratzer 1995).

(18) a. Der Junge besitzt einen guten Charakter.
the boy owns a good character
'The boy has a good character.'

b. Der Junge ähnelt seinem Vater ziemlich.
the boy resembles his father much
'The boy resembles his father quite a lot.'

c. Konstanz liegt am Bodensee.
Constance lies at the Lake Constance
'Constance lies on Lake Constance.'

The same effect can be observed for VP-pronominalization (Hoekstra 2016: 342). In coordinations, the VP of the second conjunct can, under identity, be expressed by a weak pronoun *es* or a d-pronoun *das*. The position of the finite verb in the second conjunct is filled with a periphrastic *tun*, as shown in (19) with the stage-level predicate *paint*.

(19) Der Junge streicht [$_{VP}$ gerade die Wand ~~streicht~~]$_i$ und seine Nachbarin tut es$_i$/das$_i$ auch.
the boy paints currently the wall and his neighbor does it/that too
'The boy paint the wall and his neighbor does so/it too.'

The examples in (20) show that this very construction is impossible with individual-level predicates. Furthermore, the contrast in (21) shows that individual-level predicates are not incompatible with VP-pronominalization as such. If periphrastic *tun* is replaced by an auxiliary or modal verb, VP-pronominalization is acceptable.

(20) a. Der Junge besitzt [einen guten Charakter ~~besitzt~~]$_i$ (*und seine Freundin tut es$_i$/das$_i$ auch).
the boy owns a good charackter and his girlfriend does it/that too
'The boy has a good character and his girlfriend (*does so) too.'

b. Der Junge ähnelt [seinem Vater ziemlich ~~ähnelt~~]$_i$ (*und sein Bruder tut es$_i$/das$_i$ auch).
the boy resembles his father much and his brother does it/that too
'The boy resembles his father quite a lot and his brother (*does so) too.'

c. Konstanz liegt [am Bodensee ~~liegt~~]$_i$ (*und Friedrichshafen tut es$_i$/das$_i$ auch).
Constance lies at the Lake Constance and Friedrichshafen does it/that too
'Konstanz lies on Lake Constance and Friedrichshafen (*does so) too.'

(21) a. Der Junge könnte [einen guten Charakter besitzten]$_i$ (und seine Freundin müsste
the boy could a good charackter own and his girlfriend must
es$_i$/das$_i$ auch).
it/that too
'The boy could have a good character and his girlfriend should have one too.'

b. Der Junge hat [seinem Vater ziemlich geähnelt]$_i$ (und sein Bruder hat es$_i$/das$_i$
the boy has his father much resembled and his brother has it/that
auch).
too
'The boy resembled his father quite a lot and his brother did too.'

c. [In a guessing game or riddle]
Konstanz muss [am Bodensee liegen]$_i$ (und Friedrichshafen muss es$_i$/das$_i$
Constance must at the Lake Constance lie and Friedrichshafen must it/that
auch).
too
'Constance have to lie on Lake Constance and Friedrichshafen have to too.'

A similar contrast arises in pseudoclefts.[10] Again, stage-level predicates, as in (22), are fine, whereas individual-level-predicates in (23) are out.

(22) Was der Junge tat, war die Wand streichen.
what the boy did was the wall paint
'What the boy did was paint the wall.'

(23) a. * Was der Junge tat, war einen guten Charakter besitzen.
what the boy did was a good character own
'What the boy did was have a good character.'

b. * Was der Junge tut, ist seinem Vater ziemlich ähneln.
what the boy does is his father much resemble
'What the boy does is resemble his father quite a lot.'

c. * Was Konstanz tut, ist am Bodensee liegen.
what Constance does is at the Lake Constance lie
'What Constance does is lie on Lake Constance.'

The data indicates that periphrastic *tun* is not completely semantically empty but retains some meaning that renders it incompatible with individual-level predicates. This is the result of an automatic reconstruction into its clause-final position where the semantic restriction is evaluated in the verbal complex.

Crucially, however, the semantics of *tun* can be suspended. This is the case in VP-topicalization, as shown in (24) with individual-level predicates.

(24) a. [$_{VP}$ Einen guten Charakter besitzen] tut der Junge auf alle Fälle.
a good character own does the boy in any cases
'The boy has a good character in any case.'

[10] See Iatridou & Varlokosta (1998) for an overview of this construction.

b. [$_{VP}$ Seinem Vater ähneln] tut nur der Junge.
his father resemble does only the boy
'Only the boy resembles his father.'

c. [$_{VP}$ Am Bodensee liegen] tut Stuttgart zum Gück nicht.
at the Lake Constance lie does Stuttgart luckily not
'Luckily, Stuttgart does not lie on Lake Constance.'

What is the difference between these constructions and the other uses of periphrastic *tun*? In VP-topicalization, the thematic verb and, optionally, also other elements within the VP move to Spec-CP. This is unproblematic with analytic verb forms, as in (25). Here, the auxiliary carries the finiteness features and moves to C. Things are different with synthetic verb forms. When the predicate has been moved to Spec-CP, no finite verb is left to satisfy the V2-requirement, as illustrated in (26b). The finiteness features also cannot occupy the C-position alone, as indicated in (26c), because of morphological integrity. In this case, *tun* is inserted as a host for the finiteness features as a *last resort operation*, yielding (26d). In contrast to the optional cases of periphrastic *tun* above, *tun*-insertion to satisfy the V2-requirement in VP-topicalization is obligatory.

(25) [Gestrichen]$_1$ hat$_2$ der Junge die Wand ~~gestrichen~~$_1$ ~~hat~~$_2$.
painted has the boy the wall
'The boy painted the wall.'

(26) a. (dass) der Junge die Wand streich-t
that the boy the wall paint-3SG

b. * [$_{Spec\text{-}CP}$ streich-t$_1$] [$_C$ ∅] der Junge die Wand ~~streich-t~~$_1$.
paint-3SG the boy the wall

c. * [$_{Spec\text{-}CP}$ streich$_1$] [$_C$ ∅-t$_2$] der Junge die Wand ~~streich~~$_1$ ~~-t~~$_2$.
paint 3SG the boy the wall

d. [$_{Spec\text{-}CP}$ streich$_1$-en] [$_C$ tu-t$_2$] der Junge die Wand ~~streich~~$_1$ ~~-t~~$_2$.
paint-INF do-3SG the boy the wall
'The boy paints the wall.'

The VP is fronted for information structural reasons, such as emphasizing a contrast, as illustrated in (27).[11] *Tun* must be inserted into C in order to satisfy the V2-requirement. It

[11] Parts of the verb can also receive information structural marking in canonical word order, such as contrastive focus on the thematic verbs in clause-final position in (i.a). Even *tun* can receive the main accent to mark verum focus, as shown in (i.b). The semantics of *tun*, however, is still active, as illustrated in (ii).

(i) a. *Contrastive focus*
Wir tun heut noch SÄEN, PFLÜGEN *und* FÜTTERN.
We do.1PL today still sow.INF plow.inf and feed.inf
'Today we still do sow, plow, and feed.'

b. *Verum focus*
Ich TU *ja schreiben.*
I do.1SG PRT write.INF
'I do write.'

does not originate from a lower projection and cannot be reconstructed into the clause-final position. Therefore, no semantic incongruity with individual-level predicates arises. VP-topicalization thus further supports the hypothesis that *V2* is actually *Features2*. No lexical verb has to take part in V2-movement.

(27) Ich liebe dich noch immer, aber [mögen]$_1$ tu ich dich schon lang nicht mehr
I love you still but like.INF do.1SG I you for a long time not anymore
~~mögen~~$_1$.

'I still love you but I stopped liking you a long time ago.' (http://www.neon.de/artikel/fuehlen/liebe/am-ende-bleibt-nur-das-vermissen/1013639, access: 02.08.2017)

3.2.3 Semantically empty host II: Verb doubling

A peculiar variant of VP-topicalization is found in a number of German dialects. In contrast to VP-topicalization with *tun*-insertion, the fronted infinitive is accompanied by the finite form of the same lexical verb in V2-position, as illustrated in (28). Fleischer (2008) call this construction *topikalisierende Infinitivverdoppelung* 'topicalizing infinitive doubling'.

(28) a. VP-topicalization with verb doubling (NON-STANDARD GERMAN)
Trink-en trink-t er nicht, aber rauch-en rauch-t er.
drink-INF drink-3SG he not but smoke-INF smoke-3SG he
'He doesn't drink but he smokes.' (Fleischer 2008: 247-248)

b. VP-topicalization with *tun*-insertion (STANDARD GERMAN)
Trink-en tu-t er nicht, aber rauch-en tu-t er.
drink-INF do-3SG he not but smoke-INF do-3SG he
'He doesn't drink but he smokes.'

Note that modals, auxiliaries, and periphrastic *tun* allow the embedding of infinitives. These infinitives may be lexically identical to the embedding predicate, as in (29a). Accordingly, such self-embedding leads to patterns that are superficially very similar to cases of verb doubling. Self-embedding can, however, be differentiated by examples like (29b), which show that it may also appear in a V-final clause. In contrast, the doubled verbs in (28a), *trinken* 'drink' and *rauchen* 'rauchen' do not allow embedding of infinitives at all. Thus, verb doubling does not occur in clause-final position.

(29) a. Könn-en kann er, aber woll-en will er nicht.
can-INF can.3SG he but want-INF want.3SG he not
'He could be able to do it but he is not willing to want to do it.' (Fleischer 2008: 246)

(Abraham & Fischer 1998: 41 nach Eroms 1984)

(ii) * *Der Junge* TUT *ja einen guten Charakter besitzten.*
the boy do.3SG PRT a good character own.
'The boy does have a good character.'

b. Es ist doch klar, dass ein Kind in dem Alter das noch nicht könn-en kann.
It is PART clear that a child in this age that yet not can-INF can.3SG
'It is obvious that a child of this age cannot be able to do this.'

In his detailed survey, Fleischer (2008) reports that this construction was spread over the German language area: The northern end consists of the Berlin dialect as well as archaic peripheral varieties of Prussian. On the southern end it is attested in High Alemannic of Grisons (Switzerland), where it seems to be restricted to auxiliaries, mostly *be*, as in (33) (see also Glaser & Frey 2007). Additionally, the phenomenon is attested in several diasporic German minority dialects, which have survived in the former Soviet Union.[12]

The use of the VP-topicalization with verb doubling is the same as with *tun*-insertion. Fleischer (2008) states that verb doubling is functionally equivalent to *tun*-insertion, i. e. it is assigning a special information structural status to the fronted VP. This is further supported by examples that show both forms contrasting in one sentence, as in (30).

(30) a. PRUSSIAN
Schnuw-e schneff-t he nech, aber preem-e dei-t he färchterlich.
Schnupf-en schnupf-t er nicht aber priem-en tu-t er fürchterlich.
snuff-INF snuff-3SG he not but chew tobacco-INF do-3SG he horribly
'He doesn't snuff but he chews tobacco horribly.'

[12] Koopman (1984: 37–38, 151–186) describes a very similar phenomenon under the term *predicate cleft construction*. She notes that this construction can be found in many African languages and many Caribbean creoles (Koopman 1984: 154). In the Kru lanaguage Vata, for example the verb gets focused by placing it in clause-initial position. Crucially, a copy of the verb is present in its unmarked position within the clause, as shown in (i). Note that the fronted verb may appear in the imperfective form *lē*, as in (i.a), or in the base form *lī*, as in (i.b), but never in the perfective form *lì*, as in (i.c). This parallels the verb doubling cases: In the left periphery only a base form is required, which represents the lexical meaning of the verb. The lower copy is the host for the phi-features. Note further that in Vata, too, only one of the verb forms can be semantically active because 'eat' does not embed clausal units, i. e. the predicate cleft construction is independent of the argument structure of the verb involved (Koopman 1984: 157).

(i) *VATA*
a. *lē à lē sȧ́ká*
eat we eat rice
'We are really EATING rice' or 'We are eating rice.'.
b. *lī Ó dā sȧ́ká lī*
eat she/he AUX.PERF rice eat
'She/He has EATEN rice.'
c. *lī Ó lì sȧ́ká*
eat she/he ate rice
'She/He ATE rice.'
(Koopman 1984: 38)

Katja Jasinskaja (p. c.) pointed out that verb doubling constructions are also common in Slavic languages (see Karagjosova & Jasinskaja 2015 and references therein) and crosslingustically, their presence may be rather the rule than the exception (see also Jouitteau 2012: 155–157 and references therein).

b. Issime (High Allemannic)
Tringe tringt=er nöid, wa röike tut=er.
trinken trinkt=er nicht, aber rauchen tut=er
drink.inf drinks=he not but smoke.inf does=he
'He doesn't drink but he smokes.'
(Fleischer 2008: 252)

In Yiddish, a V2-language with partial German origin, verb doubling is attested too. As can be seen in (31a), only the verb or larger parts of the VP may be topicalized, as in (31b).

(31) Yiddish
a. Ess-en es-t Maks fish.
eat-inf eat-3sg Max fish
'As for eating, Max eats fish'
b. [Ess-en fish] es-t Maks.
eat-inf fish eat-3sg Max
'As for eating fish, Max eats them'
(Cable 2004: 2)

Yiddish also exhibits a particular phenomenon that sheds light on the mechanism underlying the doubling mechanism. For verbs whose paradigm involves suppletive forms or ablaut, the topicalized infinitive may be realized as a *pseudo-infinitive*, which consists of the stem variant of the inflected form to which the infinitive suffix is added, as illustrated in (32) (Fleischer 2008: 260–261).

(32) Yiddish
a. gib-n gib ikh (correct infinitive: *geb-n*)
give-inf give.3sg I
'I give'
b. veys-n veys ikh (correct infinitive: *vis-n*)
know-inf know.1sg I
'I know'
c. bin-en bin ikh (correct infinitive: *zay-n*)
am-inf am I
'I am'
d. iz-n iz er (correct infinitive: *zay-n*)
is-inf is he
'He is.'
(Fleischer 2008: 260)

These pseudo-infinitives indicate that the source of the fronted infinitive is the finite verb from the V/I position. As I have exemplified in (26), the verb stem moves to Spec-CP, where the infinitive suffix is added. Somehow certain languages seem to apply a filter that excludes illicit infinitives, as shown in (33), whereas Yiddish seems to lack such a *smoothing device*.

(33) Alemannic

a. Syn bischt schoon albig der glych verdamt Schelm!
be.inf be.2sg still always the same damned rogue
'You are still the same old rogue!' (Fleischer 2008: 248) (area: Splügen, Davos)

b. Sii bisch scho en Flissige.
be.inf be.2sg certainly a hard working
'You certainly work hard.' (Glaser & Frey 2007: 5) (area: Grisons)

The inevitable conclusion from verb doubling in the context of VP-topicalization is that the finite verb in the V2-position is a semantically empty copy which is inserted only to enable the spell-out of the finiteness features in C in order to satisfy the V2-requirement. Let's recapitulate the arguments: First, both copies of the verb cannot be semantically active because verb doubling does apply to verbs that do not allow the embedding of (bare) infinitives. Second, the topicalized phrase must not be semantically empty, otherwise the topic of the sentence would be empty. Third, the finite verb in V2-position can be replaced by an inserted *tun*, by modals, or auxiliaries, whereas the topicalized verb has to be proper lexicalized. Forth, Yiddish pseudo-infinitives provide empirical support for the assumption that the topicalized infinitive is the dislocated finite verb. In sum, the verb doubling phenomenon indicates that the V2-position must only be filled with finiteness features. This may be achieved by inserting semantically empty copies of the verb to provide a host for the relevant features. Thus, this adds further support to the V2-Reconstruction Hypothesis by indicating that the V2-requirement does not involve targeting a meaningful verbal element. Consequently, it is predicted that verb doubling cannot occur in the verb's base position, i. e. the position in which the semantics of the verb is active, such as the clause-final position in (34). This prediction is borne out because such cases seem to be non-existent (Bayer & Freitag To appear: 9).

(34) German

*Ich glaube, dass ihm das nichts schaden schadet.
I believe that him this nothing harm harms
'I believe that it doesn't harm him'. (Bayer & Freitag To appear: 9)

A somewhat comparable phenomenon are dummy auxiliaries, which are observed in L2-acquisition and are described in Section 9.2.2. They also seem to be semantically empty elements that are inserted in C. In contrast to verb doubling, dummy auxiliaries are only quasi-finite elements that do not show proper subject agreement.

3.2.4 Semantically empty host III: Frisian *wer*-insertion

In another West Germanic variety, we find additional evidence which indicates that the lexical content of the verb does not need to appear in the C-domain but only the finiteness features. Karrharde North Frisian[13] exhibits a periphrastic verb construction with a finite

[13]Frisian is closely related to low German and Dutch. It is a V-final V2-language that is spoken in the coastal area of the German Bight.

auxiliary *wer-* in V2-position and a thematic verb in base position. Like the *tun*-periphrasis, this construction appears in declaratives, *wh*-interrogative, polar interrogatives, and imperatives, as shown in (35). Moreover, this construction does generally not appear with other auxiliaries or modals. In contrast to the *tun*-periphrasis, the thematic verb in clause-final position is finite too. According to Hoekstra (2016), *wer-* insertion does not show semantic or pragmatic restrictions on the co-occurring verb classes. The syntactic distribution of *wer-*, however, is restricted to the V2-position. It never occurs in clause-final position. Hoekstra (2016) argues that *wer-* is not of verbal origin but stems from the interrogative complementizer *wer* 'if, whether'. The assumption that *wer-* is a reanalyzed complementizer that functions as a semantically empty auxiliary does account for all its properties: restriction to V2-position (C-position), complementary distribution with other auxiliaries in V2-position, no semantic/pragmatic restriction, and the double marking of finiteness on the auxiliary and the thematic verb. Due to its origin as a finite complementizer, *wer-* selects a finite VP, even in last resort cases, such as VP-topicalization in (36), whereas German *tun* selects a non-finite VP. Hoekstra (2016) calls the phenomenon *finite verb doubling* what I consider to be a misnomer for the following reasons: The only thing that appear twice is the finiteness morpheme. The thematic verb, however, appears only once, in contrast to *real* doubling of the verb stem as described in the previous section. Furthermore, *wer-* is actually not of verbal origin, which is (presumably) the crucial prerequisite for the double marking of finiteness.

(35) Karrharde North Frisian

a. Tėth-üttīnen wer-t er kan-d.
Teeth-pulling WER-PRS.3SG he know-PRS.3SG
'He knows how to pull teeth.' (Hoekstra 2016: 322)

b. Wat wer-e jem der apfask-e?
what WER-PRS.2PL you there up.fish-PRS.2PL
'What are you fishing up there?' (Hoekstra 2016: 323)

c. Denn wer-e man eg aw't Håd fāl-e.
then WER-IMP.PL only not on=the head fall-IMP.PL
'Then don't fall on your head.' (Hoekstra 2016: 325)

(36) Karrharde North Frisian
He es fallight ferkimen, an lait je sagt wer krōnk, an
he is maybe come down and lays really perhaps somewhere ill and
$[_{VP}$ sturwe-d$]_1$ wer-t ham niman t_1.
nurses-PRS.3SG WER-PRS.3SG him no one
'Maybe he has come down in the world and is perhaps ill in bed somewhere with nobody nursing him.' (Hoekstra 2016: 341)

Frisian *wer-*insertion therefore shows that the V2-position does not have to be filled with a genuinely verbal element. A suitable host for the inflectional affix appears to be sufficient. This fact agrees perfectly with the results of periphrastic *tun* and verb doubling.

3.2.5 Complementizer Agreement: Inflection on non-verbal C-elements

Another configuration, the so-called *complementizer agreement*, can be observed in embedded clauses of German and Dutch dialects. As with Frisian *wer*-insertion, the inflectional affix appears at the clause-final verb and on C-elements, i. e. complementizers and *wh*-pronouns as illustrated in (37).[14] Crucially, the subject agreement does not replace the verbal agreement affixes but appears additionally (Bayer 1984, Bennis & Haegeman 1984).

(37) Bavarian
I frog' me, ob-sd ned du des mocha kan-sd.
I ask myself, whether-2sg not you this make could-2sg
'I ask myself, whether you could not do this.' (Weiss 2005: 148)

The geographical distribution seems to be restricted to Continental West Germanic languages, i. e. varieties of German and Dutch. Most prominently, this phenomenon has been described for Bavarian (Bayer 1984), West Flemish (Haegeman 1992, Shlonsky 1994), and Frisian (de Haan 2010). Weiss (2005: 149–153) notes that in most dialectal variants (of German and Dutch) at least some kind of complementizer agreement can be observed even though there are dialects that lack this phenomenon entirely (see also Zwart 1993, Hoekstra & Smits 1998). The V2-property is commonly assumed to be a necessary prerequisite for complementizer agreement. Nevertheless, being a V2-language does not seem to be a sufficient condition because complementizer agreement has not been reported in for Scandinavian languages, North Italian varieties (Rhaeto-Romance), and Kashmiri.[15]

In most dialects, the agreement is paradigmatically defective (see Weiss 2005: 150–152 for an overview). Bavarian and Frisian, for example, display inflectional morphems only for 2nd person singular/plural. West Flemish, on the other hand, shows inflectional markers for all combinations of person and number, and distinguishes even gender in the 3sg (Bennis & Haegeman 1984: 41). Importantly, inflectional morphemes on the complementizers are restricted to categories of subject agreement (person and number) and never involve any tense features (den Besten 1983: 119). Moreover, complementizer agreement seems to be dependent on the formal marking of agreement on verbs: Hoekstra & Smits (1998) state that complementizer agreement only shows up for person/number combinations that exhibit the same person/number agreement morpheme in present and preterite forms of auxiliaries. This condition accounts for paradigmatic gaps of the individual dialectal variants.

Despite the term *complementizer agreement*, the inflectional affixes do not exclusively combine with complementizers but with the lowest element in the left periphery (Bayer 1984:

[14] This phenomenon therefore has to be distinguished from other instances of *complementizer agreement*. Kawasha (2007) for example describes a phenomenon in Bantu languages in which complementizers agree in person and noun class with the subject of the matrix clause. Furthermore, superficially similar phenomena in non-V2 languages differ considerably. Complementizer agreement in Nadji Arabic, as discussed in Lewis Jr. (2013), occurs only on specific lexical items, is optional, and uses non-verbal agreement morphemes.

[15] It must be noted, however, that some North Italian dialects, such as Cimbrian, show subject clitics at complementizers that introduce non-V2 clauses whereas enclisis is blocked in subordinate clauses with V2-order (Bidese et al. 2012, 2013). Kashmiri exhibits V2-order in most types of embedded clauses, which therefore are incompatible with complementizer agreement.

235). These might be complementizers, such as *dass* 'that' in (38a), *wenn* 'if' and *weil* 'because'. In absence of an overt complementizer, the affix may also attach to a *wh*-element, as shown in (38b) and (38c).[16]

(38) Bavarian

a. Du sollst song an wäichan Schua dass-st du wui-st
you should say a which one shoe that-2sg you want-2sg
'You should say which one of the shoes you want.' (Bayer 1984: 235)

b. Du sollst song wann-st du komm-st
you should say when-2sg you come-2sg
'You should say when you are going to come.'

c. I frog' me, warum-sd des ned moch-sd.
I ask myself, why-2sg this not make-2sg
'I ask myself why do you not do this.' (Weiss 2005: 148)

The relation of complementizer agreement and V2-movement can be captured by two generalizations: First, complementizer agreement is not optional but obligatory in dialects that allow it.[17] Second, complementizer agreement and verb movement are complementary distributed. The following examples from Bavarian with the causal complementizer *weil* 'because' illustrate the complementary distribution of inflectional morpheme and verb movement. If the complementizer is inflected for 2nd person, as in (39a), V2-order is impossible. With a non-inflected complementizer, as in (39b), verb movement is required.

(39) Bavarian

a. Des is schood, weil-st du ⟨*bist⟩ gestern a scho nit kemma ⟨bist⟩.
That is disappointing because-2sg you are yesterday also already not come are
'That is disappointing since you already didn't show up yesterday.'

b. Des is schood, weil du ⟨bist⟩ gestern a scho nit kemma ⟨*bist⟩.
That is disappointing because you are yesterday also already not come are
'That is disappointing since you already didn't show up yesterday.'

Even though we may assume that complementizer agreement originates from subject clitics, two properties distinguish them robustly: First, clitics are never obligatory whereas complementizer agreement is. Second, clitics do not double, whereas complementizer agreement usually cooccurs with overt subjects (Bayer 2014: 41–43), as shown in (38a) and (38b).

It is still debated whether complementizer agreement involves some kind of copy mechanism of the T-head's phi-features onto C (Fuß 2014), or whether it expresses a separate

[16] Bayer (2014: 41–44) states that only word-size *wh*-operators receive inflection suffixes. In case of phrasal *wh*-elements, insertion of the default complementizer *dass* 'that', as in (38a) provides a licit host for the inflectional morpheme.

[17] To my knowledge only Bayer (2014: 41) states explicitly that the complementizer agreement is obligatory in Bavarian. The same can (only) be inferred for the other dialects.

agreement relation between C (Fin) and the subject (Carstens 2003, Haegeman & van Koppen 2012). One observation, however, indicates that complementizer agreement cannot involve a *simple* copy mechanism of the verbal affix onto the complementizer. Some East Netherlandic dialects and Brabants show non-identical agreement morphemes on the complementizer and the verb (Zwart 1993, Hoekstra & Smits 1998), as illustrated by the contrasting morphemes *-(d)e* and *-t* in (40).

(40) a. East Netherlandic
... datt-e wij speul-t.
that-1pl we play-1pl
'... that we play.'

b. Brabants
... dad-de gullie kom-t.
that-2pl you come-2pl
'... that you come.'

(Zwart 1993: 253)

Interestingly, the distribution of these two morphemes[18] is not lexically specified. The examples in (41) and (42) show that both endings might appear on the verb. In non-subject-initial V2 matrix clauses, the finite verb in V2-position in (41a) and (42a) shows the same agreement morpheme (*-e*/*-de*) as the complementizers in the subordinate clauses in (40). In subject-initial V2 matrix clauses, as in (41b) and (42b), however, the inflectional morpheme is invariably *-t*, like on the clause-final verb in subordinate clauses in (40).

(41) East Netherlandic

a. Waar speul-e/*-t wij?
where play-1pl we
'Where do we play?'

b. Wij speult-t/*-e.
we play-1pl
'We play.'

(Zwart 1993: 254)

(42) Brabants

a. Waneer kom-de/*-t gullie?
when come-1pl you
'When do you come?'

b. Gullie kom-t/*-de.
you come-1pl
'You are coming.'

(Zwart 1993: 254)

[18] As long as we cannot specify any additional semantic contribution to the element in C, I assume that the C-inflection morpheme is an allomorph of the V-inflection morpheme. However, since the C-domain is a functional domain, we might expect some abstract semantic contribution to be there.

A similar dual agreement morpheme system is also found in Lower Bavarian for first person plural only (*-ma* vs. *-n*), as in (43a). In contrast to the Dutch variants above, the V2-verb exhibits the agreement morpheme of the complementizers (*-ma*) in both non-subject-initial clauses and subject-initial clauses, as shown in (43b) and (43c).

(43) Lower Bavarian

a. … dass-ma mir noch Minga fahr-n/*-ma.
that-1pl we to Munich drive-1pl
'… that we drive to Munich.'

b. Fahr-ma/*-n mir noch Minga?
drive-1pl we to Munich
'Do we drive to Munich?'

c. Mir fahr-ma/*-n noch Minga.
we drive-1pl to Munich
'We drive to Munich.'

(Bayer 1984: 251, Weiss 2005: 153–154)

Consequently, it is not evident what the contrast of the inflectional morphemes in East Netherlandic and Brabant indicate, given that we assume a basically identical syntactic structure as in Bavarian.

I interpret the inflectional morphemes on the complementizer as spell-out of the finiteness features of the verb, or more precisely the subset of subject-agreement features. The complementary distribution of complementizer agreement and V2-movement suggests that both satisfy the same requirement, i. e. the requirement for phi-features in the C-domain. Complementizer agreement shows that checking the phi-features in C does not have to be realized by verb movement: If the C-head is filled by a suitable host for the agreement features, verb movement is suspended. Thus, this observation provides further support for the V2-Reconstruction Hypothesis: V2-movement is not related to the meaning of the verb but only the phi-features of the finite verb are attracted and the lexical part of the verb is pied-piped.

3.2.6 Summary: Only agreement features in C

In this section, I have discussed four phenomena which illustrate that V2-movement is a semantics-free operation in the sense that the lexical content of the verb is not interpreted in C. The discussion of particle verbs revealed that V2-movement actually targets sub-semantic units, namely prosodic words. For reasons of economy, only the smallest part that can carry the finiteness feature moves to C, which is the prosodic word in case of particle verbs. The following three subsections illustrated alternative solutions for how semantically empty hosts for the agreement features can be provided if the lexical verb is not available, for example because of verb topicalization. One possibility is the insertion of a generalized, semantically empty dummy verb, such as the German *tun* 'do'. The second option is the doubling of the lexical verb. Crucially, those elements are only a host for the verbal agreement in C, as evidenced by their semantic emptiness: In the C-position, these elements do not contribute

their lexical meaning component and do not require that their argument frame must be satisfied. A third option is the insertion of the complementizer-like Frisian *wer*. In sum, these C-elements can be characterized as PF-related hosts for the verbal agreement features which have to be realized in the C-position, but due to their affixal nature (bound morphemes) they cannot appear in C on their own.[19] The last phenomenon, complementizer agreement, shed more light on that observation. In a suitable environment, the verb does not move at all. In presence of a complementizer, as in subordinate clauses, the verbal inflection appears at the complementizers, i. e. in C, without displacing the verb. In these cases the finiteness features are present on both, the C-head and the V-head. It became evident that the relevant part of the finiteness inflection is only the subject agreement, which must be realized at the C-head.

3.3 The base position: Arguments for the necessity of reconstruction

This section concentrates on the second claim of the V2-Reconstruction Hypothesis, namely that the finite verb is obligatorily interpreted in its base position. This is obviously true in V-final clauses. I will argue that, in V2-clauses, the finite verb obligatorily has to be reconstructed into its base position in order to be interpreted correctly with respect to the scope of semantic operators, such as focus-sensitive operators (Section 3.3.1), NPI-licensors (Section 3.3.2), and sentential negation (Section 3.3.3).

3.3.1 Association with focus

A first diagnostic which shows that the finite verb must be interpreted in the base position is *association with focus*. Semantic operators operate on elements in their scope domain. Focus-sensitive operators do even interact with the focus-background structure within their arguments. Focus particles such as *nur* 'only', *lediglich* 'solely', and *negative constrastive construction* (Drubig 1994: 28–37) are examples for such an association with focus, as shown in (44). Crucially, the truth conditions of the sentences change as a function of the associated focus phrase of the focus-sensitive operator, as indicated by the focus alternatives in brackets.

[19] This correctly predicts that languages which encode finiteness not by affixes do not show movement of lexical verbs. This is the case in the *finiteness second* language Warlpiri as described by (Hale 1983), in which finiteness is obviously morphologically disconnected from the verb. The 2nd position is taken by finiteness morphology whereas the verb can be elsewhere, as shown in (i). Legate (2008) argues that the aspect and agreement markers in Warlpiri are (second position) clitics which attach either to auxiliaries or complementizers.

(i) *Ngajulu-rlu ka-rna-ngku nyuntu nya-nyi*
I-ERG PRS-1SUB-2OBJ you see-NON.PST
'I see you' (Hale 1983: 18)

Tohono O'odham (Papago) is another *finiteness second* language in which the finiteness marking is always realized as an auxiliary in second position and never through inflectional affixes on the lexical verb. Consequently in O'odham, the lexical verb never occupies the second position (Zepeda 1983, Miyashita 2006).

(44) a. dass das Kind *nur* [eine kleine Cóla$_{\text{FOC}}$ getrunken hat].
that the child only a small Coke drunk has
'that the child only drank a small Cóke (and not a beer).'

b. dass das Kind *nur* [eine kleíne$_{\text{FOC}}$ Cola getrunken hat].
that the child only a small Coke drunk has
'that the child only drank a smáll Coke (and not a large one).'

c. dass das Kind *lediglich* [ein kleines Bier bestéllt$_{\text{FOC}}$ hat].
that the child solely a small beer ordered has
'that the child only ordered a small beer (she didn't drink it).'

d. dass das Kind *nicht* [die kleíne$_{\text{FOC}}$ Cola getrunken hat].
that the child not the small Coke drunk has
'That the child didn't drink the smáll Coke (but the large one).'

It is still debated how the mechanics of association with focus work in detail (see e. g. Krifka 2006 and Wagner 2006). It is, however, widely accepted that a basic requirement is that the focus-sensitive operator must have scope over the focus, i. e. the operator must c-command the focus constituent (Rooth 1985: 40, König 1993: 985, Bayer 1996: 15, Büring & Hartmann 2001: 237, Krifka 2007: 27).

If the focused constituent is moved to the prefield, the focus particle can be moved along with it, as shown in (45). In this way the c-command requirement remains satisfied.

(45) a. [*Nur* [der Doktoránd]$_{\text{FOC}}$] hat ~~nur der Doktorand~~ die Arbeit geschrieben ~~hat~~.
only the PhD candidate has the thesis written
'Only the PhD candidate has written the thesis.'

b. [*Nur* [die Arbeít]$_{\text{FOC}}$] hat der Doktorand ~~nur die Arbeit~~ geschrieben ~~hat~~.
only the thesis has the PhD candidate written
'The PhD candidate has written only the thesis.'

c. [*Nur* geschríeben$_{\text{FOC}}$] hat der Doktorand die Arbeit ~~nur geschrieben hat~~.
only written has the PhD candidate the thesis
'The PhD candidate has only written the thesis.'

Because c-command commonly implies precedence, the focus particle usually precedes the focus constituent. Under certain conditions, however, the order of focus particle and focus constituent can be reversed, as shown in (46). Crucially, the inverted order leads to marked constructions that receive an emphatic exclamative flavor or are even judged as unacceptable (e. g. Büring & Hartmann 2001: 240). Jacobs (1983: 95–101) adds two more observations regarding the markedness of postfocal particles: First, the productivity of this pattern is lexically restricted, i. e. it is, for example, acceptable with *nur* 'only' but ungrammatical with *lediglich* 'solely', as shown in (46b) vs. (46c). Second, even for particles that allow the inverted order, it occurs preferably in the prefield. In the middlefield it needs stronger intonational means (accent, pause) to avoid an association with subsequent constituents, as in (46d–46e).

(46) (The superscript $^{\text{M}}$ indicates the marked character of the sentence.)

a. $^{\text{M}}$ [Geschríeben$_{\text{FOC}}$] hat der Doktorand die Arbeit *nur* ~~geschrieben hat~~.
written has the PhD candidate the thesis only

b. M [[Der Doktoránd]$_{\text{FOC}}$ *nur*] hat ~~der Doktorand nur~~ die Arbeit geschrieben ~~hat~~.
the PhD candidate only has the thesis written

c. * [[Der Doktoránd]$_{\text{FOC}}$ *lediglich*] hat ~~der Doktorand nur~~ die Arbeit geschrieben ~~hat~~.
the PhD candidate solely has the thesis written

d. M [Der Doktoránd]$_{\text{FOC}}$ hat [*nur* ~~der Doktorand~~] die Arbeit geschrieben ~~hat~~.
the PhD candidate has only the thesis written

e. M ... dass [[der Doktoránd]$_{\text{FOC}}$ *nur*] die Arbeit geschrieben hat.
that the PhD candidate only the thesis written has

If the inverted order of focus particle and focus constituent is caused by V2-movement, however, no markedness is induced, as illustrated in (47b) (Büring & Hartmann 2001: 241, fn.9). Note also that no lexical restrictions are observable, as it was the case for the marked inverse order above.[20]

(47) a. Wir sahen, dass der Hund sich *nur*/ *lediglich* verteídigte$_{\text{FOC}}$.
we saw that the dog REFL only solely defended
'We saw that the dog did only defend itself (it didn't attack those guys).'

b. Der Hund verteídigte$_{\text{FOC}}$ sich *nur*/ *lediglich* ~~verteidigte~~.
the dog defended REFL only solely
'The dog did only defend itself (it didn't attack those guys).'

This apparent irregularity is readily explained by the V2-Reconstruction Hypothesis. From the perspective of interpretation, only the finiteness features move to second position whereas the focused verb is only interpreted in its clause-final base position, in which it is c-commanded by the focus particle. At LF, the structure in (47b) actually looks like (48).

(48) Der Hund -te sich *nur* verteídig$_{\text{FOC}}$~~te~~
the dog 3SG.PST REFL only defend

In sum, the investigation of association with focus indicates that finite verbs in V2-clauses are interpreted only in their base position: Derived word order, in which the focused constituent is outside of the c-command domain of the focus sensitive operator, leads to a strong markedness. This markedness is absent if a focused verb is moved outside the c-command domain of a focus sensitive operator by V2-movement. Hence, I conclude that V2-moved finite verbs are only interpreted in their clause-final base position. In this position, the verb is within the c-command domain of the focus-sensitive operator.

3.3.2 Verbal negative polarity items: Only licensed in the base position

A similar argument can be constructed for negative polarity items. Polarity items are linguistic elements whose interpretation and grammaticality is dependent on the polarity of

[20] This indicates that *lediglich* 'solely' does not belong to the class of focus-sensitive operators that require a focus exponent in its surface scope, as described for *mehr als* 'more than' in Section 2.1.3.

their minimal syntactic environment, for simplicity, the minimal clause in which they occur. This is illustrated for the negative polarity item (NPI) *jemals* 'ever' in (49a) and the positive polarity item (PPI) *durchaus* 'certainly' in (49b). The NPI is only grammatical with the negative subject *niemand* 'nobody' whereas the pattern is exactly the opposite for the PPI. The translations indicate that the same contrast is also observed for the English equivalents.

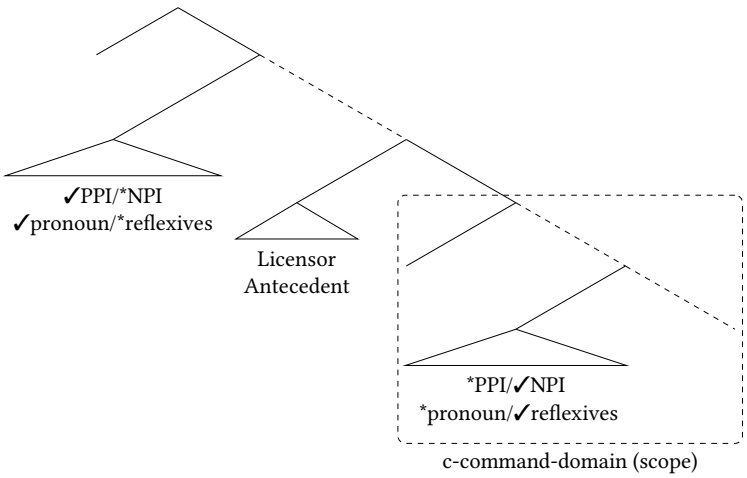
(49) a. Niemand/ *Walter hat die Absicht *jemals*$_{\text{NPI}}$ eine Mauer zu bauen.
nobody Walter has the intention ever a wall to build
'Nobody ever$_{\text{NPI}}$ intended to build a wall.'/'*Walter ever$_{\text{NPI}}$ intended to build a wall.'

b. *Niemand/ Walter hat *durchaus*$_{\text{PPI}}$ die Absicht eine Mauer zu bauen.
nobody Walter has certainly the intention a wall to build
'*Nobody certainly$_{\text{PPI}}$ intended to build a wall.'/'Walter certainly$_{\text{PPI}}$ intended to build a wall.'

Despite the term *negative*, NPIs are not only licensed by anti-additive operators, such as negation, but also by downward-entailing operators such as *few* and *hardly*, in interrogative clauses, in antecedents of conditional clauses, and in complement clauses of adversative predicates such as *doubt* or *refuse* (Progovac 1994, Richter & Radó 2014).[21]

Progovac (1994) proposes to analyze polarity items with the principles of the binding theory. Negative polarity items resemble reflexives such that both are *dependent*: NPIs must be in the scope of an appropriate licensor, as reflexives must be bound by their antecedent. Positive polarity items and pronouns, on the other hand, are *anti-dependent*: PPIs must be interpreted outside of the scope domain of a downward entailing operator (or the particular clause types which have been mentioned above) as pronouns must be interpreted outside of the scope domain of their local antecedents. The configurations of the licensing requirements/restrictions are illustrated in (50).

(50)



[21] NPIs can be divided into strong NPIs, which need to be licensed by anti-additive operators (negation), and weak NPIs, which are also licensed by downward entailing operators. I will not elaborate on this distinction because it bears no relevance for the present argument. For a detailed discussion and experimental confirmation of the licensing requirements of strong and weak NPIs see Richter & Radó (2014).

Adverbial NPIs in German indicate that NPI-licensing has to be satisfied at the surface structure. Adverbial NPIs cannot move out of the c-command domain of their licensor, as illustrated by the contrast between (51) and (52). Even though adverbials can normally be placed freely into the prefield, illustrated by *sicherlich*, *gestern*, and *oftmals* in (51), fronting of adverbial NPIs results in ungrammaticality, as shown in (52).[22]

(51) a. Sicherlich hat niemand$_{\text{LIC}}$ jemals$_{\text{NPI}}$ eine Mauer zu bauen beabsichtigt.
certainly has nobody ever a wall to build planned
'Certainly, nobody ever planned to build a wall.'

b. Gestern haben [nur wenige]$_{\text{LIC}}$ überhaupt$_{\text{NPI}}$ mitgemacht.
yesterday have only few at all participated
'Yesterday, only few have at all participated.'

c. Oftmals hat [kein Student]$_{\text{LIC}}$ [auch nur ein bisschen]$_{\text{NPI}}$ gelernt.
oftentimes has no student also only a bit studied
'Oftentimes, no student has learned only a tiny bit.'

(52) a. *Jemals$_{\text{NPI}}$ hat niemand$_{\text{LIC}}$ ~~jemals~~ eine Mauer zu bauen beabsichtigt.
ever has nobody a wall to build planned

b. *Überhaupt$_{\text{NPI}}$ haben [nur wenige]$_{\text{LIC}}$ ~~überhaupt~~ mitgemacht.
at all have only few studied

c. *[Auch nur ein bisschen]$_{\text{NPI}}$ hat [kein Student]$_{\text{LIC}}$ ~~auch nur ein bisschen~~ gelernt.
also only a bit has no student studied

There are two exceptions to this ban on movement, in which an NPI can be fronted: First, the NPI may be contained in a larger constituent that presumably undergoes reconstruction into its base position and thereby restores the licensing relation, as in (53), see also Meinunger (2004: 54).

(53) a. [Jemals$_{\text{NPI}}$ eine Mauer zu bauen]$_{\text{VP}}$ hat niemand$_{\text{LIC}}$ ~~jemals eine Mauer zu bauen~~
ever a wall to build has nobody
beabsichtigt.
planned
'Nobody ever planned to build a wall.'

b. [Überhaupt$_{\text{NPI}}$ nur eine Prüfung]$_{\text{NP}}$ haben [nur wenige Studenten]$_{\text{LIC}}$ ~~überhaupt nur~~
at all only one exam have only few students
~~ein Prüfung~~ bestanden.
passed
'Only a few students have passed even one exam.'

c. [Auch nur$_{\text{NPI}}$ eine Frage]$_{\text{NP}}$ hat [kein Student]$_{\text{LIC}}$ ~~auch nur eine Frage~~ beantwortet.
also only one question has no student answered
'No student has answered even one question.'

[22] Note that *überhaupt* can be used as a clausal linker in the sense of 'actually/generally'. Under that reading, sentence (52b) is grammatical but *überhaupt* is a different lexical item and not an NPI.

The second option is lexically and morphologically very restricted: Some NPIs can combine with their licensor on the morphological level. Similar to other German indefinites, where we observe that *nicht* 'not' and *ein* 'a' combine to *kein* 'no', or *nicht* and *jemand* 'someone' combine to *niemand* 'no one', I assume that *nicht* and *jemals* 'ever' combine to *niemals*.[23] Example (54) illustrates this *morphological pied-piping* process: In (54a), the subject indefinite combines with the negation and becomes the NPI-licensor. In (54b) the NPI moves to the prefield position, thereby pied-piping the negation.[24] The complex that ends up in the prefield is a self-satisfying construction that combines both, the element to be licensed and the licensor in one word.[25]

(54) ∅ hat NEG_{LIC} jemand jemals$_{\text{NPI}}$ eine Mauer zu bauen beabsichtigt.
has NEG somebody ever a wall to build planned

a. Anscheinend hat niemand$_{\text{LIC}}$ jemals$_{\text{NPI}}$ eine Mauer zu bauen beabsichtigt.
apparently has nobody ever a wall to build planned
'Apparently, nobody ever planned to build a wall.'

b. Niemals$_{\text{LIC+NPI}}$ hat ~~NEG_{LIC}~~ jemand ~~jemals$_{\text{NPI}}$~~ eine Mauer zu bauen beabsichtigt.
Never has somebody a wall to build planned
'Never did anyone plan to build a wall.'

With this background on NPIs, we now inspect the exceptional German verb *brauchen* 'need'. Despite its transitive use, *brauchen* also functions as a modal verb on a par with *müssen* 'must', where it has the meaning 'need to/be obliged to'.[26] As a modal verb, *brauchen*

[23] Penka (2011) provides arguments for the separation of the negation and the indefinite meaning, even though her view on the lexical and syntactic analysis of these elements differs from the present one.

[24] It is always the highest (leftmost) indefinite that combines with the negation. The negation probably marks the right edge of the existential closure domain because, if an indefinite precedes the negation, it receives an existential interpretation, as in (i), see Diesing (1992) for more on this.

(i) a. *Wahrscheinlich hat niemand die Blumen gegossen.*
probably has no one the flowers watered
'It's possible that no one watered the flowers.'

b. *Wahrscheinlich hat jemand die Blumen nicht gegossen.*
probably has someone the flowers not watered
'It's possible that a specific person whose name I will not say, has not watered the flowers.'

[25] Note that these cases resemble the examples in (45) where the focus sensitive operators move with the focus constituent to the prefield.

[26] Barbara Tomaszewicz (p. c.) pointed out that the English modal *need* (without *to*) is also an NPI that necessarily scopes under negation to be proper licensed, such that the sentence in (i), only allow the reading in (i.a) but the surface scope order as in (i.b) is not available.

(i) *You need*(n't) shout*
a. *You don't need to shout.* (NEG > MODAL)
b. # *You need to not shout.* (MODAL > NEG)

is an NPI, as shown in (55).[27]

(55) Er weiß, dass er dem Studenten *(nicht$_{LIC}$) zu drohen braucht$_{NPI}$.
he knows that he [the student].DAT not to threaten needs
'He knows that he doesn't need to threaten the student.'

In V2-clauses, such as (56), *brauchen* appears in second position, where it precedes the negation. In this constellation, the NPI *brauchen* is outside of the c-command domain of its licensor *nicht*. It is obvious that *brauchen*, in (56), does not employ one of the above mentioned exceptions: It has not been moved to C as part of a larger constituent and it does not morphologically combine with its licensor. The NPI *brauchen*, therefore, seems to be the only NPI that can violate its licensing condition.

(56) Er braucht$_{NPI}$ dem Studenten *(nicht$_{LIC}$) zu drohen ~~braucht~~.
he needs [the student].DAT not to threaten
'He doesn't need to threaten the student.'

The V2-Reconstruction Hypothesis provides a solution to this paradoxical situation. At surface structure (PF), the finite verb moves to second position (C), only to deliver the finiteness feature. The semantic interpretation of the verb, however, takes place in its base position, where it is c-commanded by the NPI-licensor. The finite verb undergoes reconstruction in the same way as the phrasal elements in (53). Hence, no exception to the licensing mechanism of NPIs has to be assumed. The conclusion is that what we see is not what we get at the LF-side of the grammar: At LF, the structure of (56) actually turns out to be as in (57).

(57) Er -t dem Studenten nicht$_{LIC}$ zu drohen brauch$_{NPI}$~~t~~.
he 3SG.PRS [the student].DAT not to threaten need
'He doesn't need to threaten the student.'

This argument is not restricted to a single lexical item. German exhibits several verbal NPIs. A natural example is given in (58a) and there are three more constructed examples in (59). The (un)grammatical alternatives in each case illustrate that the verbs, or rather verb frames, are NPIs.

(58) Raketentests sind Nordkorea per UN-Resolution verboten.
'For North Korea it is forbidden to conduct missile tests by UN-resolution.'
a. Aber das schert$_{NPI}$ Machthaber Kim Jong-un wenig$_{LIC}$/ nicht$_{LIC}$/ *ein bisschen/ *∅
but this bothers potentat Kim Jong-un little not a bit
~~schert~~.

'But this bothers potentate Kim Jong-un little/not/a bit/∅.' [ZDF (TV), Morgenmagazin, 29.08.2017]

[27] Dutch exhibits an equivalent NPI modal verb *hoeven* 'need' (see Lin et al. 2015 and references therein). Because of the extensive similarities between Dutch an German, in particular being V2 and OV-languages, the argument for *brauchen* is valid for *hoeven* as well.

(59) a. Zumindest verhehlt$_{\text{NPI}}$ Julius die Verachtung für seinen Vater nicht$_{\text{LIC}}$/ *schon/ *∅
at least concealed Julius the contempt for his father not indeed
~~verhelt~~.

'At least Julius did(n't) (indeed) conceal the contempt for his father.'

b. Ich verdenke$_{\text{NPI}}$ es niemandem$_{\text{LIC}}$/ *jedem, der so etwas erlebt
I blame EXPL nobody everybody who so something experienced
hat, ~~verdenke~~ (dass er enttäuscht ist).
has that he dissapointed is
'I blame nobody/erverbody who has experienced such things (for being disappointed).'

c. Das vergesse$_{\text{NPI}}$ ich dir nie$_{\text{LIC}}$/ nicht$_{\text{LIC}}$/ *morgen/ *sicherlich ~~vergesse~~.
that forget I you never not tomorrow certainly
'I will (∅/forever/certainly) keep that in mind (until tomorrow).'

Most verbal NPIs in German, however, occur in one of two forms that exclude or mask the reconstruction effect: Verbal NPIs of the first type are accompanied by (finite) auxiliaries/modal verbs (mostly idiomatically), which has the effect that the non-finite verbal NPI remains in its base position in V2-clauses, as in (60a). The second type comprises particle verbs where only the inflected stem moves to the V2-position while the particle remains in the clause-final base position, as in (60b). For particle verb NPIs, the argument from Section 3.2.1 becomes relevant: The moved part of the verb must be reconstructed into the base position, next to the particle, in order to allow the interpretation of the complex verb and to evaluate the NPI-specific meaning.[28]

(60) a. Trotzdem konnte ich diese Person niemals$_{\text{LIC}}$/ *immer schon [ausstehen ~~konnte~~]$_{\text{NPI}}$.
although could I this person never always stand
'Although I could never/*always stand this person.'

b. So komme ich nicht$_{\text{LIC}}$/ *sehr wohl [umhin~~komme~~]$_{\text{NPI}}$, meine Drohung wahr zu machen.
so come I not very well PRT my threats true to make
'So I'm bound to deliver on my threat.'

Summing up, the argument of this section extends the claim of the previous section that verbs must be interpreted in their base position in order to be within the domain of scope taking operators such as negation. Building on the well-known principles of NPI-licensing, I have shown that the German verbal NPIs, such as *brauchen*, apparently violate this licensing conditions when they have undergone V2-movement. Under the V2-Reconstruction Hypothesis, however, the situation is readily solved because the finite verbal NPI is interpreted in

[28] Many thanks to all researchers that contributed to *the Collection of Distributionally Idiosyncratic Items* (CoDII). The website hosts a rich data base of German polarity item which makes reasearch on these guys a lot easier. It is available at https://www.english-linguistics.de/codii/index.html, where more information about contributors, research institutes, and funding are available. For references and several other German NPIs that are not yet included in the CODII data base see Richter et al. (2010).

its base position, where it is properly licensed. In Chapter 6, I present two experiments investigating the verbal NPI *brauchen*, which further corroborate the argument of this section.

3.3.3 Sentential negation: C-commanding the verbal base-position

Negation allows us to construct an even more general argument for obligatory reconstruction: As I will show, only obligatory reconstruction of the finite verb explains how sentential negation in V2-clauses with a single verbal element can be derived.

Negation may vary in its scope domain, as roughly indicated by the brackets in (61). Only the negation in (61a) can receive wide scope as sentential negation with the effect of reversing the truth value of the respective affirmative sentence. The negation in (61b) takes only narrow scope (constituent negation) and excludes the respective constituent from the otherwise positive statement.[29]

(61) a. [Letztlich hat Christopher seinen Bruder *nicht* besucht].
finally has Christopher his brother not visited
'Eventually, Christopher didn't visit his brother. (But he will go for breakfast with his aunt today.)'

b. Letztlich hat Christopher [*nicht* seinen Bruder] besucht.
finally has Christopher not his brother visited
'Eventually, Christopher visited not his brother (but his girl friend).'

From a semantic perspective, it is somewhat surprising that sentence negation is not realized by an initial negation that takes surface scope over the entire clause structure, as noted by Zeijlstra (2007). In the German examples in (61) it even seems that the sentential negation occurs very low in the structure. How can this be explained? The expression of negation in natural languages shows considerable typological variation (Zanuttini 2001, Miestamo 2007) but one generalization seems to hold: sentential negation must c-command the highest verbal element of the clause.[30] Haider (2012: 138–139) states that negation (and high adverbials) must c-command the element that situates the event variable in order to receive wide scope. This element is the finite verb in finite clauses and the highest non-finite verb in non-finite clauses. Accordingly, the negation in (61a) must have scope over the finite auxiliary *hat* or the whole verbal complex *besucht hat* respectively. Example (62) demonstrates that the base position of the negation is within the VP, in a preverbal position. Note that the order of arguments and negation reflects the base generated order because *wh*-indefinites do not scramble.

(62) Da hat [$_{VP}$ wer wen nicht besucht ~~hat~~].
there has someone.NOM somebody.ACC not visited
'Someone didn't visit somebody.' (see Haider 2012: 138)

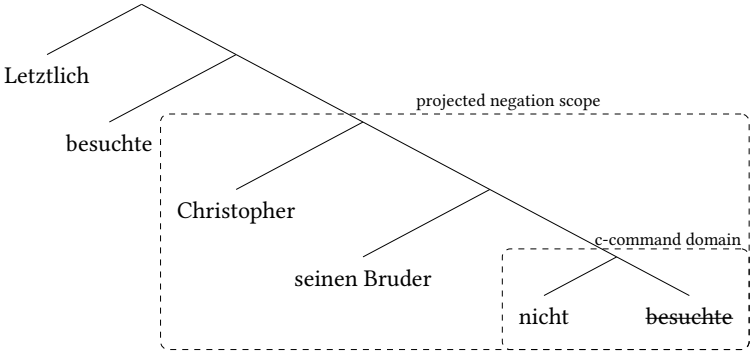
[29] Constituent negation may be ultimately subsumed as an association with focus phenomenon (see Section 3.3.1). I will not go into detail here.

[30] In verb-initial languages, the negation therefore occurs in pre-VP positions, whereas in verb-final languages negation either occurs as a preverbal particle (German) or as postverbal particle or an affix (Korean, Turkish) (Zanuttini 2001, Miestamo 2007).

The negation scope becomes even more evident in (63a). Here the sentence contains only one verbal element. This verb must be finite and therefore moves to the V2-position. Hence it left the c-command domain of the negation. The structure in (63a), however, is still interpreted as sentence negation. Under the assumption that the finite verb is reconstructed and interpreted in its base position, this fact is readily explained. In its base position, the verb *besuchte* in (63a) is within the scope of the negation. Note that this mechanism was crucial to explain the licensing of the NPI-verb *brauchen* in the previous section. In a simplified matter, we might say that the negation must precede the head of the phrase over which it scopes.[31]

(63) a. Letztlich besuchte Christopher seinen Bruder nicht ~~besuchte~~.
finally visited Christopher his brother not
'Finally Christopher didn't visited his brother.'

b.



Note further that covertly raising sentential negation to a higher position in which it scopes over the V2-verb, as in (63a), is not a valid option. Such raising would predict that, under sentential negation, all NPIs that occur in a position lower than the V2-position should be licensed, contrary to the fact. (64a) shows that the NPI *jemals* 'ever' is ungrammatical in a position lower than the V2-position but higher than the sentential negation. In contrast, (64b) shows that *jemals* can be licensed in this very position by a licensor that scopes over the V2-position, here, the negative phrase *auf keinen Fall* 'in no way' in Spec-CP.[32]

(64) a. Letztlich besuchte Christopher (*jemals$_{\text{NPI}}$) seinen Bruder nicht$_{\text{LIC}}$ ~~besuchte~~.
finally visited Christopher ever his brother not

b. [Auf keinen Fall]$_{\text{LIC}}$ besuchte Christopher jemals$_{\text{NPI}}$ seinen Bruder ~~besuchte~~.
at no case visited Christopher ever his brother
'In no way did Christopher ever visit his brother.'

[31] Clearly this simplification ignores independent morphosyntactic restriction on the occurrence of negative markers (particles, affixes or auxiliaries, etc.). The shell structure of head-initial projection may induce additional problems. The reader is referred to Haider (2012) for a detailed discussion of these sort of configurational aspects.

[32] Under such a raising account, the surface position of negative operators becomes irrelevant for the identification of their scope domain. Hence, we loose the ability to explain the differences in negation placement in OV- vs. VO-languages. This difference, however, appears to be very robust, even in the Scandinavian languages, which combine both properties, being V2-languages and VO-languages. Hence, we must reject accounts that rest on LF-raising of the sentential negation.

Since the negation does not raise, the only explanation for sentential negation in sentences like (63a) is that the lexical verb reconstructs into its base position where it is within the scope of the negator, as illustrated in (65).

(65) Letztlich -te Christopher seinen Bruder nicht besuch-~~te~~.
finally 3SG Christopher his brother not visit
'Finally, Christopher didn't visit his brother.'

The generalization about negation in German also correctly captures the observation that, in constituent negation, the negation directly precedes the negated constituent: This is illustrated for head-initial phrases, such as the PP (the locative adverbial) in (66a), and the DP (the object) in (66b), as well as for bare heads, such as the pronoun in (66c), and the adjective inside the object-DP in (66d).[33] Additionally, the generalization correctly predicts that preverbal negation in German is superficially ambiguous between sentential negation in (66e) and verb negation in (66f), even though both cases may be distinguished by phonological means.

(66) a. Gestern hat er den jungen Professor [nicht [in der Universität]] gefunden ~~hat~~.
yesterday has he the young professor not in the university found
'Yesterday he did'nt find the young professor in the university.'
b. Gestern hat er [nicht [den jungen Professor]] in der Universität gefunden ~~hat~~.
c. Gestern hat [nicht er] den jungen Professor in der Universität gefunden ~~hat~~.
d. Gestern hat er [den [nicht jungen] Professor] in der Universität gefunden ~~hat~~.
e. Gestern hat er den jungen Professor in der Universität [nicht [gefunden ~~hat~~]].
f. Gestern hat er den jungen Professor in der Universität [nicht gefunden] ~~hat~~.

This *projection of negation scope* can be illustrated even more explicitly by *clause union effects* with German verb clusters (Haider 2010: 19, 272–292), an observation that dates back to Bech (1955). Consider the ambiguous sentence in (67), for example. The preverbal negation can either be interpreted as applying only to the adjacent infinitive, as in (67a), or as scoping over the whole verb cluster, thereby receiving wide scope, as in (67b). If the non-finite complement is extraposed, the scope of the negation is unambiguous: Preceding the infinitive, it only scopes over the embedded clause, as in (67c), whereas it has matrix scope when it precedes the matrix verb, as in (67d).

[33] Peter Culicover (p. c.) and Josef Bayer (p. c.) noted that the situation is a little more complex, because there are examples in which the negator is embedded within PPs or complex DPs, as in (i), and still scopes out of these complexes to licence NPIs in the c-command domain of the head node of these complexes (see also Bruening 2014):

(i) a. *[[Not many professors']$_{LIC}$ students] expect anything$_{NPI}$ when the professors retire.*
b. *I talked [to [no one]$_{LIC}$] about any$_{NPI}$ of the problems.*

Josef Bayer pointed out that the problem disappears if the feature of the negator is properly activated via agreement, as proposed in Bayer & Bader (2007).

(67) Der Vater hat ihn nicht zu stören versucht.
the father has him not to disturb tried

a. Der Vater hat ihn [*nicht* zu stören] versucht.
the father has him not to disturb tried
'The father tried not to disturb him.'

b. Der Vater hat ihn [*nicht* [zu stören versucht]].
the father has him not to disturb tried
'The father did not try to disturb him.'

c. Der Vater hat t_1 versucht, [ihn [*nicht* zu stören]]$_1$.
the father has tried him not to disturb
'The father tried not to disturb him.'

d. Der Vater hat t_1 [*nicht* versucht], [ihn zu stören]$_1$.
the father has not tried him to disturb
'The father did not try to disturb him.'

Further support for the reconstruction of the finite verb comes from VP-topicalization patterns. Huang (1993: 132–135) noted that topicalized VPs in German reconstruct (see also Bayer 1993: 7–8, fn. 10), as evidenced by binding facts in (68).[34] The reciprocal pronoun *einander* 'each other' in (68a) must be c-commanded by the antecedent *die Raufbolde* 'the roughecks' in order to be properly bound. The personal pronoun *ihm* 'him' in (68b), in contrast, must be c-commanded by the antecedent *Christopher* in order to exclude co-reference, as indicated. In both cases, the topicalized VP must reconstruct into its base position.

(68) a. [Einander$_{i/*j}$ verziehen] haben die Raufbolde$_i$ dann doch noch ~~einander$_{i/*j}$ verziehen~~
each other forgive have the roughnecks then PRT PRT
~~haben~~

'Eventually the roughnecks did forgive each other.'

b. [Ihm$_{*i/j}$ verziehen] hat Christopher$_i$ dann doch noch ~~ihm$_{*i/j}$~~ ~~verziehen~~ ~~hat~~
him forgiven has Christopher then PRT PRT
'Eventually Christopher did forgive him.'

Verb topicalization, as in (69a), may only front the non-finite verb and leaves the sentential negation behind. This structure still has both readings, with either constituent negation of the lexical verb, comparable to (66f), or sentential negation, comparable to (66e). If the negation, however, is fronted with the non-finite verb, as in (69b), it can only have narrow scope over the verb, as constituent negation. Interestingly, (69c) shows that, if a larger VP is topicalized, the sentential negation remains in its base position. In this way, it is ensured that the negation c-commands the whole verb complex, in which both the finite and non-finite verb are reconstructed, and thereby enabling sentential negation.[35] In sum, these patterns

[34] Pronouns in German tend to appear early in the middle field, i. e. preceding the adverbials and particles in (68). I will ignore this for the moment.

[35] Note that this is different for at least *wh*-indefinites. There, the indefinite must be reconstructed below the negation. The interpretation of (i) means that there was no one that the boy has visited, not that there was

show that under sentential negation elements of the verbal complex may be moved out of the c-command domain of the negation because they are reconstructed into these base positions (Haider 2012: 138–139).

(69) a. Besucht hat [$_{VP}$ der Junge den Vater *nicht* ~~besucht~~ ~~hat~~].
visited has the boy the father not
'As for visiting, the boy didn't visit the father.' WIDE SCOPE/
'The boy didn't VIsited the father.' NARROW SCOPE

b. [*Nicht* besucht] hat [$_{VP}$ der Junge den Vater ~~[*nicht* besucht]~~ ~~hat~~], sondern angerufen.
not visited has the boy the father but called
'Not visited, that was what the boy did with the father, but called.'

c. [Den Vater besucht] hat [$_{VP}$ der Junge ~~den Vater~~ (jedenfalls) [*nicht* ~~besucht~~ ~~hat~~]].
the father visited has the boy PRT not
'The boy did not visit the father.'

Haider (2012) argues that a very similar argument can be made for *high* sentence adverbials, such as *leider* 'unfortunately'. He claims that adverbials must c-command their modification domain or at least the head of the respective projection. This leads to the same typological difference as with negation: In OV-languages, like German, *high* sentence adverbials can appear VP internal but in VO-languages, such as English, sentence adverbial must precede the VP. A detailed discussion of the placement of adverbials would go beyond the scope of this section. I therefore refer the reader to Haider (2012: 139).

Summing up: The argument of this section is based on the assumption that semantic operators, such as negation, must c-command the head of their scope domain. For sentential negation this domain consist of the whole VP in VO-languages but only the verbal complex in OV-languages. In V2-clauses (of OV- and VO-languages alike) the finite verb, however, is moved out of the scope domain of the sentential negation. The V2-Reconstruction Hypothesis offers an explanation why this does not affect scope relations: The finite verb is reconstructed into its base position for interpretation. In its base position, the finite verb is within the c-command domain of the sentential negation. Scope taking therefore applies in the same way as in verb-final subordinate clauses. The V2-Reconstruction Hypothesis therefore offers a principled account of the computation of the scope domain of sentential negation in V2-clauses.

3.3.4 Summary: Lexical interpretation only in the base position

In this section, I have presented three phenomena in favor of an obligatory reconstruction of the finite verb in V2-contexts. The two phenomena verbal NPIs and sentential negation

one specific person that he did not visit, see also Footnote 24 in Section 3.3.2.

(i) *Wen besucht hat [$_{VP}$ der Junge (jedenfalls) nicht* ~~*wen besucht hat*~~*].*
someone visited has the boy PRT not
'Finally, the boy didn't visit anyone.'

showed that the finite verb has to be interpreted in the clause-final position to license the NPI and to enable wide scope of the negation, respectively. The discussion of focus-sensitive operators associated with focused finite verbs went even further and suggested that the finite verb is interpreted only in its base position, which is indicated by the absence of an emphatic markedness which is observed in all other configurations of an inverted order of focus-sensitive operator and focus constituent.

3.4 Experiment 1: The lexical meaning of periphrastic *tun* (acceptability judgments)

3.4.1 Rationale

Introductory information about the *tun*-periphrasis in German is given in Section 3.2.2. There, I noted that a number of authors have stated that certain verbs are incompatible with periphrastic *tun* for semantic reasons, even though the characterization of the verb classes vary: agentive vs. non-agentive verbs (Fischer 2001: 40), eventive vs. stative verbs (Hoekstra 2016: 342), telic vs. atelic verbs (Schönenberger & Penner 1995: 318–319), and individual-level vs. stage-level predicates (Bayer & Freitag To appear). Clearly, all these characterizations build on the intuition that *tun* 'do' specifies an activity. However, as Bayer & Freitag (To appear: 5) note, also stative verbs seem quite acceptable with periphrastic *tun*, as long as they can be interpreted as stage-level predicates, i. e. denoting a temporary property/state, as in (70).

(70) Die Clarissa tut den ganzen Tag auf dem Sofa liegen.
the Clarissa does the whole day on the sofa lie
'Clarissa is lying on the sofa the whole day.' (Bayer & Freitag To appear: 5)

Rothmayr (2009) provides a detailed investigation of stative verbs, building on earlier work by Maienborn (2003, 2005, 2007). She distinguishes two different kinds of stative verbs: D(avidsonian) statives and K(imian) statives.[36] The two classes differ with respect to the ontological type of argument they take. D-states, such as *sleep*, contain an event argument, whereas K-states, such as *weigh*, exemplify a property P at a particular time. Some typical representatives are given in (71).[37]

(71) a. **Davidsonian statives**:
sitzen 'sit', *stehen* 'stand', *liegen* 'lie', *schlafen* 'sleep', *warten* 'wait', *leuchten* 'gleam'
b. **Kimian statives**:
intelligent sein 'be intelligent', *müde sein* 'be tired', *wiegen* 'weigh', *kennen* 'know', *wissen* 'know', *ähneln* 'resemble'
(see Rothmayr 2009: 7)

[36] The terminology refers to work by Davidson (1967) and Kim (1976).
[37] Clearly, some verbs can have more than one meaning, thereby occurring in more than one class, such as *Clarissa lies on the couch* as D-state (an event), and *Constance lies on a lake* as a K-state (a property), see Rothmayr (2009: 37–107) for more on these stative/eventive ambiguities.

Rothmayr (2009: 28–36) presents several diagnostics to distinguish D-states from K-states. Most relevant in the current context is the compatibility with periphrastic *tun*, which she judges perfectly fine with activity verbs as in (72a), clearly unacceptable with K-states as in (72b), and marginal with D-states as in (72c).[38]

(72) a. Josef tut gerade diese Doktorarbeit lesen.
Josef does right now this dissertation read
'Josef is reading this dissertation right now.'

b. * Josef tut diese Oper gut kennen.
Josef does this opera well know

c. ?/?? Josef tut verlegen in der Ecke stehen.
Josef does bashfully in the corner stand

(see Rothmayr 2009: 30–31)

A further diagnostic is that event nominalizations in German can be formed with the suffix *-erei* or the circumfix *Ge-…-e*, which is possible with activity verbs as in (73a) and D-states as in (73c). With K-states, on the other hand, such nominalizations are out, as shown in (73b), because they do not contain an event argument.

(73) a. lesen – Les-erei – Ge-les-e
read reading reading

b. kennen – Kenn-erei – *Ge-kenn-e – z. B. *das Opern-Gekenne
know knowing knowing e. g. the opera-knowing

c. stehen – Steherei – Ge-steh-e
stand standing standing

Additionally, Rothmayr (2009) exemplifies three diagnostics that are based on adverbial modification with manner adverbials, locative modifiers, and degree readings of *ein bisschen* 'a little bit'. The rationale is the same for these three diagnostics: The modification targets an event. Hence, they are incompatible with K-states. I will only illustrate this for manner adverbials with the unavailability of manner modification for K-states in (74b), in contrast to activity verbs and D-states in (74a) and (74c), respectively.

(74) a. Josef liest diese Doktorarbeit aufmerksam/ gründlich.
Josef reads this dissertation attentively thoroughly
'Josef reads this dissertation attentively/thoroughly.'

b. Josef kennt diese Oper *aufmerksam/ *gründlich.
Josef knows this opera attentively thoroughly
'Josef knows this opera *attentively/thoroughly'[39]

[38] Rothmayr (2009: 31) marked the example with a D-stative, corresponding to (72c), only with an asterisk, although she describes it as *marginal* in the text. Maienborn (2003: 63, ex. 41) marks these sentences with a ?. I therefore changed the judgement marking accordingly.

[39] *Thoroughly* seems to be unmarked in this context. I suspect that this is because it can have a meaning in which it describes the property of the state of knowledge in the sense of 'know st. very good'. It therefore does not count as a manner modification in the intended sense, in contrast to German *gründlich* or *reading thoroughly*. Thanks to Katie Fraser (p.c.) for sorting this out.

c. Josef steht bewegungslos/ aufrecht in der Ecke.
Josef stands motionless upright in the corner
'Josef stands motionless/upright in the corner'
(see Rothmayr 2009: 30–31)

In contrast to the distinction of stage-level/individual-level predicates, the division of statives into D-states and K-states refers to the internal structure of the predicates and not to their discourse status. The crucial observation for this claim is that in copular constructions both stage-level and individual-level predicates express a K-state (see Rothmayr 2009: 3–28 for a comprehensive overview of the accounts of event semantics). As for the purpose of this chapter, this classification provides the basis for the following experiment, in which I will test the predictions regarding the varying compatibility of K-states and D-states with periphrastic *tun*, illustrated in (72). Additionally, I will test the prediction from Section 3.2.2 , i. e. that such incompatibilities are absent in VP-topicalizations, where *tun* is directly inserted in C to satisfy the V2-requirement.[40]

3.4.2 Method

Participants

In this experiment, 49 participants (19–37 years, mean 23 years; 8 male; 4 left handed) were tested, all self-declared native speakers of German (5 bilinguals) and students of the University of Cologne. Participants either received course credits or 4 € for participation.

Materials

Materials consisted of 36 experimental items interspersed with 44 fillers (28 from a different experiment) resulting in a total of 80 stimuli per participant. Every stimulus was introduced by a short context (1–3 sentences). The experimental items varied in two factors, Verb Type and Clause Type. The Verb Type was fixed for the lexical variants. Clause Type varied within the lexical variants, as illustrated by the sample items in (75)–(77). For each Verb Type, at least three structural variants, as exemplified in Table 3.2, were tested to obtain a representative sample of the verb class. In the VP-topicalization condition, for most items, the whole VP, including complements, is fronted whereas in others only the infinitival verb appeared in initial position. All items are given in the appendix.

(75) activity
a. Context:
Derzeit geht es ihr zu langsam voran. Also wirft die Chefin der Autowerkstatt einen Blick durch die Scheibe in den Werkstattraum.
'At the moment, she considers the progress to be too slow. So the boss of the garage takes a look through the window into the workroom.'

[40] The observation that the aspectual incompatibility vanishes in VP-topicalization is also noted by Maienborn (2003: 62, fn. 12), however, without offering any explanation for it.

b. LEXICAL V2
Der Lehrling repariert immer noch den alten Golf.
the apprentice repairs still the old Golf
'The apprentice is still repairing the old VW Golf.'

c. TUN-PERIPHRASIS
Der Lehrling tut immer noch den alten Golf reparieren.
the apprentice does still the old Golf repair
'The apprentice is still repairing the old VW Golf.'

d. VP-TOPICALIZATION
Den alten Golf reparieren tut der Lehrling immer noch.
the old golf repair does the apprentice still
'What the apprentice is still repairing is the old VW Golf.'

(76) K-STATES

a. Context:
Taucher haben das Wrack eines uralten Schiffes gefunden. Es scheint beinahe senkrecht nach unten gesunken zu sein.
'Scuba divers have found the wreck of a very old ship. It seems to have sunk almost upright.'

b. LEXICAL V2
Die Bugspitze steckt jedenfalls metertief in dem schlammigen Meeresboden.
the nose sticks in any case meters deep in the muddy sea ground
'The nose sticks in any case several meters deep in the muddy sea ground.'

c. TUN-PERIPHRASIS
Die Bugspitze tut jedenfalls metertief in dem schlammigen Meeresboden
the nose does in any case meters deep in the muddy sea ground
stecken.
stick
'The nose sticks in any case several meters deep in the muddy sea ground.'

d. VP-TOPICALIZATION
Metertief in dem schlammigen Meeresboden stecken tut die Bugspitze jedenfalls.
meters deep in the muddy sea ground stick does the nose in any case
'What the nose does is stick meters deep in the muddy sea ground.'

(77) D-STATES

a. Context:
Eine Patientin wird mit hohem Fieber ins Krankenhaus eingeliefert. Allerdings sieht man ihr die Temperatur kaum an.
'A patient is brought to the hospital suffering from intensive fever. However, the high temperature is hardly noticeable when looking at her.'

b. LEXICAL V2
Die Patientin schwitzt lediglich an den Beinen.
the patient sweats solely at the legs
'The patient sweats only from her legs.'

c. TUN-PERIPHRASIS
Die Patientin tut lediglich an den Beinen schwitzen.
the patient does solely at the legs sweat
'The patient sweats only from her legs.'

d. VP-TOPICALIZATION
Schwitzen tut die Patientin lediglich an den Beinen.
sweat does the patient solely at the legs
'The patient sweats only from her legs.'

subtypes	n	example
		ACTIVITY
inanimate object	(4/12)	*das Auto reparieren* 'repair the car'
animate object	(4/12)	*den Sohn umarmen* 'hug the son'
PP-complement	(4/12)	*über die Bahn schimpfen* 'grumble about the railroad'
		K-STATES
position	(4/12)	*im Boden stecken* 'stick in the ground'
ES possesor	(4/12)	*dem Vater ähneln* 'resemble the father'
measure	(4/12)	*2 € kosten* 'cost 2 €'
		D-STATES
position	(4/12)	*im Weg stehen* 'stand in the way'
internal cause	(4/12)	*grün leuchten* 'glow green'
PP-complement	(1/12)	*auf den Anruf warten* 'wait for the call'
other	(3/12)	*an den Beinen schwitzen* 'sweat on the legs'

Table 3.2: Structural variant of the verb types used in experiment 1

Procedure

The experiment was conducted as a rating task with a reference sentence (anchor) and an open scale, similar to thermometer judgments (Featherston 2008, 2009). The current task design was as follows: Participants were provided with a single reference sentence (78), a declarative with a center-embedded object clause, which is possible but dispreferred to the variant with the embedded clause right-extraposed. This reference sentence was associated with a score of 0. Participants were asked to judge the acceptability of the target sentences in comparison to the reference sentence. Instruction asked if sentences are better or worse,

easier or harder to understand. It was stated explicitly that it is not asked for prescriptive rules or "good" writing style. The instructions also provided some examples with respective proposals for scores.

(78) Die Angestellten haben, dass der Chef Probleme hat, nicht sofort bemerkt.
the employees have that the boss problems has not immediately noticed
'The employees did not immediately notice that the boss has problems.'

If a target sentence was worse than the reference sentence, participants should associate a negative score. If it was better, they should assign a positive score. The number range was open but only integers allowed.

The procedure was programmed in the python experiment suite PsychoPy (Peirce 2007) and run on a PC in a psycholinguistic lab. Participants saw four practice items to get acquainted with the task. The experimental stimuli were randomized according to a partial Latin square design,[41] so each participant saw each of the 24 items in exactly one of the five experimental conditions. The total list of stimuli was randomized by the experiment software. The experiment took approximately 20 minutes.

Predictions

According to the claims in the literature and the argumentation above, I expect an interaction of Verb Type and Clause Type that looks as follows: No verb-specific effect should appear in the lexical V2 condition because V2-movement is insensitive to the lexical meaning of the verb. In the tun-periphrasis condition, I expect an effect of verb type with clearly higher acceptability ratings for activity in comparison to the other two verbs. Additionally, D-states should be a little more acceptable than K-states. Furthermore, no verb-specific effect is predicted in the VP-topicalization condition because the *tun* is semantically empty. However, the ratings for VP-topicalization should be higher than for the tun-periphrasis because VP-topicalization does not contain a semantic incompatibility. This prediction is restricted to the K-states and D-states verb, that are marked in the tun-periphrasis construction. Obviously, the lexical V2 condition is expected to receive higher ratings because it is an unmarked construction with respect to pragmatics and information structure, whereas the tun-periphrasis and the VP-topicalization are marked in this respect.

Data analysis

Prior to statistical analysis, all emtpy cells have been removed (n=21, 0.5 % of the data). Additionally, I excluded 4 extreme values after data inspection. These values are all singular outliers, which are more than 4 standard deviations away from the participants' mean and therefore most likely constitute typos. I analyzed the data using the statistical software package R (R Core Team 2015), applying linear mixed-effects models of the *lme4* package (Bates et al. 2013) to analyze the Z-transformed response scores. Following arguments in Barr et al. (2013) and Bates et al. (2015), I fitted maximal justified random effect structures for the

[41] The Latin square was restricted because Verb Type was fixed per item, as noted above.

LME-models. I performed a model criticism as recommended in Baayen & Milin (2010) by excluding absolute standardized residuals exceeding 2.5 standard deviations. I report the results of the criticized model, taking effects as significant if the respective t-value exceeds an absolute value of 2.

In response to the predictions above, I will employ separate analysis of subsets of the data. In a first analysis, I will compare the syntactic configurations (Clause Type). The second analysis will investigate the effect of Verb Type within each of the three configurations. The third analysis will test for each verb type, whether the syntactic configuration correlates with the acceptability.

3.4.3 Results

A graphical summary of the results is presented in Figure 3.1 The primary analysis revealed a main effect of Clause Type with much higher values for lexical V2 structures than for tun-periphrasis and VP-topicalization ($t = 29.91$), see Table 3.3. No difference between the two latter condition could be detected. The secondary analyses detected Verb Type-specific effects only within the tun-periphrasis condition, but no differences in the lexical V2 or the VP-topicalization group. Within the tun-periphrasis group, the activity verbs received significantly higher ratings in comparison to the K-states verbs ($t = -2.126$). Mean rating for the D-states ranges between the two other conditions and is not significantly different from either of them, at least after model criticism ($t = -1.237$), which indicates that the significance in the raw model is driven by outliers, see Table 3.4. The tertiary analysis of the D-states and the K-states condition confirmed the above results. Within both groups, only the extreme difference of the lexical V2 condition in comparison to the other two constructions yields significance. All other contrasts remain non-significant.

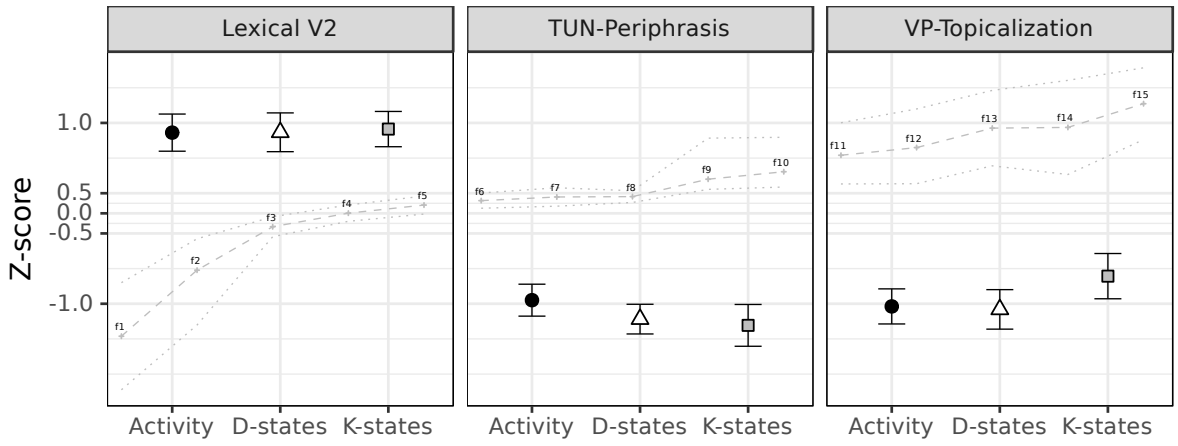


Figure 3.1: Mean Z-scores of the acceptability ratings of experiment 1. The background shows the acceptability of the independent fillers (all errorbars show 95 % CIs). Note the compressed scale in the middle of the Y-axis.

Table 3.3: Output of the LME model for the CLAUSE TYPE-analysis in experiment 1
`lmer(Z.score~clause.type+(1+clause.type|participant.ID)+ (1+clause.type|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (TUN-PERIPHRASIS)	−1.06	0.05	−22.07	−1.05	0.05	−19.07
LEXICAL V2	2.04	0.07	29.91	2.01	0.07	26.92
VP-TOPICALIZATION	0.07	0.07	0.98	0.07	0.07	0.98

Table 3.4: Output of the LME model for the TUN-PERIPHRASIS-analysis in experiment 1
`lmer(Z.score~verb.type+trial+(1+verb.type+trial|participant.ID)+ (1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (ACTIVITY)	−1.024	0.049	−20.727	−0.971	0.059	−16.500
D-STATES	−0.038	0.031	−1.237	−0.100	0.043	−2.322
K-STATES	−0.086	0.040	−2.126	−0.114	0.052	−2.191
trial	−0.001	0.001	−1.224	−0.001	0.001	−0.842

3.4.4 Discussion

The results match most of the predictions. Foremost, the expected interaction of Clause Type and Verb Type could be detected. tun-periphrasis received higher ratings if combined with activity verbs in clause-final position. This indicates that *tun* still retains its agentive meaning in these constructions. Hence, K-states receive the lowest rating because they do not exhibit a Davidsonian event argument. As predicted by Rothmayr (2009: 30–31), D-statives are marginal, i. e. they receive intermediate ratings. This differences between activity and K-states is absent in the construction without *tun*, lexical V2, and in the VP-topicalization, in which *tun* is semantically empty. These two comparisons show that the difference cannot be attributed to the verbs per se but is also construction specific. Furthermore, the lexical V2 condition was rated much higher than the other conditions. The only prediction that could not be confirmed, is that the VP-topicalization should receive higher ratings than the tun-periphrasis group, at least for the stative verbs. However, VP-topicalizations are information structurally very marked. Their acceptability is therefore highly dependent on the licensing by the discourse. The context sentences of the current experiment were constructed with the goal to allow VP-topicalization without, or at least with a small penalty. The results indicate that this goal has not been accomplished.

In sum, experiment 1 was successful, in confirming that *tun* interacts with the meaning of the lexical verb in *tun*-periphrasis but not in VP-topicalizations. It provides a reliable data basis for the discussion of periphrastic *tun*, which often leads to diverging intuitions due to dialectal and register variation interacting with the sometimes subtle differences (see e. g. Erb 2001: 191–197).[42]

This experiment is only a first step in investigating the fine nuances of periphrastic *tun*. However, it provides a starting point for follow-up studies investigating more verb types, such as eventive verbs (*erkennen* 'realize'), configurational verbs (*umgeben* 'surround'), and experiencer verbs (*interessieren* 'interest'), as well as other syntactic constructions, such as VP-pronominalizations and pseudoclefts. Additionally, the overall acceptability of VP-topicalizations should be addressed by providing more supportive contexts in future experiments.

3.5 Chapter summary

In this chapter, I introduced the V2-Reconstruction Hypothesis which says that a V2-moved verb appears in an early position in the clause only to deliver finiteness features, but is always interpreted in its clause-final base position, which is know as reconstruction. I also exemplified that reconstruction is a quite frequent phenomenon in syntax that appears whenever a syntactic element is pied-piped by another element, i. e. it does not move because of its own features. The subsequent sections presented empirical evidence for the validity of the two subclaims of the V2-Reconstruction Hypothesis.

Section 3.2 showed that German exhibits systematic cases in which the lexical content of the finite verb is not interpreted in the V2-position, such as the stem of idiomatic parti-

[42] I thank Hans-Martin Gärtner for bringing Erb (2001) to my attention.

cle verbs, *tun*-insertion in VP-topicalizations, and verb doubling. Additionally, Frisian *wer*-insertion and complementizer agreement illustrated that, if a complementizer is present in C, the inflectional affixes attach to these complementizers without moving a verb into C, and in fact, even blocking verb movement. This proves that not the verb has to move to C but only the finiteness features, thereby supporting the first subclaim of the V2-Reconstruction Hypothesis.

In Section 3.3, I presented three phenomena which reveal that the V2-moved verb must be interpreted in its clause-final base position. Association with focus was used to show that only V2-movement can apparently invert the order between the focus-sensitive operator and the focus constituent without introducing markedness. The problem is solved under the assumption that the finite verb is only interpreted in it clause-final base position. Licensing of verbal NPIs construct a similar argument. V2-moved NPIs are apparently the only NPIs that may escape the c-command domain of their licensor. Again this behavior is readily explained under reconstruction analysis. Third, I have shown that the V2-Reconstruction Hypothesis explains why finite verbs precede sentential negation without escaping its scope. These phenomena show that the finite verb of V2-clauses is interpreted only in its clause-final base position, backing the second subclaim of the V2-Reconstruction Hypothesis.

In Section 3.4, I presented experimental evidence which supports the claims about the different semantic contribution of *tun* 'do', in periphrastic *tun* and VP-topicalization. The results show that *tun* leads to a semantic incompatibility with verbs that denote Kimian states, indicating that *tun* still retains some meaning. Such an incompatibility was not detectable for VP-topicalization indicating that, here, a semantically empty *tun* is inserted as a last resort operation to provide a host for the finiteness affixes in C.

In sum, this chapter introduced the main topic of this disseration, the V2-Reconstruction Hypothesis, and provided a range of empirical phenomena for its validity. Note that the assumption of a generalized reconstruction of the finite verb also allows a systematic simplification of the linguistic description of German clauses because explanations for all V-final counterparts of V2-clauses are needed anyway to analyze embedded clauses. In Part II of this dissertation, I will illustrate that the predictions of the V2-Reconstruction Hypothesis concerning on-line sentence comprehension are borne out, too.

Part II

The role of V2-movement in sentence processing

4 Basics of sentence processing

It is widely assumed that, during sentence processing, the meaning is constructed incrementally from left to right. The comprehension process thereby forms incomplete representations in a top-down approach that is guided by grammatical knowledge (*competence*) (Bierwisch 1983, Crocker 1994, Phillips 2003, Haider 2012). In the beginning of this chapter, I will review general properties of the processing apparatus, some specifics of syntactic parsing and its connection to semantic interpretation. The second section focuses on the concept of incrementality and the strict on-line nature of processing procedures. In Section 4.3, I will discuss four classes of V2-constructions in German that provide a challenge for strict online processing: (i) auxiliary verbs, (ii) modal verbs, (iii) cluster triggering verbs, and (iv) particle verbs. For sentences in which these types of verbs occur in V2-position, the human parser cannot predict the argument structure, which follows the finite verb. Hence, these sentences constitute a structural configuration in which the full interpretation has to be delayed until end of the clause.

4.1 Sentence processing: Apparatus and procedures

This section contains considerations about the basic architecture of a sentence comprehension device, basically following the argumentation in Bierwisch (1983). The processing of natural languages involves a number of subroutines which identify meaningful units such as phonemes syllables etc. from the constant input stream.[1] The processor then combines these units in a non-trivial way which results in a mental representation of the communicated input. I will restrict the discussion to the comprehension process. I assume that, in speech production, similar procedures must apply in reverse order, even though this is by no means an approximate description of speech production, a topic so complex on its own that I couldn't do it justice here.

4.1.1 Levels of representation

The overall communication process aims to transmit information from one interlocutor to another. The transmission process can be modeled in a similar way as for technical communication systems (Shannon & Weaver 1949). Figure 4.1 illustrates a language-based communication, which will be explicated in the following. I will assume that the endpoints of the communication process consist of mental representations that may be envisioned or approximated as activation patterns, i. e. as a specific network activation in the human brain.

[1] Clearly, similar processes must apply in the visual domain, where an input string of signed or written language has to be segmented into morphosyntactic units.

I assume that this mental representation is not ordered in the hierarchical or linear dimension. The audio signal, however, is time-dependent and thereby inherently linear though it does not posses an inherent hierarchical structure. Between these two poles, speaker and addressee, a complex mapping process takes place, which corresponds to the language production and language comprehension devices respectively.

Following Bierwisch (1983: 135), with only slight modifications, I assume four necessary levels of representation of linguistic structure, as given in (1)–(4).[2]

(1) Phonological representation (PR): a sequence of (bundles of) phonetic attributes, grouped in terms of perceptually accessible larger units such as syllable, phonological word, intonation group, etc.

(2) Syntactic representation (SR): a categorized, ordered binary tree imposed on syntactic formatives, which correspond to subsequences of PR (including the empty string for syntactic traces *t*). The hierarchical structure yields unambiguous c-command relations.

(3) Logical representation (LR): a categorized, unordered tree imposed on semantic primes, which are either constants or variables, organized according to functor-argument relations with variable binding.

(4) Contextual Representation (CR): a set-theoretical structure not subject to ordering and tree conditions, determined by the inherent ontology of the mental world (whatever that turns out to be).

In addition, I must assume mapping functions, as in (5)–(8), that relate the levels of representation with its dimensional characteristics, linear order and hierarchical order, to each other. The bracketed terms following the mapping functions should be understood rather as a mnemonic than as a proper description. The mapping functions are sequentially ordered from PR to SR, from SR to LR, etc. Each higher representation includes the mapping processes of the lower orders (s = signal and c = context).

(5) H(s) = PR (Hearing)

(6) P(PR) = SR (Parsing)

(7) I(SR) = LR (Interpretation)

(8) V(LR,c) = CR (Verification)

For the comprehension cascade, we can summarize that the time-dependent speech signal *s* is first enriched with hierarchical information, and, in the next steps, pruned from linear order and hierarchical order. Idealizing even further and neglecting the last transformation

[2] First, I changed the labels of the levels of representation, Bierwisch (1983) uses P, S, LF, and C instead. Second, for the syntactic level, I inserted the additional condition that trees have to be binary because these show unambiguous c-command relations. There, the notion of *c-command* also replaces the notion of *binding*.

to mental states, the comprehension process can be seen as the reconstruction of the hierarchical dimension from a sequential object, as illustrated in Figure 4.1. Likewise, production corresponds to a compression process that maps a hierarchical object onto a sequential order (Kural 2005, Haider 2012).

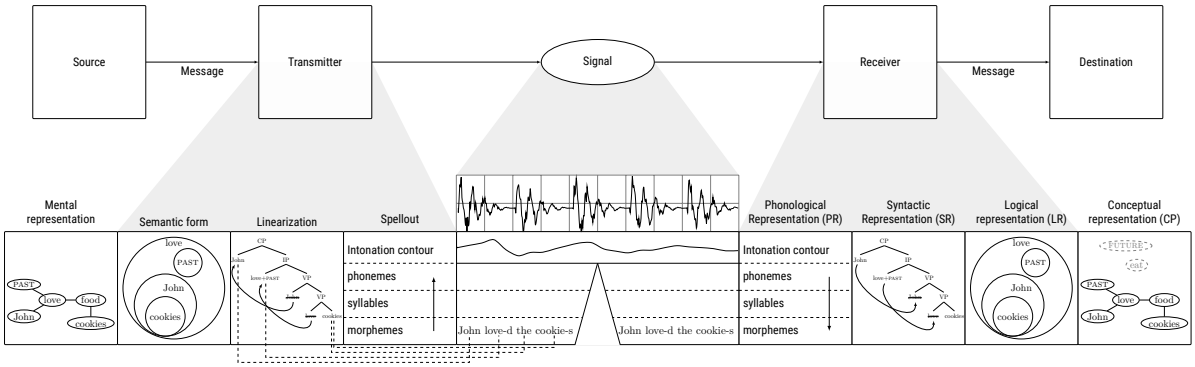


Figure 4.1: Schematic of the language-based communication process

In the following, I will use two terms that must not be confused: The first is the entirety of the devices that take part in the production and comprehension process of natural language, the *human sentence-processing mechanism*, or shortly *processor*, which equals the complete mapping function (8). The second is the *parser*, the device that handles the morphosyntactic analysis, which equals the mapping function P in (6). In this thesis we will primarily be concerned with the parser and its relation to the higher order representations, mostly to LR. The classical example in (9) illustrates that a linear string is not unequivocally linked to a single hierarchical representation but may give rise to structural ambiguities. Even though the two structures might be differentiated by intonational means such as pauses, they don't have to be.

(9) The girl saw the boy with the telescope.
   a. The girl saw [the [boy with the telescope]].
      $\mapsto$ the boy has a telescope
   b. The girl saw [the boy] [with the telescope].
      $\mapsto$ the girl has a telescope

The brackets and the comments in (9a) and (9b) indicate that the difference in meaning correlates with the hierarchical order which is imposed on the input and not of properties of the linear order of the elements in the input string.

4.1.2 Some thoughts about the architecture of the processor

The aim of providing a detailed description of the architecture of the human sentence-processing mechanism is a too ambitious one for the present dissertation. First and foremost there is no doubt that the language processor is part of the general cognitive system, hence I

must give a description of this even larger system. For considerations of the broader perspective the reader is referred to Fodor (1983) and Anderson et al. (2004). Second, the number of possible variations of model parameters is enormous, whereas the predictions and the empirical coverage are often only subtle (Crocker 1994: 246). I will therefore concentrate on a few phenomena that help us to identify some basic parameters that are relevant for the discussion of the processing of V2-structures below.

The two main characteristics of a cognitive processing device can be described with the oppositions *modular* vs. *interactive*, and *serial* vs. *parallel*. Modularity means that the respective procedure will be carried out autonomously, for example, that syntactic analyses are not influenced by the meaning of the constituents but solely guided by syntactic principles. Serial processing defines that only one analysis at a time is generated. Parallel processing, on the other hand, allows that multiple analyses are generated in parallel, of which one will be selected.

The overall picture will surely be a mixed system in which some domains are more interactive whereas others are more autonomous (modular) and some allow for parallel processing while others do not. In accordance with the mainstream literature, I will assume that the human sentence-processing mechanism is, at least in parts, a serial, modular system. Evidence for the serial nature of syntactic analyses comes from experimental investigations of locally ambiguous structures, such as the famous garden path sentence in (10a). The string *the+horse+raced+past+the+barn* immediately receives a structural analysis. When the last word *fell* is encountered, it does not fit the current analysis and a reanalysis process is triggered, which can be measured in (prolonged) reading times, (lowered) acceptability judgments, etc. For sentences as in (10a), the garden path may be so severe that no reanalysis is triggered and the string is discarded as gibberish.

(10) a. The horse raced past the barn fell.
b. meaning: The horse that was raced past the barn fell.
(Bever 1970: 316)

Reanalysis procedures have been found for a range of constructions cross-linguistically. The pure existence of preferences for structural analyses disfavors a parallel account in which several different parses are developed simultaneously. Crain & Steedman (1985), however, demonstrate that the severity of the garden path can be induced, modulated, or canceled by semantic and contextual factors. Crain & Steedman (1985) argue for a weak interaction of the syntactic and the semantico-pragmatic component: The syntactic analysis operates purely on syntactic principles but the semantico-pragmatic component checks the analyzed chunks in certain intervals and may induce a reanalysis. They demonstrate that even severe garden paths can be avoided by providing an appropriate context. More aspects of the relation between syntactic parsing and interpretation will be discussed in the following sections.

4.1.3 The role of grammar in a processing model

Before I will elaborate on the processing routines, a note on the role of grammatical knowledge in language processing seems in order. The different levels of grammar (phonology,

syntax, etc.) provide well-formedness conditions on the levels of representation given in (1)–(4) above (PR, SR, etc.). The grammatical rules specify the targets of the mapping functions. Note that this is not the same as identifying rules of grammar with processing operations (Bierwisch 1983: 158).

Why do we need grammatical rules? Cases of misanalysis are invariably cases in which a locally well-formed structure turns out to be globally ill-formed, such as garden path sentences in (10) or attachment ambiguities, as in (9). However, we do not observe that the parser builds up structures that do not even locally obey the rules of grammar, such as the ungrammatical structure (11b), in which the determiner and the adjective form a constituent with the exclusion of the noun, in contrast to (11a).

(11) the+wild+animal
  a. [the [[wild] animal]]
  b. *[[[the] wild] animal]

Under the assumption that language processing involves several subsequent mapping procedures, grammatical rules operate as check sums on each representation level which ensure that the input for the next mapping function is well-defined. Otherwise every noise that obscures part of the signal will lead to defective mappings and hence to a loss in understanding. But in fact, we observe that also defective signals show a comparably good recoverability, such as utterances in noisy environment, by speakers that show diminished abilities caused by nervousness, drugs, etc., or by non-native speakers that are not in full command of the well-formedness rules. This is explainable if each mapping process has to create a well-formed representation on the next higher level. The specifics of this mechanism is not in the focus of the present discussion but I will assume that a mapping will be attracted by the nearest possible well-formed representation.[3] Two more remarks: The application of such intermediate repairs may ensure comprehensibility but may also lead to reduced acceptability. Second, there is certainly a threshold of defectivity beyond which no recovery is possible. If the output of a mapping function is too far from a well-formed representation the input cannot be mapped onto higher representations.

4.1.4 On-line processing and incrementality

After sketching the general architectural properties of the processor, I must give a more detailed description of how parsing and other processing procedures apply. There is consensus that any parser must, at least partially, employ incremental left-to-right (top-down) parsing. The opposite position would be a strictly head-driven (bottom-up) parsing account in which structures are only projected from the heads. It would predict that arguments and modifiers remain unattached until the governing head is encountered (for a more elaborate discussion see Crocker 1994).

The well-documented subject-first preference in German, a head-final language, is a showcase example for an argument against strictly head-driven parsing, a detailed discussion will

[3] The sketch of relating semi-grammatical sentences to a well-formed correspondent structure in Chomsky (1964) could provide an avenue to a formalization.

follow in Chapter 5. In sentences such as (12), increased reading times are observed for the second noun phrase, if it is a nominative *der Gärtner* (12b). This indicates that the case ambiguous first noun phrase is analyzed as subject and has to be reanalyzed as a scrambled object as soon as a nominative NP is encountered. The fact that the reanalysis effect occurs before the subcategorizing verb has been read implies that the arguments are assigned to structural positions before the head of the structure, here V, is encountered. The subject-first effect therefore provides solid counter-evidence against strictly head-driven (bottom-up) accounts.

(12) German

a. … dass die Direktorin den Gärtner besucht hat.
that [the director.F]NOM/ACC [the gardener]ACC visited has
'…that the director visited the gardener.'

b. … dass die Direktorin der Gärtner besucht hat.
that [the director.F]NOM/ACC [the gardener]NOM visited has
'…that the gardener visited the director.'

The example in (12) also illustrates an important point regarding the incrementality of processing: In the course of left-to-right processing, the interpretation will not always be built up fully incrementally but involves deviation from strict on-line processing. Such deviations are mainly caused by two properties, *underspecification* and *dependence*. Underspecification is a temporal ambiguity of inherent features: The particular element possesses all necessary properties for a mapping to the next higher representation but the properties do fully specify more than one category. Syncretic case-marking would be an example, as exemplified in (13). Case-marking might not be fully unambiguous but the mapping potential of a case-marked DP is inherent. The specific mapping of an underspecified element might be disambiguated later, but the mapping potential does not dependent on the disambiguation, i. e. the phrase *das Buch* in (13a) might be nominative or accusative but never dative or genitive, irrespective of the environment. The mapping potential of the masculine phrases in (13b), in contrast, is restricted to exactly one case, i. e. those DPs are not underspecified with respect to case-marking. A dependent element, in contrast, does not posses all the information for a complete mapping but is contingent on the assignment by another element. Theta roles are a case in point. They are assigned by the predicate. Even with unambiguous case marking the argument is incomplete in this respect, as shown in (14).

(13) *Underspecification*

a. das Buch
the book.NOM/ACC

b. der Roman vs. den Roman
the novel.NOM the novel.ACC

(14) *Dependence*

a. weil der Vater dem Jungen.BENEFICIENT ein Buch mitbringt.
because the father.NOM the boy.DAT a book brings along

b. weil der Vater dem Jungen.EXPERIENCER gefällt.
because the father.NOM the boy.DAT appeals

Deviations from strict on-line processing can be overcome by two strategies: *anticipation* ("decide for one interpretation even though there is a chance it might be wrong") and *delay* ("let's wait and see"). Before I am going to discuss these strategies in more detail, I will show that linearity-breaking effects take place on all levels of representation.

Generality of non-linear processing

I will begin with the phonological representation (PR). The strings in (15a) and (15b) are initially identical, see (15c), and will only be unambigously identified after the relative clause. It is evident that the initial analysis at PR has immediate consequences for the mapping onto the syntactic and semantic structure. In (15a) the initial string is identified as a sequence of a possessive pronoun and an NP. The initial string in (15b), however, consists of a pronoun and an reduced auxiliary followed by an adjective. Thus, in the first case, the initial string is a complex NP, whereas the string in (15b) is a clause.

(15) Ambiguity at PR
a. Their plane, which is unusual, is going to be late.
b. They're plain, which is unusual but good.
c. [ðeər+pleɪn+wɪtʃ+s+ʌnˈjuːˌʒu.əl+…]

The clauses in (16) illustrate deviations from strictly linear processing on the syntactic level (SR). The *wh*-phrase cannot immediately be interpreted as it is encountered. The two variants show that the dislocated element may either act as object, as in (16a), or as subject as in (16b). This string, however, cannot be disambiguated relying on syntactic cues alone.

(16) Ambiguity at SR
a. Who$_1$ did Josef [promise t_1] [Janet will submit the thesis on time]?
b. Who$_1$ did Josef [promise Janet] [t_1 will submit the thesis on time]?

Similarly, scope ambiguities are examples on the level of the logical representation (LR). The examples in (17) show that even though both quantifiers and the relating predicate are encountered the scope domain may not be uniquely identified until the appositive clause of the indefinite is processed.

(17) Ambiguity at LR
a. ∀ > ∃: Every man loves a woman, namely his mother.
b. ∃ > ∀: Every man loves a woman, namely Brigitte Bardot.

Likewise, cases of underspecification can also be demonstrated for the contextual representation (CR), as shown in (18). The identification of the referent of the pronoun *she* does not rely on syntactic or semantic conditions but rather on the contextual information that is presented in the infinitive at the end of the sentence. Clearly, at the time when the pronoun is encountered, an unambiguous identification is not possible.

(18) Ambiguity at CR
Mary$_m$ asked Sally$_s$ where to go, but, you know, ...
a. ... she$_m$ isn't the right person to wait for an answer.
b. ... she$_s$ isn't the right person to give a clear answer.
(Bierwisch 1983: 119)

I have briefly illustrated that non-linear processing is observable on all levels of representation. As already noted, in an incremental comprehension process these cases of non-linearity can be overcome by two mechanisms: anticipation and delay. These two strategies are coupled with two states of the mapping functions which I have defined above. Following Bierwisch (1983: 136–149), I will call these two states *maximal* and *complete* and define them (19) and (20), respectively (see Crocker 1994 for a similar but less elaborate notion).

(19) *Maximality*
$F(s, c)$ is *maximal* in relation to G and the respective mapping function H, P, I, or V iff it is fully specified with respect to the input s (the context c), the grammar G and other principles of contextual interpretation.

As we have already seen above for cases of ambiguity, maximality does not mean that the respective structure will not be altered at a later point. For any initial substring s' of s, such that $s = s's''$ we can define completeness in the following way:

(20) *Completeness*
$F(s', c)$ is complete with respect to a grammar G, the respective mapping function H, P, I, or V and the signal s iff the maximal $F(s, c)$ neither modifies nor further specifies the representations that resulted from $F(s', c)$.

Three noteworthy consequences emerge from these definitions: First, maximality and completeness can be achieved at different levels of representation, i. e. the string in the syntactically ambiguous sentence in (16) is complete with respect to the PR mapping, and the initial strings of (17) and (18) are complete with respect to the PR and the SR mapping. Second, logically, a mapping that is complete is also maximal but not vice versa. Third, it is obvious that ambiguous structures allow a maximal mapping whereas dependent structures do so only if the assigner precedes the dependent. I suggest that these two states also correlate with the two resolution strategies: anticipation generally applies to maximal mappings, whereas delay applies to non-maximal mappings. I will illustrate this association below, mainly for the syntactic mapping.

Causes for non-linearity

Before we proceed to the parsing strategies, I will suggest a tentative motivation for linearity-breaking properties of language structure. Miyamoto & Takahashi (2002) propose the following insight for the difference between *wh*-in-situ and *wh*-ex-situ constructions. They assume that *wh*-arguments need to satisfy two needs: As arguments, they must receive a theta role, in their base position. As quantifiers, they need to mark their clausal scope. Miyamoto &

Takahashi (2002) assume that in Japanese these two functions are realized by two lexical items, as shown in (21). The in-situ *wh*-phrase *nani-o* receives the theta role in clause internal position and the scope is marked by the interrogative particle *-ka* in the clausal periphery. In *wh*-ex-situ languages, such as English, both requirements are satisfied by one lexical item. The *wh*-element is dislocated from its theta-position into its scope marking position in the clausal periphery, as illustrated by the translations in (21) and the examples in (22).

(21) a. Mary-ga **nani-o** katta-to John-ga itta-**ka** watasi-wa kikimasita
Mary-NOM what-ACC bought-DECL John-NOM said-Q I-TOP asked
'I asked what John said Mary had bought'

b. Mary-ga **nani-o** katta-**ka** John-ga kiita-to watasi-wa iimasita
Mary-NOM what-ACC bought-Q John-NOM asked-DECL I-TOP said
'I said John asked what Mary had bought'

(Miyamoto & Takahashi 2002: 143)

(22) a. **What**$_1$ did John say [that Mary had bought t_1]?

b. John said [**what**$_1$ Mary had bought t_1]?

Clearly, this example is not intended to give an explanatory insight into the diverse topic of *wh*-(non-)movement. It should rather illustrate the important point that satisfying multiple requirements of higher order (semantic and contextual interpretation) in a linear string may lead to delayed processing of one of them. In fact, this idea can be generalized: Displacement is the syntactic reflex of satisfying multiple requirements of higher order. This subsumes also cases of topic and focus marking, in which the displacement is information structural tagging. Note, that this perspective on displacement resembles the idea of the Minimalist Program that movement is feature driven (Chomsky 1995: 297–316).

4.2 Incrementality in parsing

In the preceding section, I have presented general ideas about the processing apparatus, the status of syntactic parsing, and the generality of deviation from strict on-line processing. In this section, I will examine parsing procedures during incremental processing in more detail. I will discuss the anticipation strategy in cases of local ambiguity and the delay strategy in filler-gap dependencies. The evidence from parsing suggests that structure building procedures apply locally.

4.2.1 Anticipation: Parsing heuristics

In accordance with most psycholinguistic models, I assume that parsing generates phrase structure left-to-right and top-down (Kimball 1973, Frazier & Fodor 1978, Crocker 1994). This includes that structural assignment/attachment of constituents may begin before the subcategorizing heads are encountered. In such cases, the parser has to predict a structural analysis which may have to be reanalyzed later. This conforms to the strategy that I called anticipation. The mapping that is created hereby is *maximal*, because it conforms to a full-fledged

representation of one possible analysis. If, however, more than one mapping is compatible with the full specification of the input, the behavior of the parser must rely on a decision mechanism which can be described by heuristics.

Two heuristics that have been proven to be very adequate are *Minimal Attachment* and *Late Closure* (Frazier 1978), given in (23) and (24). Similar principles have been proposed under different names (see Kimball 1973) but they can be subsumed under these two notions. Both principles are essentially economy principles: Minimal Attachment prevents the postulation of unjustified structure and Late Closure prevents the anticipation of unjustified interpretation domains.

(23) Minimal Attachment
Attach incoming material into the phrase-marker being constructed using the fewest nodes consistent with the well-formedness rules of the language under ananlysis.
(Frazier 1978: 24)

(24) Late Closure
When possible, attach incoming material into the clause currently parsed.
(Frazier 1978: 20)

Clearly, the Minimal Attachment strategy is the only practical assumption, as Frazier (1978: 25) puts it: "Actually, it is difficult to imagine a parser which does not make use of something like the Minimal Attachment strategy. Such a parser might postulate a monstrous structure [...] upon realizing the word *the*." Even if the assumption of a minimal structural link to the existing structure may leads to a revision process, the prediction of a more elaborated structural link would lead to revision even more often.

The Late Closure principle is actually rather an interpretational than a syntactic principle. From a rigid phrase structure perspective, the attachment of a node within the current clause must be less or equally costly than attaching it to another clausal projection (higher or lower). From a syntactic perspective, it would therefore only be an instance of minimal attachment. For cases in which attachment to the same or to a higher clause is equally costly, as for the embedded clauses in (25), experimental investigation indicated that the parser tends to integrate all possible elements (here *the story*) into the current clause, as in (25a), (Frazier 1978).

(25) a. [Though George kept on reading the story] Sue bothered him.
b. Though George kept on reading [the story still bothered him].
(Frazier 1978: 81)

I will discuss this point in more detail in Section 4.2.4 but for now it shall suffice to say that in absence of specific information, the parser prefers to integrate all possible constituents within the current interpretational unit (the clause), and favors a potential reanalysis, over closing an interpretational unit too early.

4.2.2 Delay: Filler-gap dependencies

A typical instance of delayed syntactic processing involves dislocated elements, i. e. elements that do not appear in their canonical base position[4]. Dislocated DPs have been intensively studied in English, German and several other languages, both theoretically and experimentally, but there are many other syntactic categories that occur dislocated. The primary focus of dislocation research lied on *wh*-movement, i. e. the fronting of interrogative elements, but also relativization, and DP-preposing (topicalization or scrambling) have been investigated. In psycholinguistics, the relation between a dislocated element and its base position is called *filler-gap dependency*, following Fodor (1978). The underlying assumption is that the displaced element, the filler, will be associated with the gap during on-line processing. The filler will be reactived and *inserted* at the gap site. With reference to transformational grammar, Fodor (1978: 427) calls it a *detransformation*.

The model of filler-gap dependencies resembles the concept of empty categories/traces in competence grammars. Psycholinguistic research over the past 30 years has yielded reliable support for the assumption that the dislocated element is reactivated at the base position (e. g. Bever & McElree 1988, MacDonald 1989, Osterhout & Swinney 1993, Shapiro 2000, Omaki et al. 2015), even though counter proposals have been made (Pickering & Barry 1991, Traxler & Pickering 1996). Classical arguments in favor of a filler-gap model are the filled-gap effect and filler reactivation in verb-final languages, which I will review below.

There is wide consensus that the parser posits gaps for fillers as early as possible. This strategy has been most famously phrased by Frazier & Clifton (1989) in their *Active Filler Hypothesis*, given in (26).

(26) *Active Filler Hypothesis*
When a filler has been identified, rank the option of assigning it to a gap above all other options.
(Frazier & Clifton 1989: 95)

This preference is illustrated by example (27). As Clifton & Frazier (1989) report, the preferred reading is the one given in (27a) in which the gap is posited earlier than in the alternative in (27b).

(27) Who did Fred tell Mary left the country.
a. Who_1 did Fred tell t_1 Mary left the country.
b. Who_1 did Fred tell Mary t_1 left the country.
(Clifton & Frazier 1989: 292)

Direct experimental support for the active filler strategy is widely known as the *filled-gap effect* (Crain & Fodor 1985, Stowe 1986). In (28c) the filler *who* has to be related with the object position. Under the active filler hypothesis it is predicted that the processor will initiate the association also in cases like (28d). However, with encountering the lexical element *us*, the

[4]Clearly, in mainstream phrase structure grammars which assume a binary branching structure, any dislocation must correlate with a different hierarchical position. Usually, this comes on a par with a different linear position, except in cases of string-vacuous dislocation.

assignment has to be revised and the filler must be associated with a later gap. This prediction is born out. Longer reading times on the object have been found in (28d) in contrast to both control conditions, (28a) in which no filler-gap dependency is involved, and (28b) in which the filler has already been assigned to the subject position.

(28) My brother wanted to know …
  a. … if Ruth will bring us home to Mom at Christmas.
  b. … who$_1$ t_1 will bring us home to Mom at Christmas.
  c. … who$_1$ Ruth will bring t_1 home to Mom at Christmas.
  d. … who$_1$ Ruth will bring us home to t_1 at Christmas.
  (Stowe 1986: 234)

Several studies have shown that the automated gap-filling effect does only occur at grammatically licit positions and that it is sensitive to lexical and semantic information, such as transitivity and plausibility (Stowe 1986, Stowe et al. 1991, Traxler & Pickering 1996, Wagers & Phillips 2014).

Neurolinguistic research identified two direct neurological correlates that support the establishment of filler-gap dependencies. On the region spanning from the filler until the gap site, left anterior negativities (LAN) have been found, which are typically associated with higher working memory demands that assumably stem from keeping the filler active for integration (Kluender & Kutas 1993b, Kluender & Kutas 1993a, Fiebach et al. 2001). At the gap site, P600 effects have been detected which are modulated by complexity parameters of the filler (subject vs. object and *who* vs. *which NP*), indicating the integration of the filler (gap-filling) (Kaan et al. 2000, Fiebach et al. 2001).

I summarize that the processor integrates phrasal fillers at the earliest position, i. e. a structurally and semantically potential gap site. The (full) interpretation of the filler is therefore delayed until its integration, i. e. the filler cannot be fully interpreted in its surface position. Nevertheless, the gap-filling occurs anticipatory, before the subsequent segment is processed and explicit evidence for the gap is encountered. The processor therefore seeks to keep the processing delay minimal, adhering to a maxim of economy.

4.2.3 Consequences of incremental structure building: Constituency vs. c-command

Phillips (2003) illustrates how incremental structure building diverges from a head driven competence grammar representation. He demonstrates that if syntactic structure is built incrementally in a strict left-to-right order during the course of derivation, the parser may initially create constituents that have to be altered (destroyed) later on. The temporal constituent status of sequences that do not form constituents at a later stage of the derivation, explains why different constituency tests yield conflicting results, as formulated in the predictions in (29).

(29) a. Prediction 1: A constituency test may refer only to those strings that are constituents at the point in the incremental derivation when the test applies.
  (Phillips 2003: 47)

b. Prediction 2: Contradictions between constituency tests arise when those tests apply at different stages in the incremental derivation of a sentence. (Phillips 2003: 51)

c. Prediction 3: Constituents become invisible to syntactic processes as soon as they have been destroyed. (Phillips 2003: 55)

Phillips (2003) argues that coordination is the most liberal diagnostic because coordination applies immediately at the right edge of the first conjunct string: Any constituent that is created during the derivation may be coordinated, as the examples (30)–(32) show.

(30) a. [Wallace will]
b. Wallace will and Wendolene probably won't give Gromit crackers before breakfast.
(Phillips 2003: 47)

(31) a. [Wallace [will give]]
b. Wallace will give and Wendolene will send some crackers to Gromit for his birthday.
c. Wallace will design but won't actually build an exciting new invention for his dog's birthday.
(Phillips 2003: 48)

(32) a. [Wallace [will [give Gromit]]]
b. Wallace will give Gromit and Wendolene will give Preston a shining new collar for walking about town.
c. Wallace will give Gromit and (will) send Preston a shining new collar for walking about town.
(Phillips 2003: 48)

The examples also illustrate how constituency changes over the course of derivation. In (30), the subject and the auxiliary form a constituent (for lack of alternatives). In (31), this constituency is destroyed and the auxiliary forms a constituent with the lexical verb. In (32), this constituency is again disposed because the lexical verb forms a constituent with the indirect object. Example (33) shows that not any arbitrary string can be coordinated.

(33) *Wallace gave his [dog half a dozen] and [sheep a handful of] crackers for breakfast.
(Phillips 2003: 49)

The same accessibility as for coordination does not hold for other constituency diagnostics such as ellipsis (deletion) and topicalization (movement). Phillips (2003) argues that these transformations apply at a later stage of the derivation and therefore can only access currently existing constituents. The example in (34) illustrates such contradictory results for constituency. The two objects of the double object construction may be coordinated[5] as

[5]Crucially, the constituent status in coordination only holds for the first conjunct. The second conjunct must take part in later reanalysis procedures as in non-coordinated structures.

shown in (34a), but the same string cannot be topicalized, i. e. moved to clause-initial position, as in (34b), in contrast to the VP in (34c). The conclusion is that topicalization can only apply at a point at which the temporary constituency between the two objects *Gromit + a biscuit* has already been destroyed.

(34) a. Wallace gave [Gromit a biscuit] and [Shawn some cheese] for breakfast.
b. *[Gromit a biscuit]$_1$ Wallace gave t_1 for breakfast
c. [Like cheese]$_1$ though Gromit does t_1, he can't stand Brie.
(Phillips 2003: 38–40)

The approach of Phillips (2003) demonstrates that principles of grammatic competence are subject to structural properties that result from incremental structure building. Phillips (2003) highlights that, whereas constituency is build and rebuild incrementally, hierarchy (c-command) is maintained monotonically, i. e. no obvious c-command test mismatches occur. In other words, as assembly takes place from left to right, a once established c-command relation will not be destroyed. Such a parsing-compatible phrase structure assembly is only efficient for genuine right branching structures (Kimball 1973, Phillips 1996, Haider 2012).

4.2.4 Incrementality and interpretation

I assume that semantic interpretation must follow the (sometimes incomplete) syntactic analysis. Additionally, I presume that the interpretation ensues the analyses of lower levels as closely as possible. Crocker (1994) proposes the *Principle of incremental comprehension*, which is given in (35).

(35) Principle of incremental comprehension (PIC)
The sentence processor operates in such a way as to maximize the interpretation and comprehension of the sentence at each stage of processing (i. e., as each lexical item is encountered). (Crocker 1994: 251)

This principle involves the notion of *maximality* I have introduced in Section 4.1.4. There, I have stated that *maximal* processing does not need to be *complete*. As it stands, the PIC predicts that the finite verb in V2-sentences participates in incremental interpretation, in the same way as in English sentences. And indeed, Crocker (1994: 261) states that the selectional properties of the finite verb in V2-position can be consulted immediately. Although I generally agree with the considerations in Crocker (1994), I deviate with respect to V2-parsing. I will show that unambiguous thematic information of the finite verb can only be extracted in a restricted number of V2-clauses (Section 4.3). Additionally, in Chapter 5, I will review the literature on German sentence processing with the conclusion that evidence for access of the thematic structure of the verb is only found at the clause-final position.

Independent of V2-movement, we can, however, assert an asymmetry with respect to the incremental interpretation of verbal arguments in head-initial VPs in contrast to head-final VPs. In head-initial VPs, intransitive predicates are complete with encounter of the verb, i. e. an SV string. Even in transitive structures, the objects usually follow the verb directly. Consequently, with the encounter of the object(s), the structure can receive an immediate

interpretation. In head-final structures, on the other hand, all arguments can only receive their complete interpretation when the verbal subcategorizer is encountered. This asymmetry between verb-initial and verb-final structures is observable in parsing effects that have been labeled as *shortsightedness of the parser* by Frazier & Fodor (1978). They deduce the specific parsing behavior (shortsightedness) from the architecture of their two-stage parsing model (*sausage machine*). They assume that the first stage parser is a device with an upper limit of approximately seven segments (≈words). It forms phrase structure packages which are pushed down to the second stage parser. Due to its limited size, the first stage parser cannot attach elements outside of its scope. The second stage parser, on the other hand, integrates the phrase structure packages into the complete phrase marker. The model predicts that attachment preferences can be modulated by two parameters: first, the size of intervening material between attachment site and element to be attached, and second, the size of the unit to be attached. The effects of the two parameters are illustrated in (36) and (37). With increasing length of the material intervening between *read* and *to Mary*, the preference for a local attachment of *to Mary* to the preceding *the letter* increases in contrast to an attachment to the verb *read*. The reason for this is that the high attachment site has left the scope of the first stage parser, as indicated by the dashed box. This preference also leads to misanalysis in cases in which low attachement is illicit, as in (36e).[6]

(36) a. John *read* the letter *to Mary*.
b. John *read* the memo and the letter *to Mary*.
c. John *read* the note, the memo and the letter *to Mary*.
d. John *read* the postcard, the note, the memo and the letter *to Mary*.
e. John *read* the postcard, the note, the memo and the newspaper *to Mary*.
(Frazier & Fodor 1978: 302, 297)

A compensating effect emerges for increasing length of the phrase to be attached. Example (37) shows that small elements are likely to be grouped together with immediately preceding material, as in (37a) in which *out* is preferably attached to *rotten* resulting in the non-existing verb *rot out*, instead of attaching *out* to *threw* resulting in *throw out*. If the new phrase exceeds a certain threshold (length), the preceding constituent and the constituent to be attached will both be sent to the second stage parser separately, as in (37b). As a consequence *out of the window and into the rosebush* will be attached to *threw* by the second stage parser without giving rise to an erroneous attachment to *rotten*.[7]

(37) a. John *threw* the apple that Mary had discovered was rotten *out*.
b. John *threw* the apple that Mary had discovered
was rotten *out of the window and into the rosebush*.
(Frazier & Fodor 1978: 304)

[6]The phrase [*letter* [*to Mary*]] with the indicated structural analysis receives an interpretation such as 'the letter that is intended for Mary/the letter of which Mary is the addressee'. The string *newspaper to Mary* does not allow such an interpretation.

[7]Certainly, the relation between the matrix verb and the particle in (37a) can be marked by prosodic means in speech. This possibility is available for most if not all attachment ambiguities.

This grouping mechanism motivates the stylistic preference of placing short constituents before long constituents. In absence of explicit grammatical markers, this helps to avoid misanalyses by the parser, even though the dispreferred order would not violate grammatical rules.

Crucially, such misanalyses and garden path structures are very rare in German. I assume that due to its head-final VP structure, the thematic properties are assigned later which seems to be a more robust mechanism in this respect. As example (38) shows, the initial string can form two different structures: an embedded relative clause with the string *die* being a relative pronoun, that refers to *Maria*, as in (38a), or an embedded non-finite clause in which *die* is the determiner for *Hunde*, as in (38b). Even without explicit prosodic marking the two structures are both easy to comprehend.

(38) Dann sahen wir Maria die Hunde überraschenderweise …

a. [Dann sahen wir [Maria, [die Hunde überraschenderweise nicht leiden kann,]] an].
then saw we Maria REL dogs surprisingly not like can
at
'Then we looked at Maria who surprisingly doesn't like dogs.'

b. [Dann sahen wir [Maria [die Hunde] überraschenderweise streicheln]].
then saw we Maria the dogs surprisingly pet
'Then we saw Maria surprisingly petting the dogs.'

The natural finding in (39) shows that, in German, the verb *schließt* (literally 'lock, close') and its corresponding particle *ein* (literally 'in', yielding *einschließen* 'include') can be separated by comparably long intervening material. Those sentences do not exhibit attachment problems, which are expected within the two stage parsing model of Frazier & Fodor (1978), as has been illustrated for English in (37a).

(39) Der Begriff Schriften-Software *schließt* jegliche Updates, Upgrades, Erweiterungen, veränderte Versionen und Arbeitskopien der Schriften-Software, an denen dem Lizenznehmer, d.h. einer natürlichen Person und juristischen Person bzw. innerhalb der juristischen Person einer Tochtergesellschaft mit Mehrheitsanteil, hiernach ein Nutzungsrecht eingeräumt wird, *ein*.
'The term font software includes all updates, upgrades, extensions, changed version and working copies of the font software for which the licence taker, i. e. a natural person and legal person or rather within the legal person of an associated company with majority share herewith receives a right to use.'
(from a font license agreement by Elsner+Flake Type consulting, 2008)

However, this asymmetry seems to be restricted to the domain of predicates and its arguments. The attachment of (non-adjacent) adjuncts seems to give rise to the same problems in English (Frazier & Fodor 1978) and German (Hemforth et al. 2000). In both clauses in (40), the relative clause is initially preferably connected to the plural object, which leads to reanalysis as soon as the singluar verb is encountered.

(40) a. The girl applied for the jobs that was attractive.
(Frazier & Fodor 1978: 297)

b. German
Die Frau bewarb sich auf die Stellenanzeigen, die attraktiv war.
the woman applied refl on the job announcements rel attractive was.sg

I summarize that strictly incremental interpretation can be detected for head-initial phrases such as the VP in English, whereas it seems to be absent in the German head-final VP. As a consequence the verb-argument processing of English and German differ, which results in specific misanalyses that are present in English but typically absent in German.

A final note seems appropriate: I certainly assume that the human processor is able to conduct principled analyses of the input. However, I acknowledge that for various reasons a more shallow comprehension process may be executed which is known as the *good enough approach* (Ferreira & Patson 2007).

4.3 Configurationality of V2: The discrepancy between finite verb and lexical head

In Chapter 2, I argued that V2-structures involve two displaced elements, the preverbal constituent and the finite verb itself. Consequently, we expect that German sentence processing must involve the resolutions of these two distance dependencies.

The first dependency concerns the preverbal element. This is the classic case of a phrasal filler-gap dependency, such as for *wh*-elements in English. Because I have assumed that the preverbal element is moved from a clause-internal position below the C-domain, I predict that these elements always have to be connected to their clause-internal positions. In Chapter 7, I will discuss the special status of subject-initial clauses.

The second dependency concerns the finite verb, which originates in its clause-final base position. Similar to the dislocated DPs, I assume that the finite verb has to be reconstructed into the clause-final position. But even if this turns out to be accurate, the question remains whether the verb is actually fully interpreted in its dislocated position. There are two main options: First, the parser uses all information on-line in order to compute a (partial) interpretation of the sentence. Second, the parser relies on a uniform mechanism to generate interpretations for matrix and subordinate clauses, and therefore processes both as V-final structures. At first glance, the first option seems to be more efficient. Why should the processor ignore information that is already available? The answer is that V-final parsing is actually less error prone than the strict incremental approach.

I have assumed that the finite verb only moves to the C-position because the finiteness features cannot move separately without taking the verb along. As a result, verbal elements of different kind may appear in the V2-position. Only thematic verbs in synthetic tense forms provide morphosyntactic elements that are specified for finiteness and provide unambiguous lexical information about the thematic frame that would allow the prediction upcoming elements. In the following, I will present four classes of verbal elements, auxiliaries, modals, cluster verbs, and particle verbs, that may appear in the V2-position and are considerably

defective with respect to thematic information. I will illustrate that a predictive processing would lead to severe garden paths which are, however, not observable. I will exclude cases of lexically ambiguous verbs because different meanings are often derived and do not show a divergent thematic structure. Additionally, in comparison to the configurational cases below, lexical ambiguity is assumably low frequent.

4.3.1 Auxiliary verbs

German only exhibits two synthetic tense forms, the present and the simple past (*Präteritum*). All other tense forms, as well as all passive constructions, involve auxiliary verbs. The highest auxiliary verb carries finiteness inflection and is placed in the V2-position. Some auxiliary verbs take part in more than one verb form, such as *werden* 'will', which is involved in future tense (41a), passive (41b), future perfect (41c), or in its lexical meaning 'become' (41d).

(41) a. Dann wird Peter in die Kneipe gehen.
then becomes Peter in the pub go
'Then Peter will go to the pub.'

b. Dann wird Peter in die Kneipe eingeladen.
then becomes Peter in the pub invited
'Then Peter is invited into the pub.'

c. Dann wird Peter in der Kneipe seinen Spaß gehabt haben.
then becomes Peter in the pub his fun had have
'Then Peter will have had his fun in the pub.'

d. Dann wird Peter in der Kneipe zum Mann.
then becomes Peter in the pub to the man
'Then Peter becomes a man in the pub.'

Similarly, the two auxiliaries *haben* 'have' and *sein* 'be' feature in a range of construction such as copula constructions, past tense, modal use, etc. As is evident by the paradigm in (41), the sentences are identical until the post subject region. Even after the PPs *in die/der Kneipe* no robust prediction can be generated about the thematic structure, depending on the finite verb.

4.3.2 Modal verbs

Modal verbs may also be finite and target the V2-position. As Parodi (2000) notes, modal verbs have a lexical meaning[8] and agree with the subject but they do not project their own argument structure[9]. Modals rather parasitically use the argument structure of the verb in its scope. The examples in (42) show that the subcategorization, i. e. the number of arguments

[8]The type of modality (epistemic, denontic, etc.) may vary depending on the context.

[9]Josef Bayer pointed out that modals could be analyzed on a par with raising verbs: Such verbs take a propositional complement that may receive a theta role, as indicated in (i).

(i) a. MODAL $[\text{PROPOSITION}]_{\theta}$

and the morphological marking of the arguments exclusively depend on the lexical verbs, which appear clause-finally.

(42) a. Dann muss der Student schlafen.
then must the student sleep
'Then, the student hase to sleep.'

b. Dann muss der Student einem Professor ein Buch in das Büro
then must [the student]NOM [a professor]DAT [a book]ACC in the office
bringen.
bring
'Then, the student has to bring a book to the professor in the office.'

c. Dann müssen dem Studenten die Bücher gefallen.
then must.PL [the student]DAT [the books]NOM please
'Then, the books have to appeal to the student.'

d. Dann muss es den Studenten frieren.
then must EXPL [the student]ACC be cold
'Then, the student has to be cold.'

We can conclude that also modal verbs in V2-position do not allow to make predictions about the arguments to follow. These arguments exclusively depend on the clause-final lexical verb.

4.3.3 Clustering verbs: Selecting non-finite complements

In German, as in other V-final languages, some verbs may take non-finite complements with which they form a verb cluster (Haider 2010). As an infinitive, the embedded verb shares the subject with the higher predicate (raising) but may selects additional arguments. Those other arguments are not selected by the higher verb, as shown in (43).

(43) a. Dann versucht der Professor zu schlafen.
then tries the professor to sleep
'Then, the professor tries to sleep.'

b. Dann versucht der Professor seinen Studenten anzusprechen.
then tries the professor his student to address
'Then, the professor tries to address his student.'

c. Dann versucht der Professor dem Studenten die Veranstaltung zu empfehlen.
then tries the professor the student the event to recommend
'Then, the professor tries to recommend the event to his student.'

b. *Also muss [Schelli einen Rausch gehabt haben]$_\theta$.*
thus must Schelli a intoxication had have
'Thus, Schelli must have had a buzz on.'

Even under this analysis, the crucial argument, that the number and type of arguments to come are not predictable by interpreting the modal verb, remains unaffected. The argument structure within the propositional complement of the modal is solely dependent on the predicate inside the complement.

Haider (2010: 276) notes that most cluster triggering verbs do not even thematically specify a subject, as shown in the raising constructions in (44a) and (44b). The number of arguments, case requirements and unmarked word order are solely specified by the embedded verb, as shown by the comparison with the embedded clause in (44c) that lacks the raising predicate *drohen*. Note that the raising verbs in (44a) and (44b) nevertheless agree with the nominative argument. For a thorough overview of German infinitival constructions see Haider (2010: 272–292).

(44) a. Jetzt droht der Wind die Blätter wegzuwehen.
now threats.SG the wind.NOM the sheets.ACC to blow away
'Now, the sheets are in danger of getting blown away by the wind.'

b. Jetzt drohen dem Mann die Zähne auszufallen.
now threaten.PL the man.DAT the teeth.NOM to fall out
'Now, the man is in danger of loosing his teeth.'

c. … dass dem Mann die Zähne ausfallen.
that the man.DAT the teeth.NOM fall out
'… that the man looses his teeth.'

With regard to cluster triggering verbs, I likewise conclude that substantial predictions regarding the argument structure to follow cannot be achieved by relying on information provided by the finite verb in second position.

4.3.4 Particle verbs

A further important instance of discontinuous verb forms are particle verbs. They are morphologically complex and consist of a stem plus a prefixed particle (separable prefix). Crucially, if such a verb is targeted by V2-movement, only the verb stem moves to the left periphery and the particle remains in the clause-final position, as in (45). Particle verb formation is a productive process which can also apply recursively although not without serious consequences (see Haider 2010: 58–61 and Section 2.1.3). Several verb particle combinations obtain an idiosyncratic reading, as the one in (45).

(45) a. …, dass wir mit dem Rauchen aufhören.
that we with the smoking up hear
'… that we quit smoking.'

b. Dann hören wir mit dem Rauchen auf.
then hear we with the smoking up
'Then we quit smoking.'

Clearly, in sentences with idiosyncratic particle verbs, the meaning of the sentence is not predictable at the point at which the finite verb stem is reached, as shown by the contrast of the word pair *mitbringen* 'bring along' and *umbringen* 'kill' in (46).

(46) a. Judith brachte ihre Mutter am Sonntag […] einfach mit.
Judith brought her mother on Sunday simply with.PRT
'Judith simply brought her mother along on Sunday.'

b. Judith brachte ihre Mutter am Sonntag […] einfach um.
Judith brought her mother on Sunday simply for.PRT
'Judith simply killed her mother on Sunday.'

The productive cases do not have such drastic differences in meaning but the combination with the particle can change the argument structure of the verb, as in the examples in (47), which resemble structures that have been investigated by Czypionka et al. (2016).

(47) a. transitive with accusative object
Dann hört die Polizei die Telefongespräche der Verbrecher ∅/an/mit/ab.
then hears the police [the telephone calls of the criminals]ACC ∅/on/with/off
'Then the police hears/listens to/listens in/wiretaps the phone calls of the criminals.'

b. transitive with dative object
Dann hört die Polizei den Telefongesprächen der Verbrecher zu.
then hears the police [the telephone calls of the criminals]DAT to
'Then the police listens to the phone calls of the criminals.'

c. intransitive
Dann hört die Polizei (bei den Telefongesprächen der Verbrecher) weg.
then hears the police at the telephone calls of the criminals away
'Then the police listen uncarefully/turn a deaf ear to the phone calls of the criminals.'

Another facet of the argument structure of particle verbs is illustrated in (48). This example is actually presented by Crocker (1994: 261) to argue that after encountering the strings *Das Mädchen sah* or *Das Buch sah*, the parser could determine the subject position for *Das Mädchen*, as in (48a) and determine that *Das Buch* cannot be an agentive subject of the verb *sehen* 'see'.[10] However, as the example in (48b) shows, there is a particle verb *aussehen* 'appear' that does not require an agentive subject. Hence, the parser cannot draw any robust conclusion that is exclusively based on the initial string, at least not without unambiguous case marking, restricting context etc.

(48) a. Das Mädchen sah das Buch.
the girl saw the book
'The girl saw the book.'

b. Das Buch sah alt und wertvoll aus.
the book saw old and valuable out.PRT
'The book appeared to be old and valuable.'

As indicated in example (46), the distance between the verb stem and the particle can theoretically be of any length due to intervening modifiers, see Bierwisch (1983: 146–147) and also (39). Consequently no solid prediction regarding the content to follow can be made for particle verbs, and in many cases it is not even predictable whether a particle will follow at all.

[10] Both nouns are neuter in German. Neuter nouns show case syncretism of nominative and accusative singular (see Section 5.1.1).

4.3.5 Summary: A uniform parsing mechanism for V2-clauses

In sum, we have seen that in many cases in which a finite verb appears in V2-position, it does not allow substantial predictions about the arguments to come because these are selected by the corresponding non-finite verb that is located in clause-final position. This configuration was shown for non-thematic verbs that take part in all but two tense forms in German and all passive structures, for modal verbs, and for clustering verbs. These three groups can be subsumed under one structural analysis, namely the verb cluster formation. The higher verbal element bears finiteness features and moves to the V2-position in matrix clauses. The lower verb provides the argument frame and selects the arguments. Crucially, in all cluster formations, the lexical head that determines the argument structure is always in the clause-final position, due to its non-finiteness. Additionally, I discussed particle verbs which share one property with verb cluster patterns, namely that they form a discontinuous verb form. Only the finite verb moves to V2-position and the particle remains in the final position. Hence, lexical specification can only be achieved after combining verb and particle, i. e. at the end of the clause.

In addition, it must not be neglected that all embedded clauses in German conform to a verb-final structure.[11] Hence, I presume that the processing of German sentences must be able to cope with V-final structures in an efficient way. Now, considering the cases discussed above, in which a full interpretation is delayed until the clause-final position, it seems intuitive that these structures do not impose a problem, because V-final parsing is a necessary part of the processing device anyway. Instead, the following question suggests itself: Why should the processing mechanism make predictive use of elements that are rather useless or even misleading in a large number of cases instead of relying on a uniform verb-final parsing mechanism? Exactly that latter consideration is central to the reconstruction hypothesis.[12]

4.4 Chapter summary

In this chapter, I introduced the basic ingredients for the investigation of how V2-clauses are processed. The first section introduced the basic considerations regarding the processing device of human language. I concluded that such a system must operate on several levels of linguistic representations. The mapping from the input signal onto the final level of interpretation proceeds mostly incrementally, and on-line. A closer inspection, however, revealed that deviation from strict on-line processing may affect all levels of representation. I have classified these deviation in two groups: underspecification and dependence.

In the second section, I focused on processing routines that are involved in incremental structure building. Within the syntactic domain, I discussed two processing strategies, which each relates to one of the two groups of deviations from on-line processing: *Anticipation* subsumes parsing heuristics that allow premature decisions for underspecified (ambiguous)

[11] Embedded V2-clauses are ignored here.

[12] Although he rejects that conclusion, Crocker (1994: 260–261) suggested a delayed processing of the finite verbs in V2-structures: "If we assume the traditional gap-filling strategies, then German and Dutch hearers would be forced to delay the use of verb's selectional information until the end of the sentence, after all the complements have been parsed, the verb's trace identified, and thematic assignment performed."

structures. The attachment preferences can be modeled by only two principles: *Minimal Attachment* and *Late Closure*. The strategy for incomplete dependence structures is *Delay*. I discussed filler-gap dependencies as a prototypical case in which the interpretation of a dislocated element is delayed until its reactivation at its base position. Furthermore, I reported that constituency diagnostics indicate that structure building in English proceeds incrementally, whereby some elements may form a constituent only temporarily, whereas c-command relation are maintained monotonically. With reference to classical examples of misanalysis (garden-path sentences), I argued that interpretation in English head-initial VPs may proceed highly incremental which causes these robust misanalyses. The fact that comparable garden-path effects are basically absent in German is a first indication that structure building and interpretation routines in German may not be identical to the ones in English. I suggested that these differences originate from the contrary headedness of the VPs in German and English.

In the third section, I emphasized that V2-clauses in particular would give rise to frequent misanalyses under an incremental processing hypothesis. Such misanalyses, however, are basically absent in German. I discussed four frequent configurations: non-thematic verbs, modal verbs, clustering verbs and particle verbs. In all configurations, the verbal complex consists of a finite verb in V2-position and an element in the clause-final base position. The interpretation of the predicate is contingent on the element in the clause-final position. I therefore suggested that V2-clauses in German are processed in the same way as V-final clauses.

In sum, this chapter introduced the concept of on-line language comprehension. I illustrated that deviations from strict on-line processing occur regularly and give rise to two processing strategies, *anticipation* and *delay*. I argued that processing of English clauses builds on anticipation which may result in distinct misanalyses (garden path). From the absence of comparable misanalyses in German V2-clauses, I concluded that processing of German main clauses resorts to delayed interpretation of the verb at the clause-final position. This hypothesis of obligatory verb reconstruction will be checked against experimental results of German sentence processing in the following chapters.

5 Processing of German clauses

In this chapter I review the literature about sentence processing in German. I will first discuss effects of argument ordering in the middle field (scrambling), mostly in V-final clauses. Subsequently, I will discuss effect of XP-fronting, i. e. moving one argument into the prefield of V2-clauses. The discussion of these two instances of argument dislocation in German will provide the baseline for the inspection of verb-related processing effects in Section 5.3. The gathered experimental findings indicate indicate that meaning-related information of the verb does not influences the processing of arguments in German but rather support the hypothesis that the full interpretation of the verb is delayed until the clause-final position.

5.1 Scrambling

Scrambling is a term for the reordering of constituents within the clausal domain (middle field), notably the extended VP (incl. vP and IP). It therefore contrasts with the placement of constituents into the clausal left periphery (*wh*-movement, topicalization, fronting, etc.) and into the right periphery (extraposition).

First, I want to ensure that scrambling in German is an instance of displacement, comparable to filler-gap dependencies, which shows reactivation effects of the displaced element at the base position. For short scrambling Clahsen & Featherston (1999) and Featherston (2001) report results from two cross-modal lexical priming studies which indicate that dislocated NPs are reactivated at their base position. In both structures, (1) and (2), the probe, which is identical to the dislocated element, received shorter reaction times at the gap site (#2), in comparison to the control site (#1). The shorter reaction times for the matching target indicate that the filler is reactivated at the gap site (#2) which facilitates the lexical activation of the probe and reduces the reaction time in the lexical decision task[1].

(1) a. Nach zwei Tagen Streit sprach der Richter [das Geschäft]$_1$ [dem ziemlich
after two days dispute awarded the judge the business the rather
überraschten #1 Andreas] #2 t_1 zu.
surprised Andreas to
'After two days of dispute the judge awarded the business to the rather surprised Andreas.'

b. identical probe: *Geschäft* 'business', unrelated probe: *Wagen* 'car'
(Clahsen & Featherston 1999: 426)

[1] In a lexical decision task, participants have to decide whether a given string is an actual word or a non-word. Because in the target items both identical and unrelated probes are actual words, the filler items contained also non-words.

(2) [[So ein Haus]$_1$ [einer völlig normalen #1 Kundin] #2 t_1 verkaufen]$_{VP2}$ konnte nur
Such a house a totally normal customer sell could only
Maria t_2.
Maria
'Only Maria could sell such a house to a totally normal customer.'
– only identical probes, such as *Haus* 'house' – (Featherston 2001: 94)

In the following, I will look at the specific processing effects that arise from non-canonical argument ordering. For this, I divide the discussion into cases in which the arguments show unambiguous case marking, which allows immediate identification of non-canonical order, and cases with ambiguous case-marking, which gives rise to (temporary) ambiguities. We will see that the (lack of) unequivocal formal marking modulates the temporal locus of the experimental effects.

5.1.1 Unambiguous case marking

The linear order of arguments in the German middle field shows a linearization preference in which the subject is realized as the first argument. Subsequent arguments are preferably realized in the order *dative (indirect object) before accusative (direct object)* (see the *linear precedence rules* in Uszkoreit 1986). The validity of these linearization preferences have been empirically confirmed with reaction times and accuracy measures in comprehension and production studies, and in acceptability judgments (Bayer & Marslen-Wilson 1992, Pechmann et al. 1996, Rösler et al. 1998, Röder et al. 2000, Bornkessel et al. 2002). On-line methods have revealed prolonged reading times on initial unambiguously case-marked objects (Scheepers 1997).

Several ERP studies investigated transitive (3) and ditransitive clauses (4) with scrambled, unambiguously case-marked arguments and provide robust evidence for the processing difficulties of non-canonical argument ordering. On the first argument position, initial dative or accusative objects result in a negativity which is located in fronto-central or anterior sites (Rösler et al. 1998, Bornkessel et al. 2002, 2003a, Schlesewsky et al. 2003, Bornkessel & Schlesewsky 2006b). This negativity emerges shortly after the onset of the case-marked determiner (350-400ms), and is absent for case marked pronouns (Schlesewsky et al. 2003). It is commonly interpreted as a reflection of an increased processing load (Bornkessel & Schlesewsky 2006b) and, more specifically, as a reflection of working memory demands due to the storing of the argument for later integration (Rösler et al. 1998). On the second NP, non-canonical orders evoke a posterior positivity (300–400ms) which is detectable for DAT≺NOM order (Bornkessel et al. 2002, 2003b), and more pronounced for other non-canonical orders such as ACC≺NOM, DAT≺ACC, and ACC≺DAT (Rösler et al. 1998). Bornkessel et al. (2003b: 286-290) interpret this positivity as an indication of thematic reanalysis induced by a non-canonical argument order.

(3) a. NOM≺ACC
... dass der Jäger den Gärtner besucht.
that [the hunter]NOM [the gardener]ACC visits
'...that the hunter visits the gardener.'

b. ACC≺NOM
... dass den Jäger der Gärtner besucht.
that [the hunter]ACC [the gardener]NOM visit
'... that the gardener visits the hunter.'

c. NOM≺DAT
... dass der Jäger dem Gärtner hilft.
that [the hunter]NOM [the gardener]DAT helps
'... that the hunter helps the gardener.'

d. DAT≺NOM
... dass dem Jäger der Gärtner hilft.
that [the hunter]DAT [the gardener]NOM helps
'... that the gardener helps the hunter.'
(Bornkessel et al. 2002: B24)

At the third argument position of ditransitive structures as in (4), Rösler et al. (1998) report a long-lasting posterior positivity and a fronto-central negativity (357–625ms) for the non-canonical order NOM≺ACC≺DAT (in contrast to NOM≺DAT≺ACC) on the determiner and the noun. At the clause-final verb, non-canonical orders lead to a posterior negativity (31–500ms) (Rösler et al. 1998: 166).

(4) Dann hat [der Vater] [dem Sohn] [den Schnuller] gegeben.
then has [the father]NOM [the son]DAT [the pacifier]ACC given.
'Then the father gave the pacifier to the son.'
(Rösler et al. 1998: 153)

I summarize that explicitly marked non-canonical argument order gives rise to immediate processing responses with initial negativities in response to the mismatch and later positivities indicating a reanalysis.

5.1.2 Ambiguous case marking

Many studies have investigated the processing of clauses with (partially) case-ambiguous arguments. In German, only masculine singular nouns show morphologically distinct forms for nominative and accusative, as shown in Table 5.1. Due to this case syncretism, we can in-

	Nominative	Accusative	Dative	Genitive
masculine DP	der/ein Mann	den/einen Mann	dem/einem Mann	des/eines Mannes
neuter DP	das/ein Ding		dem/einem Ding	des/eines Dinges
feminine DP	die/eine Frau		der/einer Frau	
proper name	Josef			Josef's
plural DP	die Männer/Frauen/Dinge		den Männern/Frauen/Dingen	der Männer/Frauen/Dinge
bare plural (m, n)	Männer/Dinge		Männern/Dingen	∅
bare plural (f)	Frauen			∅

Table 5.1: Case marking and syncretism in German

vestigate the default parsing process by constructing initially ambiguous clauses that will be disambiguated at a later point. I noted that German shows a subject-first preference, which is indicated by processing difficulties for initial non-nominative arguments. Unsurprisingly, this preference prevails also with case-ambiguous arguments. If the first encountered argument is case-ambiguous, though compatible with nominative case, it will be initially interpreted as a subject. This subject-first preference is indicated by reanalysis processes that occur if the unambiguous nominative-marking of another argument, as in (5a), or the agreement on the verb, as in (5b), resolve the ambiguity towards a non-subject interpretation of the first argument.[2] At the point of such a *late* disambiguation, a structural reanalysis has to take place. This is detectable by increased reaction times and decreased acceptability judgments (Bader & Meng 1999, Scheepers et al. 2000, Bader & Bayer 2006). Generally, disambiguation through the clause-final verb (agreement) is more severe than disambiguation by arguments (Bader & Bayer 2006: 103). In on-line measures, these reanalysis effects manifest in form of longer reading times for object-initial orders immediately at the disambiguating element (Bayer & Marslen-Wilson 1992, Bader & Lasser 1994, Scheepers et al. 2000, Kretzschmar et al. 2012). Similarly, in ERP experiments, such effects turn up immediately at the disambiguating region as well. In an initially ambiguous object-initial clause, a P600 (Friederici et al. 2001), an N400 (Schlesewsky & Bornkessel 2004: 1217), and both (Mecklinger et al. 1995) are reported at the disambiguating clause-final verb. The effects are interpreted as the reflection of a reanalysis process.[3]

(5) a. … dass die Mutter der Schüler angeschrien hat.
that [the mother]NOM/ACC [the pupil]NOM shouted at has.3SG
'… that the pupil shouted at the mother.'

b. … dass die Mutter die Schüler angeschrien haben.
that [the mother]NOM/ACC [the pupils]NOM/ACC shouted at have.3PL
'… that the pupils have shouted at the mother.'

In sum, we observe immediate local responses that correspond to reanalysis processes during the parsing of non-canonical argument orders. These effects either turn up at the point of disambiguation or at the unambiguously case-marked, non-initial arguments. In unambiguous cases, the reanalysis is preceded by an increased processing load at the first argument. Such mismatch or memory stacking effects are logically absent in ambiguous clauses.

5.2 XP-fronting

In addition to scrambling, German exhibits a second kind of argument reordering, to which I will refer here as *XP-fronting*. In contrast to scrambling, the leftward moved constituent targets a clause peripheral position, i. e. a specifier position in the C-domain. This position

[2] Bader & Bayer (2006: 87-104) refer to these two types as *nominal disambiguation* and *verbal disambiguation*, respectively.

[3] For arguments in favor of an interpretation of the N400 component as reanalysis, see Schlesewsky & Bornkessel (2004: 1218, fn. 2).

may be typically occupied by (topicalized) DPs, *wh*-elements, or adverbs but, as has been discussed in Chapter 2, basically every phrasal constituent may occupy this position. The location of this position is indicated by the two following observations: In V2-(main) clauses, the fronted element obligatorily precedes the finite verb and in embedded clauses it obligatorily precedes the subject. This position also marks an important contrast to scrambling. Following our assumptions above, the Spec-CP position is a position that is usually filled through movement.[4] Hence, the processor may immediately start the filler-gap parsing by encountering this position. There is simply no possibility for assuming that the fronted element is in its base position. I will restrict the discussion to cases of argument fronting. Clearly, the specifics of (un)ambiguous case marking of DPs in the prefield are identical to those of the scrambled DPs discussed for in Section 5.1 above, see especially Table 5.1. As in the preceding section, I will first discuss cases of unambiguous marked arguments before I will examine cases with an ambiguous initial argument.

5.2.1 Unambiguous case marking

Sentences with object-before-subject order show longer reaction times and lower acceptability judgments than sentences with canonical subject-before-object order (Hemforth 1993: 157-170). In on-line measures with simple transitive sentences, as in (6), the following effects are reported: Object-initial orders evoke longer reading/reaction times on the first DP, the verb, and the second DP (Bayer & Marslen-Wilson 1992, Hemforth 1993: 157-170, Konieczny 1996, Fanselow et al. 1999, Weskott 2003). Scheepers (1997: 147–160) notes that the effect on reading times for unambiguously accusative-marked initial DPs is larger in scrambling contexts than for XP-fronting.

(6) a. Der kluge Onkel besuchte den kleinen Jungen.
[the smart uncle]NOM visits [the small boy]ACC
'The smart uncle visits the small boy.'

b. Den klugen Onkel besuchte der kleine Junge.
[the smart uncle]ACC visits [the small boy]NOM
'The small boy visits the smart uncle.'

(Hemforth 1993: 158)

In ERP, sentences with non-canonical word order and unambiguously case-marked arguments show a lasting left anterior negativity (LAN) starting from the first dislocated element until the end of the second noun phrase (Matzke et al. 2002, Felser et al. 2003). This negativity is interpreted as an increased working memory demand caused by holding material in working memory for delayed integration. Matzke et al. (2002) report an additional N400 at frontotemporal sites on the second DP. Felser et al. (2003) report a similar early frontal negativity on the clause-final verb. The interpretation of this negativity remains inconclusive.

In sum, unambiguously case marked object-initial clauses show long-lasting processing difficulties that last until the base position of the fronted element. This is reflected by increased reading times and LAN-effects.

[4] The only unequivocal exception in which Spec-CP is filled by an element lacking a base position, is the case of expletives, see Section 2.1.4.

5.2.2 Ambiguous case marking

Similar to the scrambling cases above, the processor shows a preference for analyzing case-ambiguous fronted XPs, such as in (7), as subjects by default. This subject-first preference is evident in prolonged reaction times and lowered acceptability judgments for non-canonical orders (Bader & Bayer 2006). Analogously, in on-line measures, prolonged reading times are found immediately at the disambiguating element in declarative clauses (Bayer & Marslen-Wilson 1992, Hemforth 1993), *wh*-interrogatives (Schlesewsky et al. 2000), and relative clauses (Schriefers et al. 1995). In ERP studies with ambiguous intial arguments, the following effects were found: At the disambiguating second argument the non-canonical order evoked a frontotemporal N400 and a posterior positivity (Matzke et al. 2002, Bornkessel 2002, Frisch et al. 2002, Mecklinger et al. 1995)[5].

(7) a. Die kluge Tante besuchte den kleinen Jungen.
[the smart aunt]NOM/ACC visits [the small boy]ACC
'The smart aunt visits the small boy.'

b. Die kluge Tante besuchte der kleine Junge.
[the smart aunt]NOM/ACC visits [the small boy]NOM
'The small boy visits the smart aunt.'

(Hemforth 1993: 158)

The subject-first preference is not restricted to German but has also been detected in other languages, such as Dutch (Kaan 1997) and Basque (Erdocia et al. 2009). Moreover, Weskott (2003) shows that this preference can be mitigated by increasing the inferability of the fronted object from the context and that the effect can even be canceled through syntactic priming of an object-before-subject structure.

In sum, I conclude that XP-fronting results in long-lasting processing demands which indicate a restructuring process that needs to hold the displaced element (filler) active in memory until the reconstruction site (gap). This is reflected by prolonged reading times and a LAN effect in ERPs. Scrambling, on the other hand, is more local. The reordered constituents never left the head domain, i. e. the extended VP. Therefore, no heavy restructuring has to take place but only local reranking/reordering. In case of local ambiguities, however, the results of both structures are almost identical. This is not surprising if we consider the process in detail. After encountering an ambiguous prefield argument, the processor will reconstruct it immediately into the highest VP internal position, i. e. the subject position. After this operation, all subsequent reanalysis processes are identical to scrambled orders in the middle field.

[5]The topography of the negativity reported in Mecklinger et al. (1995) is different: right lateralized, posterior. However, Mecklinger et al. (1995) used material in which the syntactically disambiguating auxiliary was preceded by a semantic disambiguation caused by the lexical meaning of the participle, which induced the N400.

5.3 The processing influence of the verb

Processing effects of verb movement are considerably understudied. Evidence for the processing impact of verbs is mostly indirect and falls in two main classes: first, the interaction of the verb position with effects of argument processing and second, the influence of verb position on more general sentence processing routines, such as attachment and scope computation. In the last subsection, I will review the few direct investigations of processing verbs in sentences.

5.3.1 Thematic processing

The most direct role that the verb may play in on-line processing is the assignment of thematic roles to its arguments, thereby predicting the number and type of arguments and integrating these based on the verb frame. Hence, German V2-clauses could contrast quite sharply with their V-final counterparts because, in the former, the verb information may be early available for incremental processing. In the latter, the verbal elements follow all of the arguments. Hence, the verb frame cannot be accessible during the processing of the arguments. In this respect, experiencer object verbs, such as *verblüffen* 'baffle', constitute useful test cases because they have shown to exhibit an argument ordering that deviates from agentive verbs, such as *zerreißen* 'ripp up'. Experiencers are preferred to be linearized as the first argument, although they show the same case marking as objects of canonical agentive verbs, i. e. accusative or dative.[6] In contrast to the subject-first preference, these verbs are said to exhibit an *experiencer-first* preference (see Verhoeven 2015, Temme & Verhoeven 2016). Building on the reliable effect of non-canonical word order (scrambling) reported in Section 5.1, Schlesewsky & Bornkessel (2004) discuss the influence of verb specific information on argument ordering. In sentences, as in (8), they contrast agentive verbs (*folgen* 'follow'/*drohen* 'threaten'), which show an unmarked subject-before-object order (8a), with experiencer object verbs (*gefallen* 'please'), which have an unmarked object-before-subject order (8b). At the clause-final verb, they report higher processing costs (early parietal positivity) for experiencer object verbs, which is detectable with both argument orders subject-before-object, and object-before-subject. Schlesewsky & Bornkessel (2004) conclude that at the clause-final verb, the exceptional thematic hierarchy of experiencer object verbs induces a revision process.

(8) a. … dass der Mönch dem Bischof folgt/gefällt, obwohl …
that [the monk].NOM [the bishop].DAT follows/appeals, although
'… that the monk follows/is appealing to the bishop.'

b. … dass dem Mönch der Bischof folgt/gefällt, obwohl …
that [the monk].DAT [the bishop].NOM follows/appeals, although
'… that the bishop follows/is appealing to the monk.'

(Schlesewsky & Bornkessel 2004: 1215)

[6] Whether the argument order for experiencer object verbs really show a inherent preference for object-initial ordering is still a matter of current research. At least we can state that the subject-first preference for these verbs is significantly weaker than for agentive verbs (see Temme & Verhoeven 2016 and references therein).

Bornkessel (2002: 99–116) investigates the same argument order contrast for V2-clauses in which the verb information is present in advance of the arguments, as in (9). Hence, under the assumption of incremental processing, we expect that the argument order and the verb classes will interact, i. e. that subject-before-object order is preferred after agentive verbs and object-before-subject order is preferred after experiencer object verbs.

(9) a. Vielleicht droht/gefällt der Bäcker dem Regisseur seit der Party.
perhaps threatens/pleases [the baker]NOM [the director]DAT since the party

b. Vielleicht droht/gefällt dem Bäcker der Regisseur seit der Party.
perhaps threatens/pleases [the baker]DAT [the director]NOM since the party

c. Vielleicht droht/gefällt Stefan dem/der Regisseur seit der Party.
perhaps threatens/pleases Stefan.NOM/ACC/DAT the.DAT/the.NOM director since the party

(Bornkessel 2002: 100)

Bornkessel (2002) reports that there are no effects detectable at the verb. This means either, that the differences of the two verb classes are too small to detect, or that the two verb classes are not processed differently at this point. In the unambiguously case-marked conditions, the initial dative DP (9b) elicited a positivity in the 300–900 ms window in contrast to the nominative DP (9a). Crucially, this effect was present for both verb types, and showed only slight topographical variation with respect to the verb types. For the initially case-ambiguous clauses, the dative-before-nominative order elicited a robust N400 effect at the disambiguating NP2 for both verb types. Agentive verbs additionally showed a weak P600 effect for dative-before-nominative order which indicates that after disambiguation a reanalysis of the object-before-subject order is initiated. This reanalysis is absent for experiencer verbs. In sum, the experiment showed a robust nominative-first preference for both verb types. The results of the first experiment suggest that the thematic structure of experiencer verbs is exceptional. This is further supported by a thematic reanalyses process that was detected only for agentive verbs at the clause-final position. However, the results of the experiment do not indicate that the verb information guides the process of constructing a thematic hierarchy. Crucially, the results suggest that even though the verb information is available before the arguments are processed, the effects are identical to the verb-final structures with respect to the components as well as in their temporal occurrence. "Therefore, the mechanisms responsible for the establishment of thematic relations between arguments also appear to operate without drawing upon verb-specific information, even when this information is available" (Schlesewsky & Bornkessel 2004: 1227).

In a similar way, Scheepers et al. (2000)[7] investigated the influence of verb-mediated thematic information on argument ordering. They contrasted experiencer subject verbs, such as *fürchten* 'frighten', with experiencer object verbs, such as *ängstigen* 'fear', in V2 and V-final clauses, as shown in (10).[8] In both clause types, the NP1 *die strenge Lehrerin* 'the strict

[7] The reported experiments are also published in Scheepers (1997: 123-146).

[8] Scheepers et al. (2000) refer to experiencer subject verbs with with *psychological statives* and to experiencer object verbs with *psychological causatives*.

teacher' is case-ambiguous between nominative and accusative. In acceptability judgment studies, Scheepers et al. (2000) stated that the object-before-subject order gave rise to higher acceptability judgments for experiencer object verbs and that the acceptability could even be enlarged by using an inanimate subject. This indicates that experiencer object verbs have a stronger tendency for object-before-subject order than experiencer subject verbs, which might be reflected in on-line measures as well. The predictions concerning (10) were tested in an eye tracking study.

(10) a. V-final–S≺O vs. O≺S
Dass |$_{NP1}$ die strenge Lehrerin |$_{NP2}$ der stillen Schüler/ den stillen Schüler
that the strict teacher [the quiet pupil]NOM/ [the quiet pupil]ACC
|$_{ADV}$ ein wenig |$_{Verb}$ ängstigte/ fürchtete, | hatte der Psychologe von einigen
a bit fears/ frightens had the psychologist from some
Klassenkameraden erfahren.
class mates get to know

b. V2–S≺O vs. O≺S
Offenbar |$_{Verb}$ ängstigte/ fürchtete |$_{NP1}$ die strenge Lehrerin |$_{NP2}$ der stille Schüler/
obviously fears/ frightens the strict teacher [the quiet pupil]NOM/
den stillen Schüler |$_{ADV}$ ein wenig, | was der Psychologe von einigen
[the quiet pupil]ACC a bit what the psychologist from some
Klassenkameraden erfahren hatte.
class mates get to know had
'Obviously the strict teacher frightened the quiet pupil a bit, …' or
'Obviously the quiet pupil feared the strict teacher a bit, …'
(Scheepers et al. 2000: 115–117)

In V2-clauses, experiencer subject verbs elicited longer reading times in early (first pass reading times) and late measures (regression path duration). Expectedly, no effect turned up at the case ambiguous NP1. In both clause types the object-before-subject order evoke longer reading times in early measures (first path reading times) only on the disambiguating NP2. The late measures (regression path duration) revealed longer reading times for the object-before-subject order on the disambiguating NP2, the following adverb and the verb in V-final clauses. Additionally, the late measures also revealed an interaction of verb type and argument ordering on the clause-final element, i. e. the adverbial in V2-clauses and the verb in V-final clauses. This interaction points in the expected direction, namely that the preference for SO and the dispreference for OS is more pronounced in experiencer subject verbs. This late effect is still visible in the answer accuracy of the comprehension question which followed the items: Whereas no differences were detected within canonical subject-initial sentences, answer accuracy after object-initial clauses were significantly lower only for the experiencer subject verbs, irrespective of the verb position (V2 vs. V-final). This indicates that the thematic information of the verb influences processing only at a late point during processing German clauses – in fact, so late that it spills over to subsequent tasks. That these effects turn up at the end of the clause also in V2-clauses is unexpected under an incremental processing hypothesis, but matches the V2-Reconstruction Hypothesis.

Scheepers (1997: 171-186) investigates the processing of thematic hierarchies by constrasting verbs that take a goal-PP, like *werfen* 'throw', with verbs that select a theme-PP, such as *bewerfen* 'pelt', as shown in (11). An acceptability pretest indicated that verbs which take theme-PPs show a stronger preference for an NP≺PP order in (11c), compared to verbs which take a goal-PP.

(11) a. PP-goal–NP≺PP
Der Junge warf den spitzen Stein gestern auf die neue Garagentür, ...
the boy threw the pointed stone yesterday at the new garage door

b. PP-goal–PP≺NP
Der Junge warf auf die neue Garagentür gestern den spitzen Stein, ...
the boy threw at the new garage door yesterday the pointed stone

c. PP-theme–NP≺PP
Der Junge bewarf die neue Garagentür gestern mit dem spitzen Stein, ...
the boy pelt the new garage door yesterday with the pointed stone

d. PP-theme–PP≺NP
Der Junge bewarf mit dem spitzen Stein gestern die neue Garagentür, ...
the boy pelt with the pointed stone yesterday the new garage door

e. V-final scheme
Der Junge hat [NP/PP]1 gestern [NP/PP]2 geworfen/beworfen, ...
the boy has [NP/PP]1 yesterday [NP/PP]2 thrown/pelted

(Scheepers 1997: 172)

The self-paced reading experiment revealed a general NP≺PP preference (shorter reading times) on the first argument and the sentence-final spillover region. This preference was more pronounced for verbs with theme-PPs, which is in accordance with the acceptability judgments. However, the effects were independent of the verb position and therefore plausibly stem from properties of the arguments. No effects could be detected at the second argument. At the clause-final verb, Scheepers (1997) detected an interaction of argument order and verb type: Goal-PP verbs (*werfen*) show shorter reading times after PP≺NP order whereas Theme-PP verbs (*bewerfen*) show shorter reading times after NP≺PP order. Thus, processing advantages due to argument order which is consistent with the thematic frame of the verb are detectable only for clause-final verbs. The experiment did not indicate advantages during processing of the argument patterns matching the thematic frame, which could be accessible early on in V2-clauses.

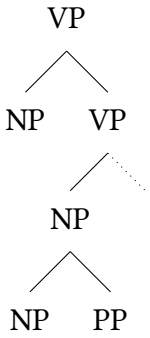
To account for this asymmetry Scheepers (1997) and Scheepers et al. (2000) assume that syntactic and thematic processing are (perhaps modularly) separated, which has the consequence that information about the thematic roles (linking) is not available until the clause-final wrap-up process. In a similar way, Schlesewsky & Bornkessel (2004) account for the above mentioned ERP results. They propose the *argument dependency model* (ADM), for which they assume two independent processing pathways: a syntactic pathway and a thematic pathway. Schlesewsky & Bornkessel (2004) argue that unambiguous case marking and animacy information feed into the thematic pathway, while in case of morphological ambi-

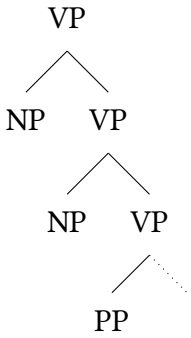
guity, linear order feeds into the syntactic pathway.[9] They conclude that both pathways operate independently of (potentially) available verb meaning. More explicitly, even if the lexical verb appears in the V2-position in German, there is no indication that the meaning of the verb influences the incremental interpretation process. The availability or operatibility of the two pathways is dependent on language-specific parameters: If a language does not provide enough morphological case information, the syntactic pathway will most likely dominate (e. g. English). In sum, both accounts attribute the absence of verb-specific processing influences until the clause-final position to a modular separation of syntactic and thematic processing. The V2-Reconstruction Hypothesis provides a principled explanation for this separation which otherwise has to be stipulated.

5.3.2 Attachment ambiguities

Further evidence in support of the V2-Reconstruction Hypothesis comes from attachment ambiguities of PP-adjuncts that can either modify the VP or the preceding NP. Konieczny et al. (1997) investigate the role of the lexical verb on structural attachment of NPs and PPs in German. They constructed experimental sentences in which the PP is either attached low, i. e. internal (as daugther node) to the previously processed phrase, as in (12a), or high-attached, i. e. external to the previously processed phrase, as in (12b).

(12) $[_{VP}$ NP + NP + PP]

a.


b.


In a series of three eye-tracking studies, Konieczny et al. (1997) investigate the attachment strategy and the potential garden-path effect that may result from erroneous attachment in German. They contrast clauses with the lexical verb in V2-position, as in (13a) and (13b), and clause with the lexical verb in clause-final position, as in (13c) and (13d). Evidently, if the lexical verb occurs in clause-final position, it cannot aid the parser in resolving the attachment problem. However, if the lexical verb precedes the arguments, the parser may be biased towards high or low attachment. Konieczny et al. (1997) tested two different verb classes, one class with a strong preference for PP-adjuncts, such as *beobachten* 'watch', and one class without a preference, such as *erblicken* 'catch sight of', to amplify the impact of the verb.

[9] Several authors also have stressed that in absence of case marking thematic ranking can be guided by animacy (contrasts) of the arguments in German (MacWhinney et al. 1984, Schlesewsky & Bornkessel 2004, Czypionka 2013).

(13) a. V2–VP-biased PP
Marion *beobachtete* [das Pferd] [mit dem neuen Fernglas].
Marion watched the horse with the new binoculars
'Marion watched the horse with the new binoculars.'

b. V2–NP-biased PP
Marion *beobachtete* [das Pferd mit dem weißen Fleck].
Marion watched the horse with the white patch
'Marion watched the horse with the white patch'

c. V-final–VP-biased PP
Ich habe gehört, dass Marion [das Pferd] [mit dem neuen Fernglas] *beobachtete*.
I have heard that Marion the horse with the new binoculars watched
'I have heard that Marion watched the horse with the new binoculars.'

d. V-final–NP-biased PP
Ich habe gehört, dass Marion [das Pferd mit dem weißen Fleck] *beobachtete*.
I have heard that Marion the horse with the white patch watched
'I have heard that Marion watched the horse with the white patch.'

(cf. Konieczny et al. 1997: 317)

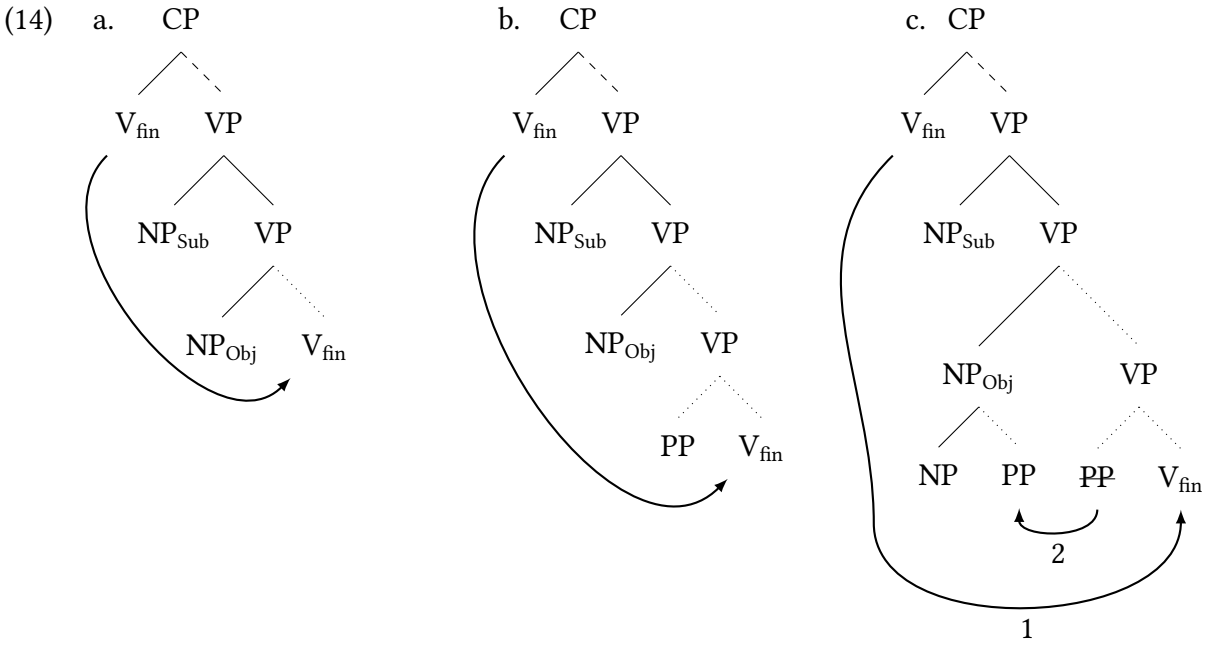
The results show essentially three effects: First, in V-final clauses, reading time measures are shorter for NP-biased PPs (*with the white patch*), which indicates that low attachment to the immediately preceding phrase seems to be the default. Second, in the V2 condition, on the other hand, reading times for VP-biased PPs (*with the new binoculars*) were shorter than for NP-biased PPs. Third, reading times on the PP-segment are longer in V2-clauses than in V-final clauses (Konieczny et al. 1997, Konieczny & Völker 2000). The first effect is straightforward: In V-final clauses, the parser adheres to the principle of Minimal Attachment[10] and initially attaches the PP to the last active node, i. e. the object NP.[11] After the attachment, the phrase will be interpreted. In case of a VP-biased PP (13c) the structure has to be reanalyzed such that the PP will be high-attached to the VP. This reanalysis is visible as prolonged reading times. What is the difference in V2-clauses? After encountering the object NP *das Pferd* 'the horse' the verb is reconstructed into the final position and the clause is complete for interpretation, as illustrated in (14a). In contrast to the V-final counterpart, the NP-node is already closed, because the structure is well-formed for interpretation. Now, when the parser encounters a PP, it adheres to late closure and tries to integrate this PP into the current clause. But it will do so in accordance with minimal attachment, i. e. with the structurally most parsimonious operation, i. e. high attachment to the VP, as shown in (14b). If this is the correct structure, as in (13a), the processing is complete. In case the high attachment is semantically ill-formed, as in (13b), the structure has to be revised again, as illustrated in (14c). This account perfectly explains the effect of the PP-attachment experiments. The V-final attachment strategy is the default strategy that prefers low attachment. Reading times on the PP are longer in V2-clauses because in these configurations the structure that

[10] See Section 4.2.1

[11] In contrast to Konieczny et al. (1997), I assume that a VP is postulated in a top down fashion. In V-final clauses, the V-head of this VP, however, is not or at least less active than the NP node because it has not been encountered yet.

is already pushed to interpretation has to be reopened to include the PP. Furthermore, low attachment in V2-clauses involves an additional repair process which results in even longer reading times.

(14)



Konieczny et al. (1997) provide a different interpretation of the results in a head-driven approach. They assume that phrases are only postulated if a head has been encountered. As a consequence, the PP is not attached to the VP in V-final clauses because the VP is not postulated until the final verb is reached. In V2-clauses the encounter of the finite verb leads to a postulation of a VP. The account of Konieczny et al. (1997) relies on the lexical subcategorization information. Hence, they must assume that the verb in the V2-position must be interpreted. An assumption that is unwarranted, as I have already argued and as will become more evident in the following.

5.3.3 Scope computing

Bott & Schlotterbeck (2015) investigate scope computation in German, more specifically the reconstruction of object quantifiers. As shown in (15), all their experimental sentences involved accusative-marked objects in clause-initial position. The accusative object has to be reconstructed. The unmarked base position of the object is located directly after the nominative subject and before the adverbial. The displaced object always contains a quantifier *jeden* 'each'. In (15a) the displaced object additionally contains a possesive pronoun *seiner* 'his' which is bound by the quantified subject *genau ein Lehrer* 'exactly one teacher'. This relation, in which the subject must take scope over the object, ensures the reconstruction of the object. Bott & Schlotterbeck (2015) contrast an *hypothesis of incremental scope computation*, which will determine the relative scope as soon as the quantifying expressions are encountered, with the *hypothesis of global interpretation*, which assumes that the determination of

relative scope requires also the interpretation of the predicate, i. e. scope is computed for (minimal) clauses. By placing the lexical verb either in second (15a–15d) or in clause-final position (15e), the predictions of the two hypotheses can be contrasted. Although both clause types in (15) are clearly main clauses with V2-order, i. e. the finite verb in second position, I will nevertheless follow Bott & Schlotterbeck (2015) and call clauses with the lexical verb in second position *V2 condition* and clauses with the lexical verb in clause-final position *V-final condition*.

(15) a. QQ+BIND
Jeden seiner Schüler lobte genau ein Lehrer voller Wohlwollen.
[Each.Q of his pupils]ACC praised [exactly.Q one teacher]NOM full of goodwill.

b. QQ−BIND
Jeden dieser Schüler lobte genau ein Lehrer voller Wohlwollen.
[Each.Q of these pupils]ACC praised [exactly.Q one teacher]NOM full of goodwill.

c. QDEF+BIND
Jeden seiner Schüler lobte der neue Lehrer voller Wohlwollen.
[Each.Q of his pupils]ACC praised [the.DEF new teacher]NOM full of goodwill.

d. QDEF−BIND
Jeden dieser Schüler lobte der neue Lehrer voller Wohlwollen.
[Each.Q of these pupils]ACC praised [the.DEF new teacher]NOM full of goodwill.

e. V-final scheme
Jeden … Schüler hat … Lehrer voller Wohlwollen gelobt.
[Each pupils]ACC has [teacher]NOM full of goodwill praised.

(Bott & Schlotterbeck 2015: 64–65)

For the self-paced reading study, Bott & Schlotterbeck (2015) report a main effect with longer reading times for V2-clauses than for V-final clauses. The first spillover region *voller* 'full of' revealed a scope inversion effect only for V2-clauses, i. e. the condition in which the dislocated pronoun is bound by the subject (15a) elicited longer reading times only in the V2 condition. Additionally, at the clause-final region, a strong effect of DP-type turned up with longer reading times for the doubly quantified clauses (QQ). As can seen in Figure 5.1, the effect seems to depend on the verb, because it does appear before the verb in the V-final condition. This indicates that the second spillover region is also the point at which the verb receives its full interpretation in the V2 condition. Bott & Schlotterbeck (2015) interpret this simply as a spillover effect. Under the V2-Reconstruction Hypothesis, however, this effect receives a principled explanation. After encountering the second argument, the processor invariably reconstructs the fronted object and the finite verb. In the V2 condition, the sentence is already complete and will be interpreted. In the V-final condition, however, the interpretation is delayed until the encounter of the clause-final verb.

For a parallel eye-tracking experiment, Bott & Schlotterbeck (2015) report increased reading times in late measures (go-past times and first-pass regression ratios) for both the doubly quantified condition and scope inversion. Both main effects are detectable only at the clause-final element, irrespective of the position of the lexical verb. Additionally, Bott & Schlotterbeck (2015) report longer second-pass times for the two arguments and the V2-position

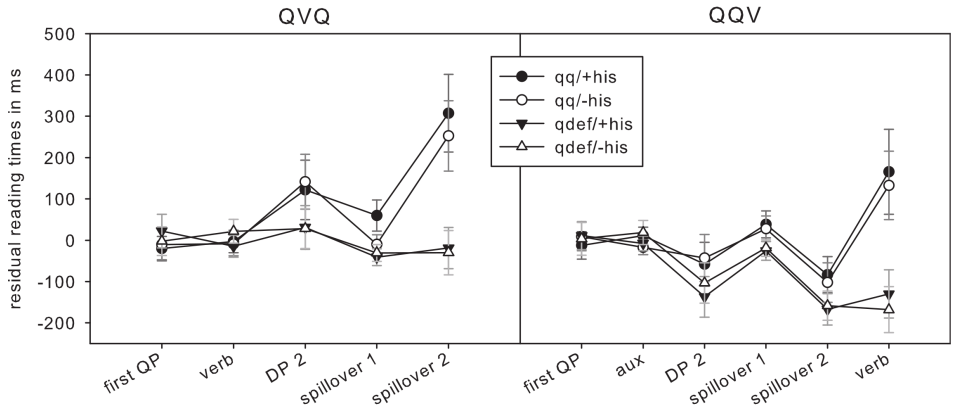


Figure 5.1: Reading times of the SPR-experiment in Bott & Schlotterbeck (2015: 68)

within the scope inversion condition. This indicates that in eye-tracking readers computed scope rather late, after reading the sentence.

In sum, the experiments on scope reconstruction revealed the same pattern as the processing of thematic structure. Processing effects that are dependent on the meaning of the verb show up at the end of the sentence, whether the verb is in V2 or in V-final position. This indicates that, in German, the interpretation of the verb is delayed until the base position of the verb (right edge of the VP).

5.3.4 Processing of the verb: Anticipation and integration

Now, I take a more direct look at the processing of the verb. Weyerts et al. (2002) report results from self-paced reading and ERP experiments which they interpret as providing evidence for the claim that German speakers process finite verbs in second position more easily than finite verbs in clause-final position. In light of the theoretical discussion above, these results seem quite surprising. A detailed inspection will show that these claims are unsubstantiated.

Weyerts et al. (2002) contrast coordinated matrix clauses with embedded clauses, as in (16).

(16) a. Hans facht das Lagerfeuer an, und Paul ⟨öffnet⟩ die Dosen ⟨*öffnet⟩.
Hans fans the camp fire PART and Paul opens the cans opens
'Hans fans the camp fire and Paul opens the cans.'

b. Die Leiterin des Kochkurses bestimmt, dass Erika ⟨*öffnet⟩ die Dosen ⟨öffnet⟩.
the director of the cookery course decides that Erika opens the cans opens
'The director of the cookery course decides that Heather the cans opens.'

(Weyerts et al. 2002: 219)

For the self-paced reading experiment, they report longer reading times for the object-verb region only within the coordinated main clauses with ungrammatical V-final order. Weyerts et al. (2002) interpret the absence of an ungrammaticality effect for the embedded V2-clause condition as evidence for a general processing preference of early finite verbs. It is, however, very likely that the absence of prolonged reading times is caused by syntactic priming,

because all target clauses follow a main clause with V2-order. Consequently, we would expect that processing V2-order in the second clause is facilitated even if it is ungrammatical, whereas no facilitation is provided for V-final clauses in coordinated main clauses. Syntactic priming (parallel processing) has been shown to reduce reading times (Frazier et al. 1984, Weskott 2003).

For the ERP experiments with similar stimuli, Weyerts et al. (2002) report an early anterior negativity in OV clauses in contrast to VO clauses, which they interpret as an increased processing load for verb-final structures. However, Schlesewsky et al. (2002) argue that this effect is, in fact, an early *positivity* that stems from the comparison of a noun, i. e. the object of the verb-final clause, with the verb in the VO-clause. Schlesewsky et al. (2002) note that such word class differences that match in topography and latency have been reported for studies in English. Similar results from ERP responses to a lexical decision task that contrast nouns and verbs in German are also reported by Pulvermüller et al. (1999). The critical reexamination additionally explains why, in the self-paced reading study, the word order interacted with ungrammaticality (syntactic priming) whereas the ERP responses were independent of the grammaticality (word class difference). In sum, despite the claim that finite verbs are easier to process in an early clause position, the discussion of Weyerts et al. (2002) does not shed any light on the actual processing of the finite verb in the German clause, i. e. when and in which depth the finite verb is interpreted and whether or how it influences processing of other clausal constituents. For example, under the V2-Reconstruction Hypothesis, it is assumed that the first encounter of the displaced verb only involves a shallow parse. Hence, we would predict faster processing in comparison to clause-final verbs, but obviously we do not want to compare these instances. The discussion of reanalysis effects above have proven that clause-final verbs trigger several processing routines that relate to the preceding argument structure. Hence, a simple comparison between the two positions is unjustified.

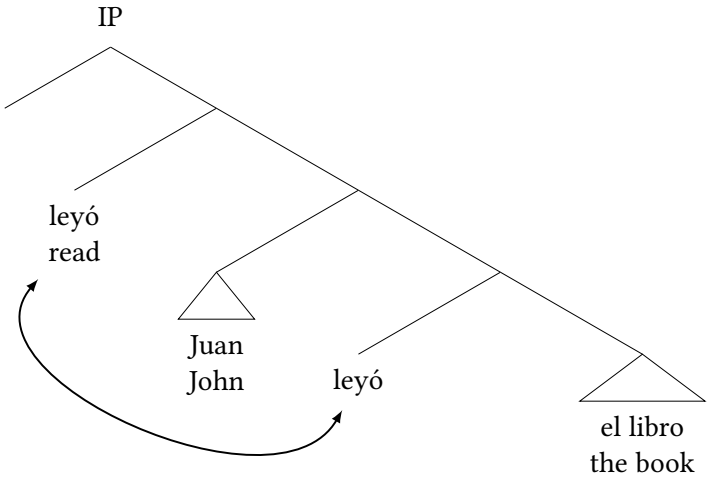
Furthermore, the claim that clause-final verbs are generally harder to process is at best an oversimplification. Precisely for German, it has been argued that processing load varies as a function of preverbal material. Konieczny (2000) reports results from a self-paced reading study that became known as the *anti-locality effect*. In German verb-final clauses, reading times on the verb turned out to be shorter with increasing length of preverbal material. Konieczny (2000) takes this as an indication of a type reduction operation: The more elements precede the clause-final verb, the faster it will be processed. This effect is more pronounced for predictable elements, such as arguments, but also detectable for adjuncts (Konieczny 2000, Konieczny & Döring 2003, Levy & Keller 2013). The assumption of the *anticipation hypothesis*, as it was called later, is that the information of the arguments help to narrow down the verb to come and make it more expected. This essentially leads to the shorter processing time on the verb.

But are we bound to conclude that verbs in second position exhibit longer reading times than their clause-final correspondents, because they cannot be anticipated? On the contrary. Scheepers (1997) reports that verbs in V2-position are read faster than their corresponding counterparts in clause-final position. He attributes this to an opaque clause-final wrap-up process. Although I am not denying that clause-final wrap-up process may play a role here, I suggest that this effect may mask verb-specific processes. Under the assumption that the verb is not fully interpreted in the V2-position, it seems plausible that the processing time at

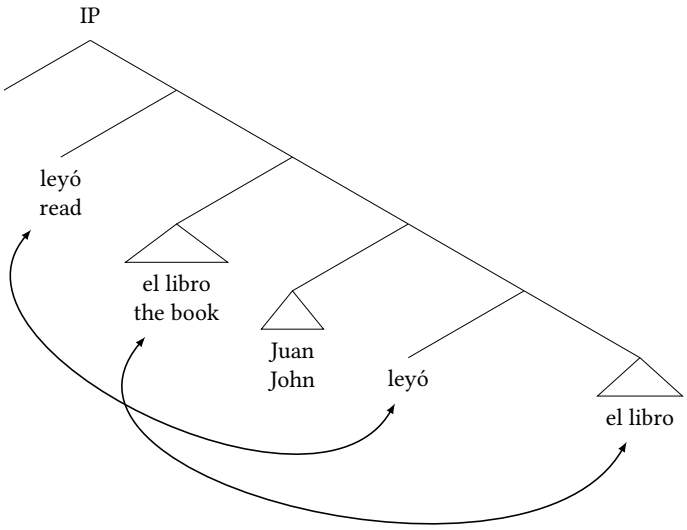
this early point is rather short. A clause-final verb, on the other hand, can immediately integrate all its arguments and modifiers (except for complement clauses), and be immediately interpreted. Therefore processing of clause-final verbs is predicted to show longer processing time.

Finally, I present direct evidence for the fundamental assumption that verbal heads do reconstruct in a filler-gap-like fashion. Love & Swinney (1998) cite a cross-modal lexical priming study by Basilico et al. (1995)[12] that investigated reactivation priming effects for verbs in Spanish verb-initial structures, VSO and VOS. The rationale goes as follows: Spanish has a basic SVO structure. Both verb-initial orders are derived by fronting the pre-subject material, as shown in (17). Consequently we expect that the verb is reconstructed into a position between the subject and the object in the VSO structure in (17a), but not in the VOS structure in (17b).

(17) a. VSO



b. VOS



[12]Many thanks to Inés Antón-Méndez for rummaging up the paper and sharing it.

(18) a. VSO
Vieron$_1$ [tus vecinos, los de la casa rosa] ## t_1 [a todos sus hijos,
see your neighbors them from the house pink to all their sons
hijas y nietos] [el fin de semana pasado]?
daughters and grand children the end of week past
'Did your neighbors from the pink house see all their sons daughters and grand children last weekend?'

b. VOS
El fin de semana pasado vieron$_1$ a todos sus hijos, hijas y nietos
[the end of week past] see [to all their sons daughters and grand children]
tus vecinos, los de la casa rosa t_1?
[your neighbors them from the house pink]
'Last weekend, did you see all their sons daughters and grand children your neighbors from the pink house?'

c. prime position: ##, related prime: *mirar* 'look', unrelated prime: *lavar* 'wash'

Basilico et al. (1995) report trace reactivation effects of the verb between the subject and the object position (##) in VSO clauses in (18a) but none in the VOS structures in (18b). These results therefore provide positive evidence that also verbs, i. e. syntactic heads, may enter filler-gap dependencies in a similar way as it is widely accepted for dislocated phrasal constituents.

5.4 Chapter summary

In sum, the review of the experimental literature revealed that, clauses in which the lexical verb occurs in the V2-position do not reveal processing effects that are indicative of predictive parsing, although in German predicates show considerable variation with respect to number, case-marking, order, and syntactic category of the selected arguments. To the contrary, thematic effects are detectable at the clause-final position, irrespective of the surface position of the verb. Comparable temporal signatures are likewise found in experiments investigating scope reconstructions that require access to the verb meaning. The experimental results from attachment ambiguities also match the prediction that in V-final clauses, phrases remain open as attachment sites but in V2-clauses argument phrases are closed as early as possible. Additionally, I presented evidence from Spanish which indicates that verbs may enter filler-gap dependencies and hence support the view that they are reactivated at their base position. Taken together, the literature review provided empirical support for the V2-Reconstruction Hypothesis.

6 Experimental investigations of the V2-Reconstruction Hypothesis

In this chapter, I present four self-paced reading experiments on German that test the predictions of the V2-Reconstruction Hypothesis. The first two experiments make use of a verbal NPI to identify the temporal locus of interpretation. In an environment that does not license NPIs, the interpretation of such an NPI will lead to ungrammaticality which will result in increased reading times. The second experiment, in Section 6.2 is a follow-up study which eliminates potential confounds in the first experiment's design. The third experiment in Section 6.3 makes use of two verb groups that differ in their selectional requirements of infinitives. Violation of the selectional requirements will result in ungrammaticality which indicates the point at which these requirements are evaluated. The fourth experiment in Section 6.4 investigates argument order preferences dependent on the type of verb in the V2-position. The results of the first three experiments confirm the predictions of the V2-Reconstruction Hypothesis. The results of the fourth experiment are compatible with the V2-Reconstruction Hypothesis. Due to the fact that the last experiment does not involve a sharp contrast in grammaticality but only preferences, the results are less clear-cut and the interpretation is less evident.

6.1 Experiment 2: Reconstruction of the verbal NPI *brauchen* (self-paced reading)

In Section 3.3.2, I argued that the licensing of verbal NPIs in German has to be evaluated in their base position. This prediction is put to the test in an experimental setting. First, I summarize findings on correlates of (failed) NPI-licensing that were reported in the literature. Subsequently, I explicate how the rationale of the experiment makes use of those processing effects to evaluate the predictions of the V2-Reconstruction Hypothesis.

Previous research on processing NPIs showed that participants are sensitive to specific licensing condition, as predicted by grammatical accounts. In rating experiments, sentences which lack a licensor, as in (1b) receive comparably low acceptability ratings as do sentences in which the licensor is not in a c-command relation with the NPI, as in (1c) (Saddy et al. 2004, Xiang et al. 2013, Parker & Phillips 2016, Yanilmaz & Drury 2018).

(1) a. Kein$_{\text{LIC}}$ Mann, [der einen Bart hatte,] war jemals$_{\text{NPI}}$ glücklich.
no man who a beard had was ever happy
'No man who had a beard was ever happy.'

b. *Ein Mann, [der einen Bart hatte,] war jemals$_{NPI}$ glücklich.
a man who a beard had was ever happy
'*A man who had a beard was ever happy.'

c. *Ein Mann, [der [keinen Bart]$_{LIC}$ hatte,] war jemals$_{NPI}$ glücklich.
a man who no beard had was ever happy
'*A man who had no beard was ever happy.'

(Drenhaus et al. 2005: 146)

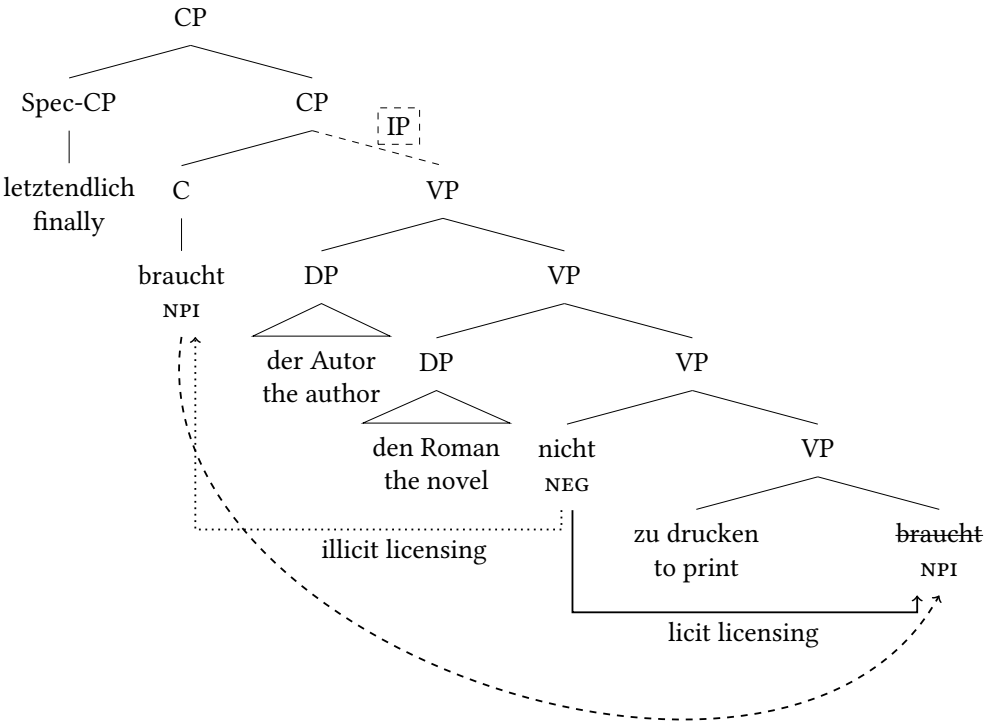
In on-line processing, participants showed immediate responses to licensing violations directly at the NPI (e. g. *jemals*). Violations yield prolonged reading times (RTs) for roughly three segments (Vasishth et al. 2008, Xiang et al. 2013, Parker & Phillips 2016). In ERP-experiments, NPI-licensing violations triggered N400 effects (Saddy et al. 2004, Drenhaus et al. 2005, 2007, Yanilmaz & Drury 2018) and P600 effects (Drenhaus et al. 2005, 2006, Xiang et al. 2009, Yanilmaz & Drury 2018). These immediate responses, which seems to be detectable robustly across languages, indicate that participants evaluate the licensing of an NPI as soon as the lexical item is interpreted. However, illusory licensors, such as in (1c) lead to significant deviations: more errors and longer response latencies in speeded acceptability judgments (Drenhaus et al. 2005: 148–149), delayed effects of reading time increase (Parker & Phillips 2016: 326–327), and a smaller N400 effect (Drenhaus et al. 2005: 155–157).

6.1.1 Rationale

Recall from the discussion in Section 3.3.2 that, in cases like (2a), the NPI can only be licensed in its base position and not in the surface position as illustrated in (2b). In order to check the licensing requirements of *brauchen* 'need to', it has to be reconstructed into its base position.

(2) a. Letztendlich *braucht*$_{NPI}$ der Autor den Roman nicht$_{LIC}$ zu drucken ~~braucht~~.
'Finally, the author doesn't have to print the novel.'

b.



If the verbal NPI appears in the V2-position, it precedes its licensor. Nevertheless, no violation of NPI-licensing becomes apparent. According to the V2-Reconstruction Hypothesis, this is unproblematic because the position in which the V2-verb will be interpreted is its base position. Consequently, we expect that the above mentioned processing effects indicating NPI-licensing failure appear only in the base position of the NPI-verb, namely after the infinitive *zu drucken* 'to print'. I assume furthermore that the processor has a built-in preference to resolve such a pending dependency between the V2- and the base position as early as possible. For filler-gap dependencies (especially *wh*-movement), this has been thoroughly demonstrated and is widely accepted as the *active filler hypothesis* (see Frazier & Clifton 1989: 95). It builds on experimental evidence which indicates that the processor integrates the filler (displaced element) anticipatorily, i. e. before encountering explicit cues for the formation of the actual dependency. If the next incoming segment reveals that the position that was connected to the filler is filled by a surface element, a reanalysis process takes place. This reanalysis is reflected by increased processing load known as the *filled-gap effect* (Stowe 1986). Following this insight, the target sentences were extensions of sentences like (2), which provided for two possible positions into which the NPI *brauchen* could reconstruct, as illustrated in (3).[1] Both positions, #1 in (3a) and #2 in (3b) are licit positions for the NPI because they are verbal positions that are locally c-commanded by the negator *nicht*.

(3) a. Letztendlich *braucht* der Autor den Roman *nicht* zu drucken #1 ~~braucht~~ …
finally needs the author the novel not to print

b. Letztendlich *braucht* der Autor den Roman zu drucken #1 unter Umständen *nicht*
finally needs the author the novel to print eventually not
zu verbieten #2 ~~braucht~~ …
to forbid

If participants insert *brauchen* automatically in #1 in (3b), as expected under filler-gap parsing, the result is a temporarily ungrammatical structure.[2] The licensing conditions of the NPI are violated as seen in (4a) below. To measure such a potential effect we constructed control sentences, in which the NPI-verb *brauchen* was replaced by *beschließen* 'to decide', which appears in the same syntactic environment, selects *zu*-infinitives and constitutes a plausible replacement in the relevant contexts. Crucially, however, *beschließen* is not an NPI and therefore yields a grammatical structure if it is inserted in #1, as illustrated by the contrast between (4a) and (4b). On the other hand, *beschließen* is fully compatible with negation. The difference between the two verbs can therefore be paraphrased as follows: *brauchen* is ungrammatical in positions which are not in the scope of a negation whereas *beschließen* is grammatical whether in the scope of negation or not.

(4) a. * Letztendlich *braucht* der Autor den Roman zu drucken #1 …
finally needs the author the novel to print

[1] In the non-NPI-reading *brauchen* could also reconstruct after *Roman* yielding *The author needs the novel.* Searching for effects related to this reconstruction, which is, however, not dependent on a specific licensing configuration, would require a different experimental set-up.

[2] To be sure, there is no reason for the parser to hypothesize more than the minimally converging structure; this excludes the expectation of a converging structure that leads to the successful gap filling at #2.

b. Letztendlich *beschließt* der Autor den Roman zu drucken #1 …
finally decides the author the novel to print

6.1.2 Method

Materials

The material consisted of 32 experimental items interspersed with 35 fillers (20 from a different experiment) resulting in 67 stimuli per participant. The target sentences were preceded by a context sentence, as in (5), which introduced the agents and the scene of the item in order to render the target sentences more plausible and to reduce the number of accommodations that have to be made during the reading of the target sentence. The context sentences were not matched for length. The target sentences varied in a $2 \times 2 \times 2$ design with the factors MATRIX.VERB, ILLUSORY.NEG, and LICENSING.NEG, which will be explicated hereafter. The finite matrix verb was either the modal NPI-verb *brauchen* 'need to', as in (6) or the polarity-neutral verb *beschließen* 'decide', as in (7). The factorial combination of the two negation positions results in four different negation patterns, which are first illustrated for the +NPI condition in (6): double negation (6a), only the late negation (6b), only the early negation (6c), and no negation at all (6d). Actually, only the second negation is relevant for the licensing of the NPI *brauchen* in the final structure, hence the term *licensing negation*. The first negation only appears to be relevant for the licensing of the NPI in the incomplete initial substring. In the final structure, however, the first negation is irrelevant for the licensing configuration because it does not c-command the head of the matrix clause VP/IP, hence the term *illusory negation*. Therefore the −LICENSOR.NEG conditions in (6c) and (6d) are finally ungrammatical which, however, does not affect measures at earlier points. The same negation patterns occur also with the −NPI verb in (7) with the difference that all four variants are grammatical.

The finite verb was followed by a subject DP and an object DP which were definite masculine singular and therefore unambiguously case marked. Between the two infinitives, i. e. following the first reconstruction site #1, a 2-word adverbial phrase such as *unter Umständen* 'possibly' was inserted to obtain a spillover region providing measure points for potential effects of the reconstruction of the finite verb. Similarly the second infinitive, i. e. the second reconstruction site #2, was followed by a 6-word infinitival clause introduced by the complementizer *um* 'for'. The potential reconstruction sites (#1 and #2) are indicated in the materials below only for illustrational purposes and to facilitate the comparison with the examples of the rationale-section above. These marking were not visible in the materials as they were presented to the participants. Half of the items were followed by a yes/no-comprehension question, as in (8), to evaluate whether participants paid attention to the task. All experimental items are given in the appendix.

(5) CONTEXT:
Ein Autor hat wegen seines neuen Romans Ärger mit seinem Verlag. Er bespricht mit seinem Anwalt, ob er den Druck untersagen soll.

'An author has trouble with his publisher because of his new novel. He talks to his lawyer whether he should forbid the printing.'

(6) a. +NPI +ILLUSORY.NEG +LICENSOR.NEG
Letztendlich *braucht* der Autor den Roman *nicht* zu drucken #1 unter Umständen
finally NPI the author the novel not to print under circumstances
nicht zu verbieten #2, um das mediale Interesse zu wecken.
not to forbid for the medial interest to arouse
'Thus the author doesn't have to forbid to not print the novel this time in order to arouse the attention of the media.'

b. +NPI −ILLUSORY.NEG +LICENSOR.NEG
Letztendlich *braucht* der Autor den Roman zu drucken #1 unter Umständen
finally NPI the author the novel to print under circumstances
nicht zu verbieten #2, um das mediale Interesse zu wecken.
not to forbid for the medial interest to arouse
'Thus the author doesn't have to forbid to print the novel this time in order to arouse the attention of the media.'

c. +NPI +ILLUSORY.NEG −LICENSOR.NEG
*Letztendlich *braucht* der Autor den Roman *nicht* zu drucken #1 unter Umständen
finally NPI the author the novel not to print under circumstances
zu verbieten #2, um das mediale Interesse zu wecken.
to forbid for the medial interest to arouse

d. +NPI −ILLUSORY.NEG −LICENSOR.NEG
*Letztendlich *braucht* der Autor den Roman zu drucken #1 unter Umständen
finally NPI the author the novel to print under circumstances
zu verbieten #2, um das mediale Interesse zu wecken.
to forbid for the medial interest to arouse

(7) a. −NPI +ILLUSORY.NEG +LICENSOR.NEG
Letztendlich *beschließt* der Autor den Roman *nicht* zu drucken #1 unter Umständen
finally decides the author the novel not to print under circumstances
nicht zu verbieten #2, um das mediale Interesse zu wecken.
not to forbid for the medial interest to arouse
'Thus the author decides not to forbid to not print the novel this time in order to arouse the attention of the media.'

b. −NPI −ILLUSORY.NEG +LICENSOR.NEG
Letztendlich *beschließt* der Autor den Roman zu drucken #1 unter Umständen *nicht* zu verbieten #2, um das mediale Interesse zu wecken.
'Thus the author decides not to forbid to print the novel this time in order to arouse the attention of the media.'

c. −NPI +ILLUSORY.NEG −LICENSOR.NEG
Letztendlich *beschließt* der Autor den Roman *nicht* zu drucken #1 unter Umständen zu verbieten #2, um das mediale Interesse zu wecken.
'Thus the author decides to forbid to not print the novel this time in order to arouse the attention of the media.'

d. −NPI −ILLUSORY.NEG −LICENSOR.NEG
Letztendlich *beschließt* der Autor den Roman zu drucken #1 unter Umständen zu verbieten #2, um das mediale Interesse zu wecken.
'Thus the author decides to forbid to print the novel this time in order to arouse the attention of the media.'

(8) COMPREHENSION QUESTION:
Hat der Autor mit seinem Anwalt gesprochen?
'Did the author talk to his lawyer'
correct answer = *Ja* 'Yes' wrong answer = *Nein* 'No'

Predictions

The predictions are as follows: Because reconstruction of the finite verb is an automatized process, the finite verb will always be reconstructed into the earliest syntactically possible position. Consequently, longer reading times are predicted from #1 onwards, i. e. *drucken*, in the +NPI, −ILLUSORY.NEG-condition, in which an NPI is reconstructed into and interpreted in a position where it is not licensed. The same effect is predicted to appear in the extended sentence at #2, i. e. *verbieten*, except that longer reading times are expected in the +NPI, −LICENSOR.NEG-condition. Here again, the NPI is reconstructed into a position in which it is not licensed. According to previous findings, I expect that reading times at #2 may be influenced by the presence of an illusory licensor, i. e. a potentially licensing element which precedes the NPI, but is not in a structurally licit position to license the NPI. Additionally, prolonged reading times are also expected in conditions with two negations due to the increased complexity in interpretation. However, double negation should affect the +NPI and the −NPI condition equally.

Participants

We tested 41 participants (age 18–34 years, mean 23 year; 11 male), all students of the University of Konstanz, self-declared native speakers of German, and right-handed. Participants received a reimbursement of 5 € for participation.

Procedure

The experiment was carried out in a centered self-paced reading paradigm (Just et al. 1982) in which the segments were presented non-cumulatively in a stationary window. This mode of presentation provided no visual cues that would allow the participants to predict the length of the sentences. For each item, the participants saw the context sentences and the target sentence presented in a word-per-word fashion in the middle of the screen. Participant moved through the segments at their own pace by pressing the space bar. In approximately half of the stimuli a yes-no comprehension question was displayed after the final segment. Participants had to choose the correct answer by pressing the 'f' or 'j' key on a German keyboard. After each response the participants saw a feedback message whether their response

was correct or not. Participants were instructed to read the sentences and to answer the questions as fast as possible in order to give correct responses.

The procedure was set up with the experiment software package *Linger*[3] and run on a Windows PC in a psycholinguistics lab. The experimental stimuli were randomized according to the Latin square design, such that each participant saw each of the 32 items in exactly one of the 8 experimental conditions. The total list of stimuli (experimental items plus fillers) were automatically randomized by the experiment software. Experiments took approximately 20 minutes.

Data analysis

Prior to the analysis, all data points with reading times larger than 2 seconds (n=48) have been excluded (0.2 % of the data). The data analysis was carried out by use of the statistical software package R (R Core Team 2015). I used linear mixed-effects models of the lme4 package (Bates et al. 2013) to analyze the log-transformed reading times.[4] Following arguments in Barr et al. (2013) and Bates et al. (2015), I fitted maximal justified random-effect structures for the LME-models. I performed a model criticism as recommended in Baayen & Milin (2010) by excluding absolute standardized residuals exceeding 2.5 standard deviations. I report the results of the criticized model, taking effects as significant if the respective t-value exceeds an absolute value of 2. I will report the fixed-effect coefficients of all analysis that showed significant effects below by indicating the exact model specifications.

The analysis of the reading times proceeded in two steps: The initial sequence of the target sentences including the adverbial *unter Umständen* was identical for the ±LICENSOR.NEG conditions. These two conditions are aggregated for the analysis of this region, resulting in a 2×2 analysis. Only for the remaining segments, a full $2 \times 2 \times 2$ analysis including all 8 experimental condition were applied.

The participants' accuracy in response to the comprehension questions ranged from 71–100 % (mean 87 %). No participant was excluded from the analysis.

6.1.3 Results

First infinitive + adverb: The reading time results for the first region of interest are presented in Figure 6.1. No effects could be detected at the negation and the infinitive particle *zu* 'to'. At the following three segments, the infinitive *drucken* 'print', the first adverb segment *unter* 'under', and the second adverb segment *Umständen* 'circumstances', the 2×2 analysis revealed an interaction of both factors MATRIX.VERB and +ILLUSORY.NEG ($t = -3.2511$, $t = -2.0309$, and $t = -1.6003$ respectively) indicating that the +NPI −ILLUSORY.NEG condition shows longer reading times than all other conditions. Whereas the significance increases after model criticism for the first two segments, the t-value of the interaction term of the second adverb segment drops below significance. However, the direct comparison between the −NPI −ILLUSORY.NEG and the +NPI −ILLUSORY.NEG remains significant for all three segments

[3] Written by Doug Rhode available at http://tedlab.mit.edu/~dr/Linger/

[4] Reading times were log-transformed to achieve a distribution of the data points that resemble a normal distribution.

($t = 2.8084$, $t = 3.2666$, and $t = 2.5077$ respectively). Additionally, an analysis of the summed reading times for this 3-segment region also revealed a significant direct comparison ($t = 3.6767$) and a significant interaction ($t = -3.0239$). The exact model outputs of these analyses are given in Tables 6.1 to 6.4.

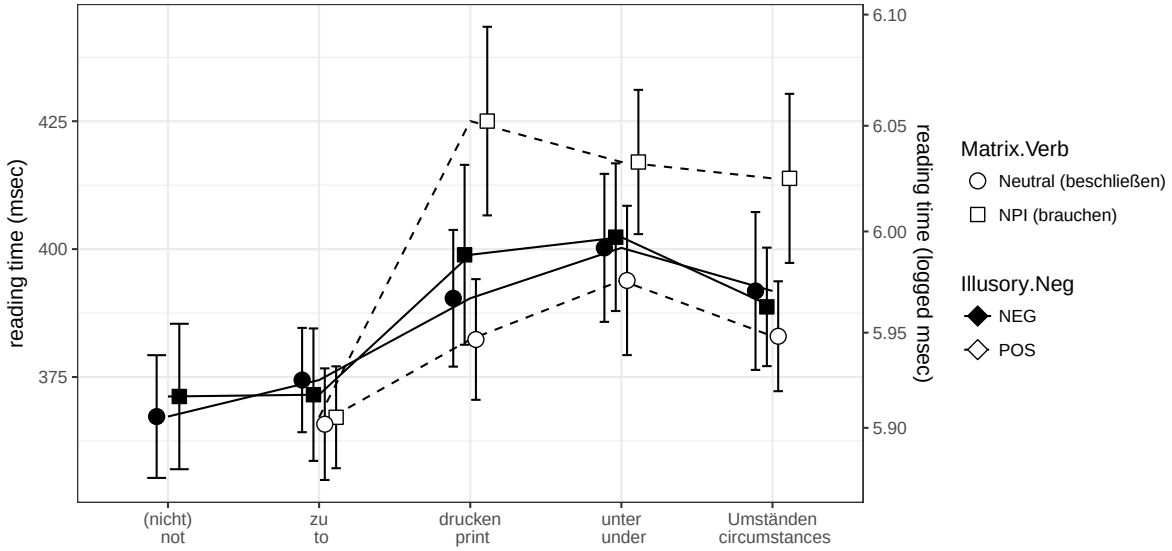


Figure 6.1: Mean reading times for the first infinitive + adverb region of Experiment 2 (95 % CI)

The reading times for the second region, i. e. the segments following the LICENSING.NEG are displayed in Figure 6.2. The results can be divided into two subregions, the second infinitive and the spillover region.

Second infinitive: No effects could be detected on the second negation. On the particle of the second infinitive *zu*, which followed directly after the LICENSING.NEG, the analysis revealed contrasts for both negations, the LICENSING.NEG ($t = -2.3089$) and the ILLUSORY.NEG ($t = -2.6988$), signaling that presence of the negations yields longer reading times. Additionally, the model revealed an interaction of the MATRIX.VERB and the ILLUSORY.NEG ($t = 2.0343$) which indicates that, for the –NPI matrix verb, both negations increase reading times whereas for the +NPI, only the directly preceding LICENSING.NEG affects reading times and the earlier ILLUSORY.NEG has no significant impact on the reading times. On the infinitive *verbieten* 'forbid' the model yielded only a contrast of LICENSING.NEG ($t = -2.3346$) with longer reading times for a present negation. The analysis of the aggregated reading times of the particle and the infinitive *zu verbieten* 'to forbid' revealed a significant contrast of LICENSING.NEG ($t = -2.9335$) and a strong tendency of ILLUSORY.NEG ($t = -1.9718$) for the –NPI verb. The exact model outputs for this subregion are given in Tables 6.5 to 6.7.

Spillover region: No effect could be detected on the first two segments of the spillover region, the complementizer *um* and the determiner *das*. On the adjective of the spillover region *mediale* 'medial', the analysis revealed an effect of MATRIX.VERB ($t = -2.6226$), LICENSING.NEG ($t = -2.0702$), and ILLUSORY.NEG ($t = -2.5632$) as well as an interaction of

MATRIX.VERB and ILLUSORY.NEG ($t = 2.1532$). Essentially, this indicates that the ungrammatical condition in which the +NPI verb is preceded only by the ILLUSORY.NEG, yields longer reading times than all other conditions. On the noun *Interesse* the model revealed an effect of LICENSING.NEG ($t = 2.1943$) for the −NPI verbs with longer reading times for the negation present. On the following infinitive particle *zu*, the model revealed a 3-way interaction of MATRIX.VERB, LICENSING.NEG, and ILLUSORY.NEG ($t = 2.1173$), indicating a significant contrast between the non-negated −NPI condition with shortest reading times and the doubly-negated +NPI condition with longest reading times. On the final segment, i. e. the infinitive *wecken*, the model revealed several significant contrasts which indicate that the non-negated −NPI condition shows shorter reading times than all other condition, as clearly visible in Figure 6.2. The analysis of the aggregated reading times of the three final segments *Interesse zu wecken* yielded the same combination of contrasts, which have been found on the final segment, namely that the non-negated −NPI showed shorter reading times than all other conditions. The exact model outputs for this region are given in Tables 6.8 to 6.12.

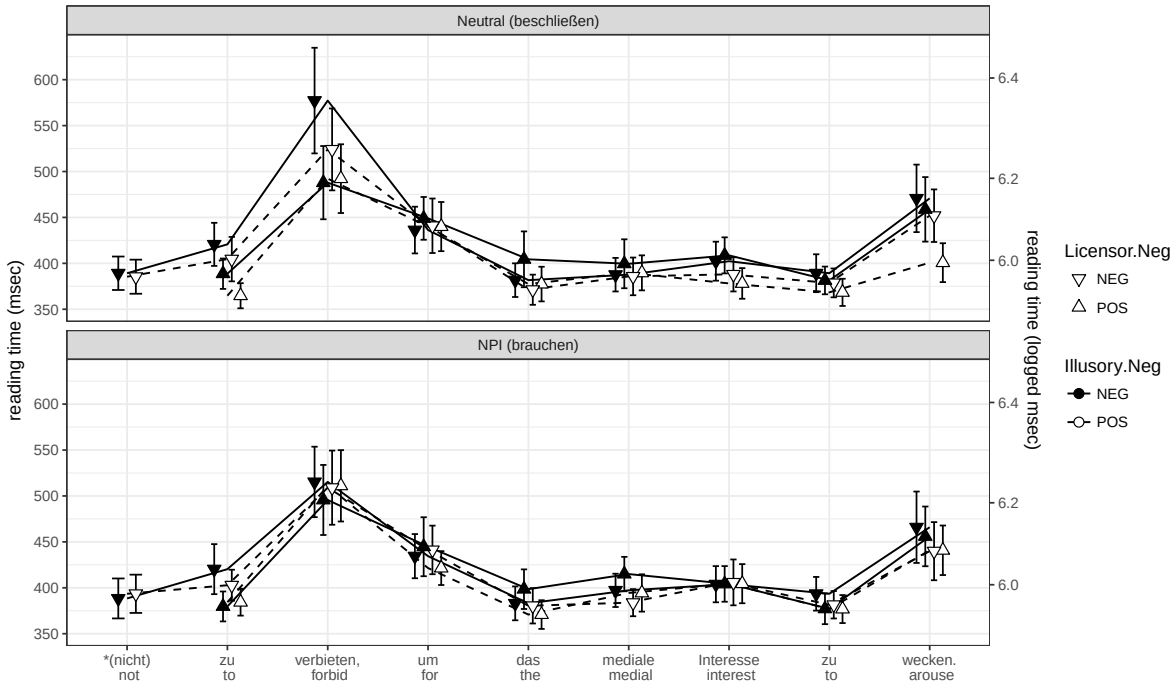


Figure 6.2: Mean reading times for the high VP + spillover region of Experiment 2 (95 % CI)

6.1.4 Discussion

In line with the predictions of the V2-Reconstruction Hypothesis, the results show increased reading times for non-licensed NPI from the first infinitive *drucken* onwards. As illustrated for the materials in (6) and (7), this is the segment which directly precedes the first reconstruction site. This indicates that, after integrating *drucken* into the parse, the finite verb will

be automatically reconstructed and interpreted. If the finite verb is the NPI *brauchen*, it must be properly licensed at this point. In the +NPI −ILLUSORY.NEG condition, no such licensor is present. This temporary licensing failure results in prolonged reading times which extend to the two following segments, showing the same effect profile with respect to polarity and temporal extension as in previous studies of non-licensed NPIs in surface position (e. g. Parker & Phillips 2016).

At the second infinitive region *zu verbieten*, the result did not indicate an immediate effect of NPI-licensing in contrast to the predictions above. For both verb types, the presence of an immediately preceding LICENSING.NEG led to longer reading times. However, at the particle of the second infinitive *zu*, a statistical interaction turned up which indicates that NPI licensing does affect reading times at this point: For the −NPI verb *beschließen* reading times are shortest in the condition without negation, and the presence of each negation increases reading times in an additive fashion. For the +NPI verbs only the directly preceding negation, the LICENSING.NEG, increased reading times. The non-negated condition, being ungrammatical, shows comparably longer reading times, i. e. as long as all singly negated conditions.

In the spillover region, the analysis revealed a correlate of NPI-licensing failure. At the adjective *mediale*, the model detected significantly longer reading times for the +NPI verb that was preceded only by the illusory negation (+NPI, +ILLUSORY.NEG, −LICENSOR.NEG). In contrast to the predictions, this effect was very local and affected only one of two ungrammatical conditions. I assume that this effect reflects a delayed evaluation of the licensing conditions. Further, I assume that the delay is due to the complexity of the sentence with two embedded infinitives, which impedes the evaluation of the NPI-licensing. I suspect that the −ILLUSORY.NEG −LICENSOR.NEG condition, in which no possible NPI-licensor is present, is so demanding that the processor *gives up* and switches to a more shallow parsing mode which explains why no prolonged reading times corresponding to the ungrammaticality are observable at the spillover region. Interestingly, at the three clause-final segments, the results show a distance effect of negation. The non-negated −NPI verb condition showed the shortest reading times of all conditions, which indicate that simple and double negation does impact processing at the clause-final region. The non-negated +NPI condition, however, patterns with negated condition, due to its non-licensed NPI.

One weak point of the material is, that in the first region, where we found the predicted interaction, the distance between the position of the negation and the reconstruction site of the NPI is very small. An alternative explanation can therefore be that the prolonged reading times in the +NPI, −ILLUSORY.NEG condition is a consequence of the missing negation without resorting to a reconstruction analysis.[5] If the NPI is interpreted in the C-domain, a negation is expected. If this expectation is not satisfied, the reading times increase on the elements following the canonical position of the negation. In the next section, I report the results of a follow-up experiment which refutes the predictions of this alternative explanation. Additionally, I would expect that such an expectation-based effect would emerge in the same way at the second VP region (*nicht zu verbieten*), contrary to the results. The fact that the effect in the second region is delayed and sensitive to the illusory negation renders it more plausible that the effect is tied to an interpretative mechanism of NPI-licensing rather than a simple expectation of a negation. Moreover, an expectation-based approach is not able

[5] Thanks to Barbara Tomaszewicz for pointing this out.

to explain the special status of the illusory licensing, which, however, has been reported in other experiments employing different experimental methods.

In sum, the results of the experiment closely match the predictions of the V2-Reconstruction Hypothesis in the first region. In the second region, the results are compatible with the V2-Reconstruction Hypothesis but the high complexity of the embedded clause structure seems to have attenuated the effect considerably.

Table 6.1: Output of the LME model for first inifinitive (*drucken*) in Experiment 2

```
lmer(log.RT~Matrix.Verb*Illusory.Neg+trial+segment.length+
(1+Matrix.Verb*Illusory.Neg|participant.ID)+
(1+Matrix.Verb*Illusory.Neg|stimulus.ID))
```

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI −ILLUSORY.NEG)	5.7665	0.0431	133.8110	5.7966	0.0457	126.8162
MATRIX.VERB (+NPI)	0.0633	0.0225	2.8084	0.0733	0.0256	2.8607
+ILLUSORY.NEG (NEG)	0.0281	0.0157	1.7885	0.0141	0.0206	0.6820
trial	−0.0038	0.0003	−14.6113	−0.0042	0.0003	−12.3711
segment length	0.0130	0.0026	4.9311	0.0123	0.0033	3.7079
MATRIX.VERB:ILLUSORY.NEG	−0.0808	0.0249	−3.2511	−0.0707	0.0307	−2.3062

Table 6.2: Output of the LME model for first adverb segment (*unter*) in Experiment 2

```
lmer(log.RT~Matrix.Verb*Illusory.Neg+trial+segment.length+
(1+Matrix.Verb*Illusory.Neg|participant.ID)+
(1+Matrix.Verb*Illusory.Neg|stimulus.ID))
```

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI −ILLUSORY.NEG)	5.9148	0.0338	175.1867	5.9347	0.0364	163.2562
MATRIX.VERB (+NPI)	0.0638	0.0195	3.2666	0.0478	0.0234	2.0414
+ILLUSORY.NEG (NEG)	0.0034	0.0165	0.2084	0.0067	0.0221	0.3051
trial	−0.0038	0.0003	−14.1245	−0.0034	0.0003	−9.9244
segment length	−0.0017	0.0033	−0.4993	−0.0018	0.0045	−0.4040
MATRIX.VERB:ILLUSORY.NEG	−0.0514	0.0253	−2.0309	−0.0435	0.0306	−1.4224

Table 6.3: Output of the LME model for second adverb segment (*Umständen*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Illusory.Neg+trial+segment.length+ (1+Matrix.Verb+Illusory.Neg|participant.ID)+ (1+Matrix.Verb+Illusory.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI −ILLUSORY.NEG)	5.8850	0.0408	144.1579	5.8854	0.0433	135.9400
MATRIX.VERB (+NPI)	0.0393	0.0157	2.5077	0.0617	0.0195	3.1591
+ILLUSORY.NEG (NEG)	−0.0055	0.0161	−0.3440	0.0084	0.0188	0.4455
trial	−0.0035	0.0003	−13.1883	−0.0033	0.0003	−10.3265
segment length	0.0019	0.0028	0.7003	0.0027	0.0031	0.8776
MATRIX.VERB:ILLUSORY.NEG	−0.0323	0.0202	−1.6003	−0.0583	0.0250	−2.3351

Table 6.4: Output of the LME model for first inifinitive + adverb region (*drucken unter Umständen*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Illusory.Neg+trial+segment.length+ (1+Matrix.Verb*Illusory.Neg|participant.ID)+ (1+Matrix.Verb*Illusory.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI −ILLUSORY.NEG)	6.9783	0.0429	162.8133	7.0083	0.0469	149.4134
MATRIX.VERB (+NPI)	0.0673	0.0183	3.6767	0.0651	0.0196	3.3113
+ILLUSORY.NEG (NEG)	0.0120	0.0128	0.9367	0.0126	0.0154	0.8199
trial	−0.0040	0.0002	−19.0776	−0.0037	0.0003	−14.3091
segment length	0.0015	0.0014	1.0568	0.0007	0.0017	0.4087
MATRIX.VERB:ILLUSORY.NEG	−0.0639	0.0211	−3.0239	−0.0616	0.0244	−2.5251

Table 6.5: Output of the LME model for second infinitive particle (*zu*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+`
`(1+Matrix.Verb*Licensor.Neg+Illusory.Neg|participant.ID)+`
`(1+Matrix.Verb*Licensor.Neg+Illusory.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI +LIC.NEG+ILL.NEG)	5.9589	0.0384	155.2760	5.9777	0.0405	147.6867
MATRIX.VERB (+NPI)	−0.0202	0.0213	−0.9485	−0.0027	0.0274	−0.0997
−LICENSOR.NEG (POS)	−0.0506	0.0219	−2.3089	−0.0528	0.0282	−1.8746
−ILLUSORY.NEG (POS)	−0.0561	0.0208	−2.6988	−0.0480	0.0265	−1.8151
trial	−0.0040	0.0003	−15.8086	−0.0036	0.0003	−10.9976
MATRIX.VERB:LICENSOR.NEG	−0.0096	0.0292	−0.3286	−0.0275	0.0380	−0.7224
MATRIX.VERB:ILLUSORY.NEG	0.0561	0.0276	2.0343	0.0263	0.0352	0.7465
LICENSOR.NEG:ILLUSORY.NEG	0.0155	0.0275	0.5628	−0.0004	0.0352	−0.0126
M.VERB:LIC.NEG:ILL.NEG	0.0017	0.0388	0.0443	0.0398	0.0497	0.7997

Table 6.6: Output of the LME model for second infinitive (*verbieten*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+segment.length+`
`(1+Matrix.Verb*Licensor.Neg+Illusory.Neg|participant.ID)+`
`(1+Matrix.Verb+Licensor.Neg+Illusory.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI +LIC.NEG+ILL.NEG)	5.8755	0.0860	68.2893	5.8683	0.0896	65.4978
MATRIX.VERB (+NPI)	−0.0182	0.0378	−0.4821	−0.0493	0.0413	−1.1935
−LICENSOR.NEG (POS)	−0.0836	0.0358	−2.3346	−0.0971	0.0430	−2.2560
−ILLUSORY.NEG (POS)	−0.0458	0.0365	−1.2544	−0.0463	0.0419	−1.1063
trial	−0.0052	0.0004	−12.6238	−0.0051	0.0005	−10.4942
segment.length	0.0251	0.0055	4.5857	0.0302	0.0058	5.2455
MATRIX.VERB:LICENSOR.NEG	0.0428	0.0507	0.8445	0.0585	0.0552	1.0592
MATRIX.VERB:ILLUSORY.NEG	0.0459	0.0441	1.0403	0.0483	0.0526	0.9191
LICENSOR.NEG:ILLUSORY.NEG	0.0509	0.0442	1.1505	0.0606	0.0526	1.1516
M.VERB:LIC.NEG:ILL.NEG	−0.0344	0.0622	−0.5530	−0.0400	0.0743	−0.5380

Table 6.7: Output of the LME model for second infinitive region (*zu verbieten*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+segment.length+ (1+Matrix.Verb*Licensor.Neg+Illusory.Neg|participant.ID)+ (1+Matrix.Verb*Licensor.Neg+Illusory.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI +LIC.NEG+ILL.NEG)	6.5631	0.0695	94.4143	6.5559	0.0771	84.9951
MATRIX.VERB (+NPI)	−0.0226	0.0266	−0.8497	−0.0343	0.0314	−1.0936
−LICENSOR.NEG (POS)	−0.0763	0.0260	−2.9335	−0.0903	0.0328	−2.7512
−ILLUSORY.NEG (POS)	−0.0533	0.0270	−1.9718	−0.0548	0.0317	−1.7278
trial	−0.0046	0.0003	−15.0917	−0.0045	0.0004	−12.2199
segment.length	0.0167	0.0036	4.5958	0.0198	0.0044	4.4622
MATRIX.VERB:LICENSOR.NEG	0.0259	0.0360	0.7176	0.0321	0.0422	0.7610
MATRIX.VERB:ILLUSORY.NEG	0.0403	0.0329	1.2250	0.0392	0.0399	0.9845
LICENSOR.NEG:ILLUSORY.NEG	0.0540	0.0329	1.6443	0.0466	0.0399	1.1679
M.VERB:LIC.NEG:ILL.NEG	−0.0282	0.0463	−0.6096	−0.0125	0.0563	−0.2219

Table 6.8: Output of the LME model for the adjective of the spillover region (*mediale*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+segment.length+ (1+Matrix.Verb*Licensor.Neg+Illusory.Neg|participant.ID)+ (1+Matrix.Verb+Licensor.Neg+Illusory.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI −LIC.NEG+ILL.NEG)	5.8620	0.0456	128.4976	5.9030	0.0489	120.7331
MATRIX.VERB (−NPI)	−0.0623	0.0237	−2.6226	−0.0429	0.0286	−1.4970
+LICENSOR.NEG (NEG)	−0.0467	0.0226	−2.0702	−0.0412	0.0270	−1.5292
−ILLUSORY.NEG (POS)	−0.0560	0.0218	−2.5632	−0.0508	0.0269	−1.8903
trial	−0.0042	0.0003	−15.0489	−0.0040	0.0003	−11.9231
segment.length	0.0092	0.0022	4.1973	0.0065	0.0027	2.4600
MATRIX.VERB:LICENSOR.NEG	0.0439	0.0304	1.4440	0.0141	0.0375	0.3762
MATRIX.VERB:ILLUSORY.NEG	0.0651	0.0302	2.1532	0.0444	0.0368	1.2045
LICENSOR.NEG:ILLUSORY.NEG	0.0488	0.0301	1.6213	0.0326	0.0368	0.8856
M.VERB:LIC.NEG:ILL.NEG	−0.0655	0.0427	−1.5342	−0.0257	0.0521	−0.4926

Table 6.9: Output of the LME model for the noun of the spillover region (*Interesse*) in Experiment 2

```
lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+segment.length+
(1+Matrix.Verb*Licensor.Neg+Illusory.Neg|participant.ID)+
(1+Matrix.Verb*Licensor.Neg+Illusory.Neg|stimulus.ID))
```

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (–NPI –LIC.NEG–ILL.NEG)	5.7349	0.0422	135.8538	5.7375	0.0433	132.5118
MATRIX.VERB (+NPI)	0.0394	0.0233	1.6882	0.0535	0.0272	1.9655
+LICENSOR.NEG (NEG)	0.0556	0.0253	2.1943	0.0725	0.0289	2.5117
+ILLUSORY.NEG (NEG)	0.0006	0.0213	0.0262	0.0159	0.0272	0.5840
trial	−0.0034	0.0003	−12.6887	−0.0036	0.0003	−10.8754
segment.length	0.0152	0.0020	7.6812	0.0156	0.0021	7.3593
MATRIX.VERB:LICENSOR.NEG	−0.0523	0.0315	−1.6618	−0.0732	0.0376	−1.9441
MATRIX.VERB:ILLUSORY.NEG	−0.0087	0.0288	−0.3010	−0.0177	0.0360	−0.4919
LICENSOR.NEG:ILLUSORY.NEG	−0.0205	0.0288	−0.7136	−0.0547	0.0361	−1.5168
M.VERB:LIC.NEG:ILL.NEG	0.0338	0.0407	0.8309	0.0577	0.0510	1.1316

Table 6.10: Output of the LME model for the infinitive particle of the spillover region (*zu*) in Experiment 2

```
lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+
(1+Matrix.Verb+Licensor.Neg+Illusory.Neg|participant.ID)+
(1+Matrix.Verb+Licensor.Neg+Illusory.Neg|stimulus.ID))
```

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (–NPI –LIC.NEG–ILL.NEG)	5.8796	0.0295	199.6061	5.8879	0.0287	204.9369
MATRIX.VERB (+NPI)	0.0130	0.0179	0.7277	0.0121	0.0224	0.5394
+LICENSOR.NEG (NEG)	0.0184	0.0185	0.9911	0.0230	0.0231	0.9991
+ILLUSORY.NEG (NEG)	0.0061	0.0189	0.3247	0.0153	0.0229	0.6663
trial	−0.0027	0.0002	−11.5572	−0.0028	0.0003	−9.8815
MATRIX.VERB:LICENSOR.NEG	−0.0311	0.0252	−1.2329	−0.0273	0.0313	−0.8714
MATRIX.VERB:ILLUSORY.NEG	−0.0057	0.0253	−0.2248	−0.0010	0.0314	−0.0306
LICENSOR.NEG:ILLUSORY.NEG	−0.0413	0.0254	−1.6286	−0.0165	0.0313	−0.5258
M.VERB:LIC.NEG:ILL.NEG	0.0758	0.0358	2.1173	0.0393	0.0443	0.8875

Table 6.11: Output of the LME model for the verb of the spillover region (*wecken*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+segment.length+ (1+Matrix.Verb+Licensor.Neg+Illusory.Neg|participant.ID)+ (1+Licensor.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI −LIC.NEG−ILL.NEG)	5.8449	0.0561	104.1871	5.8542	0.0615	95.1699
MATRIX.VERB (+NPI)	0.0712	0.0274	2.6016	0.0750	0.0328	2.2854
+LICENSOR.NEG (NEG)	0.0772	0.0258	2.9915	0.1006	0.0335	3.0020
+ILLUSORY.NEG (NEG)	0.0896	0.0257	3.4810	0.0896	0.0332	2.7001
trial	−0.0040	0.0003	−11.9502	−0.0039	0.0004	−9.2995
segment.length	0.0078	0.0035	2.2231	0.0087	0.0044	1.9860
MATRIX.VERB:LICENSOR.NEG	−0.0661	0.0356	−1.8548	−0.0962	0.0456	−2.1091
MATRIX.VERB:ILLUSORY.NEG	−0.1085	0.0357	−3.0411	−0.1024	0.0457	−2.2423
LICENSOR.NEG:ILLUSORY.NEG	−0.0920	0.0358	−2.5667	−0.0804	0.0456	−1.7617
M.VERB:LIC.NEG:ILL.NEG	0.1120	0.0506	2.2140	0.1065	0.0645	1.6501

Table 6.12: Output of the LME model for the final 3-segments-region of the spillover region (*Interesse zu wecken*) in Experiment 2
`lmer(log.RT~Matrix.Verb*Licensor.Neg*Illusory.Neg+trial+segment.length+ (1+Matrix.Verb*Licensor.Neg+Illusory.Neg|participant.ID)+ (0+Matrix.Verb*Licensor.Neg+Illusory.Neg|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI −LIC.NEG−ILL.NEG)	6.8719	0.0463	148.3777	6.8899	0.0483	142.7712
MATRIX.VERB (+NPI)	0.0455	0.0177	2.5709	0.0487	0.0213	2.2874
+LICENSOR.NEG (NEG)	0.0616	0.0175	3.5227	0.0716	0.0221	3.2397
+ILLUSORY.NEG (NEG)	0.0466	0.0169	2.7602	0.0467	0.0218	2.1404
trial	−0.0037	0.0002	−16.8791	−0.0035	0.0003	−12.7953
segment.length	0.0063	0.0014	4.5722	0.0060	0.0015	3.8688
MATRIX.VERB:LICENSOR.NEG	−0.0470	0.0238	−1.9747	−0.0659	0.0301	−2.1895
MATRIX.VERB:ILLUSORY.NEG	−0.0562	0.0233	−2.4100	−0.0478	0.0300	−1.5937
LICENSOR.NEG:ILLUSORY.NEG	−0.0436	0.0233	−1.8702	−0.0492	0.0300	−1.6411
M.VERB:LIC.NEG:ILL.NEG	0.0561	0.0330	1.7001	0.0651	0.0424	1.5369

6.2 Experiment 3: Follow-up study on the NPI *brauchen* (self-paced reading)

This experiment is a follow-up study designed to test the predictions of an alternative explanation of the findings of Experiment 2.

6.2.1 Rationale

As noted in Section 6.1.4, the alternative explanation of the increased reading times in Experiment 2 is valid only because the canonical position of the negation and the position at which increased reading times start to emerge (*drucken* 'print') are separated only by the short infinitive particle *zu* 'to', as shown in (9a). To contrast the predictions of the two hypotheses, the distance between the canonical position of the negation and the reconstruction position has to be increased. This is achieved by inserting a prepositional phrase between the negation and the infinitive, such as the *an den Verlag* 'to the publisher' in (9b).[6]

(9) a. Letztendlich *braucht* der Autor den Roman (nicht) zu drucken #1 unter Umständen ...
finally needs the author the novel not to print under circumstances

b. Letztendlich *braucht* der Autor den Roman (nicht) [an den Verlag] zu schicken #1 unter Umständen ...
finally needs the author the novel not at the publisher to send under circumstances

In the extended structure (9b), the positions at which the different hypothesis predict longer reading times are now distinguishable. The expectation-based approach predicts that increased reading times due to a non-licensed NPI should appear on the segments following the canonical position of the negation, i. e. on the PP *an den Verlag* 'at the publisher'. The V2-Reconstruction Hypothesis, on the other hand, predicts that the licensing of the NPI will only be evaluated after reconstruction, i. e. reading times will not increase before the element directly preceding the reconstruction site, i. e. the verb *schicken* 'send'.

6.2.2 Method

Participants

We tested 48 participants (age 19–37 years, mean 22.9 years; 8 male; 4 left-handed), all self-declared German native speakers (5 bilinguals) and students of the University of Cologne. Participants either received course credits or a reimbursement of 4 €.

[6] Thanks to Daniel Gutzmann for pointing out this possibility of extending the materials.

Materials

The materials consisted of 32 items interspersed with 34 fillers (8 from Experiment 4) resulting in 66 stimuli per participants. All stimuli consisted of an introductory context of 1–2 sentences, a declarative target sentence and a comprehension question (50 % polar interrogatives and 50 % constituent questions).

An example of an experimental item is given in (10). The target items varied in a 2×3 design with the factors MATRIX.VERB and NEGATION. The finite verb was either the modal NPI-verb *brauchen* 'need to', as in (10b), (10d), and (10f) or the polarity-neutral verb *beschließen* 'decide', as in (10c), (10e), and (10g). The materials contained a LOW.NEGATION directly preceding the first infinitive as in (10b–10c), a HIGH.NEGATION preceding the second infinitive, as in (10d–10e), or no negation at all (NO.NEGATION), as in (10f–10g). Generally, the target sentences were very similar to the one from Experiment 2 above. The first major difference is that the materials of this experiment exhibited a PP, such as *an den Verlag* 'to the publishing company' between the canonical position of the negation and the first infinitive *zu schicken* 'to send'. As a consequence, the sentences also contained different predicates, namely such that take low argumental or adverbial PPs which canonically follow the sentential negation. Additionally, in comparison to Experiment 2, the number of conditions were reduced by dropping the doubly negated condition in order to eliminate a source of processing difficulty from the materials. Furthermore, I chose to use a different continuation for the conditions with a low negation, in (10b) and (10c). Those structures are not extended by an superordinate VP that would require an additional negation to render the NPI-condition grammatical. Now, only one of the six conditions is ungrammatical, namely (10f) with the NPI *brauchen* 'need to' and no negation in the sentence. All experimental items are given in the appendix.

(10) a. CONTEXT:
Ein Autor hat wegen seines neuen Romans Ärger mit seinem Verlag. Er bespricht mit seinem Anwalt, ob er das Manuskript auch an anderer Stelle veröffentlichen kann.

'An author has trouble with his publisher because of his new novel. He talks to his lawyer whether he could publish the manuscript also somewhere else.'

b. +NPI LOW.NEGATION
Letztendlich braucht der Autor den Roman nicht an den Verlag zu schicken
finally NPI the author the novel not at the publisher to send
#1 unter Umständen aber an ein Internetportal.
under circumstances however at an internet portal

'Thus the author doesn't have to send the novel to the publisher perhaps however to an internet portal.'

c. –NPI LOW.NEGATION
Letztendlich beschließt der Autor den Roman nicht an den Verlag zu schicken
finally decides the author the novel not at the publisher to send
#1 unter Umständen aber an ein Internetportal.
under circumstances however at an internet portal

'Thus the author decides to not send the novel to the publisher perhaps however to an internet portal.'

d. +NPI HIGH.NEGATION
Letztendlich braucht der Autor den Roman an den Verlag zu schicken #1 unter
finally NPI the author the novel at the publisher to send under
Umständen nicht sofort zu verbieten #2 um die rechtlichen Bestimmungen
circumstances not immediately to forbid for the legal regulations
zu wahren.
to preserve
'Thus the author doesn't have to immediately forbid to print the novel this time to preserve the legal regulations.'

e. −NPI HIGH.NEGATION
Letztendlich beschließt der Autor den Roman an den Verlag zu schicken
finally decides the author the novel at the publisher to send
#1 unter Umständen nicht sofort zu verbieten #2 um die rechtlichen
under circumstances not immediately to forbid for the legal
Bestimmungen zu wahren.
regulations to preserve
'Thus the author decides to not immediately forbid to print the novel this time to preserve the legal regulations.'

f. +NPI NO.NEGATION
*Letztendlich braucht der Autor den Roman an den Verlag zu schicken #1
finally NPI the author the novel at the publisher to send
unter Umständen sofort zu verbieten #2 um die rechtlichen Bestimmungen
under circumstances immediately to forbid for the legal regulations
zu wahren.
to preserve

g. −NPI NO.NEGATION
Letztendlich beschließt der Autor den Roman an den Verlag zu schicken #1
finally decides the author the novel at the publisher to send
unter Umständen sofort zu verbieten #2 um die rechtlichen Bestimmungen
under circumstances immediately to forbid for the legal regulations
zu wahren.
to preserve
'Thus the author decides to immediately forbid to print the novel this time to preserve the legal regulations.'

h. COMPREHENSION QUESTION:
Wer spricht mit seinem Anwalt?
'Who talks to his/its lawyer'
correct answer = *Der Autor* 'the author' wrong answer = *Der Verlag* 'the publishing company'

Procedure

The context was presented as one text block. The presentation of the target sentence began with a fixation cross and conformed to the centered self-paced reading paradigm (Just et al. 1982) in which the segments were presented non-cumulatively in a stationary window, i. e. participants saw only one word at a time at the center of the screen and had no visual cues that would allow them to predict the length of the sentences. Participant moved through the segments at their own pace by pressing the space bar. Each item contained a comprehension question, as in (10h), to control whether participants paid attention to the task. Answers to the comprehension questions were presented in the bottom left and right of the screen and were chosen by pressing the 'd' or 'k' key on a German keyboard respectively. After each response the participants saw a feedback message indicating whether their response was correct or not. Participants were instructed to read the sentences and to answer the questions as fast as possible in order to give correct responses.

The procedure was programmed in the python experiment suite PsychoPy (Peirce 2007) and run on a Windows PC in a psycholinguistics lab. The experimental stimuli were randomized according to the Latin square design, such that each participant saw each of the 32 items in exactly one of the 6 experimental conditions. The position of the correct answer to the comprehension question (left or right) was balanced across the items. The total list of stimuli (experimental items plus fillers) was automatically randomized by the experiment software. Experiments took approximately 25 minutes.

Data analysis

Prior to the analysis, all reading times larger than 2 seconds (n=43) have been excluded (0.06 % of the data). The participants' accuracy in response to the comprehension questions ranged from 78–100 % (mean 91 %). No participant was excluded from the analysis but all trials with a false response to the comprehension question were excluded (9.2 % of the data). The statistical handling of the data was identical to the procedure described for Experiment 2.

Data analysis proceeded in two steps: The initial sequence of the target sentences including the adverbial *unter Umständen* was identical for the HIGH.NEGATION and the NO.NEGATION condition. These two conditions were aggregated for the analysis of this region and contrasted to the LOW.NEGATION condition, resulting in a 2×2 analysis. The continuations for the LOW.NEGATION conditions differ from the continuation of the remaining four conditions. Hence the analyses for the continuations were carried out separately in a 1×2 and a 2×2 fashion respectively.

6.2.3 Results

A graphical summary of the result for the initial sequence is given in Figure 6.3. No effects could be detected on the negation and the two following segments of the PP *an* and *den*. On the noun of the PP *Verlag* the analysis revealed a simple effect of MATRIX.VERB ($t = -2.0090$) with longer reading times for the +NPI condition. On the infinitive particle *zu*, an interaction of MATRIX.VERB and NEGATION turned up indicating that the +NPI LOW.NEGATION condition

received shorter reading times than all other conditions. On first infinitive *schicken* 'send', the statistical analysis revealed a significant effect of NEGATION ($t = -2.2931$) with longer reading times for non-negated sentences. An analysis of the aggregated reading times of the infinitive region (*zu schicken*) yielded only a significant effect of NEGATION ($t = -3.1992$) with longer reading times for non-negated sentences. On the first adverbial segment *unter*, the analysis revealed a significant contrast in the non-negated sentences with longer reading times for the non-licensed +NPI condition ($t = -2.5087$). On the second adverbial segment *Umständen* the analysis revealed a similar contrast, however, in the negated sentences indicating longer reading times for the +NPI condition ($t = -2.0064$). The analysis of the aggregated reading times of the adverb region did not yield significant results. The exact model outputs of the analyses are given in Tables 6.13 to 6.18.

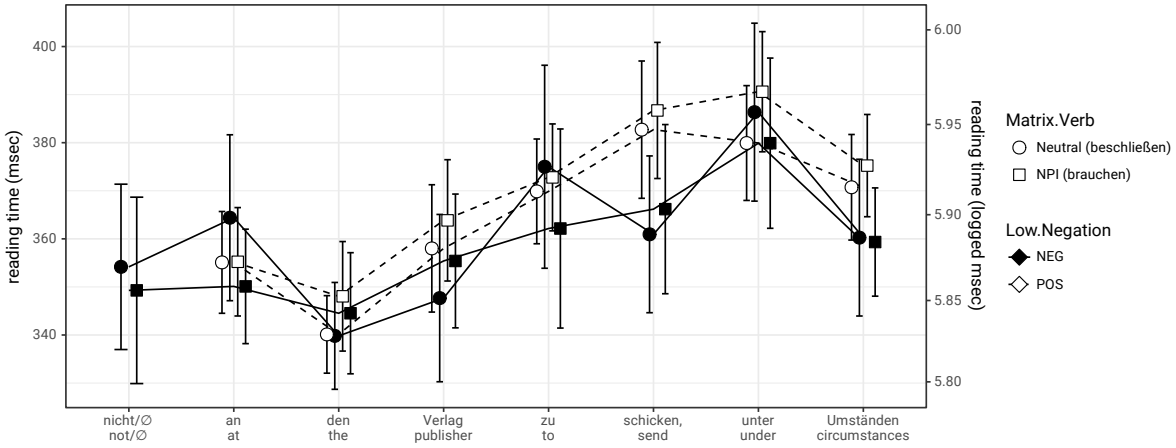


Figure 6.3: Mean reading times for the uniform initial region of interest in Experiment 3 (95 % CIs)

A graphical summary of the spillover region of the LOW.NEGATION conditions is given in Figure 6.4. No effects of the experimental conditions could be detected in this region. Even the contrast on the determiner *ein* 'an', which appears largest in Figure 6.4, did not reach significance in the raw model and decreased even further after model criticism.

A graphical summary for the continuation of the remaining conditions is presented in Figure 6.5. On the adverbial *sofort* directly following the negation, the analysis revealed a significant simple effect of NEGATION ($t = -2.3413$) with longer reading times for the HIGH.NEGATION conditions. On the adjective of the spillover region *rechtlichen* 'legal', the model revealed a significant contrast for MATRIX.VERB ($t = 2.4666$) and close to significant tendencies for NEGATION ($t = 1.9786$) and the interaction term ($t = -1.9326$). This indicates that reading times for the −NPI conditions are longer than for the +NPI conditions. Additionally, negation did not affect the −NPI condition. Within the +NPI condition, however, the ungrammatical NO.NEGATION condition showed longer reading times than the grammatical HIGH.NEGATION condition. No effects could be detected on the other segments. The exact model outputs are given in Tables 6.19 to 6.20.

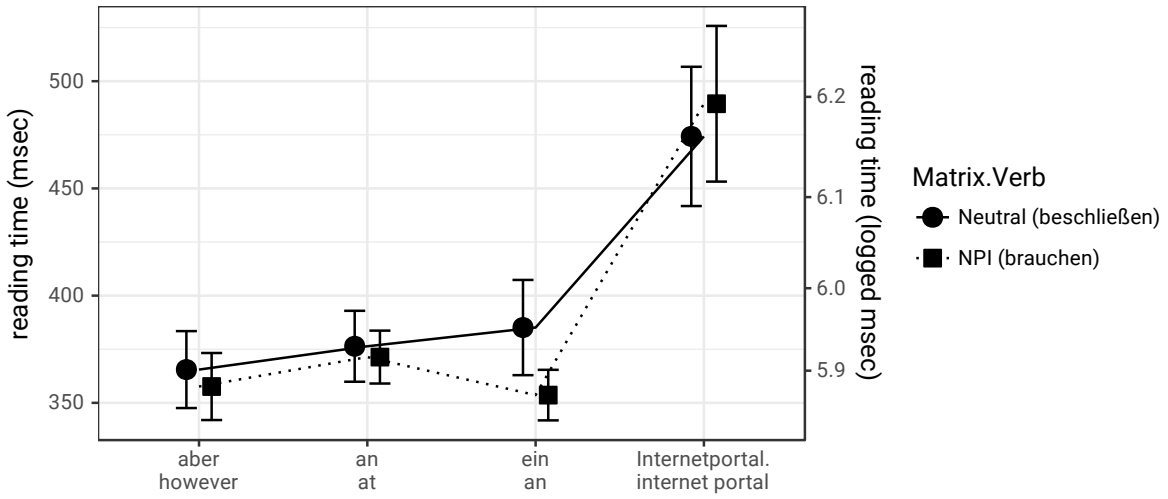


Figure 6.4: Mean reading times for the continuation of the LOW.NEGATION conditions in Experiment 3 (95 % CIs)

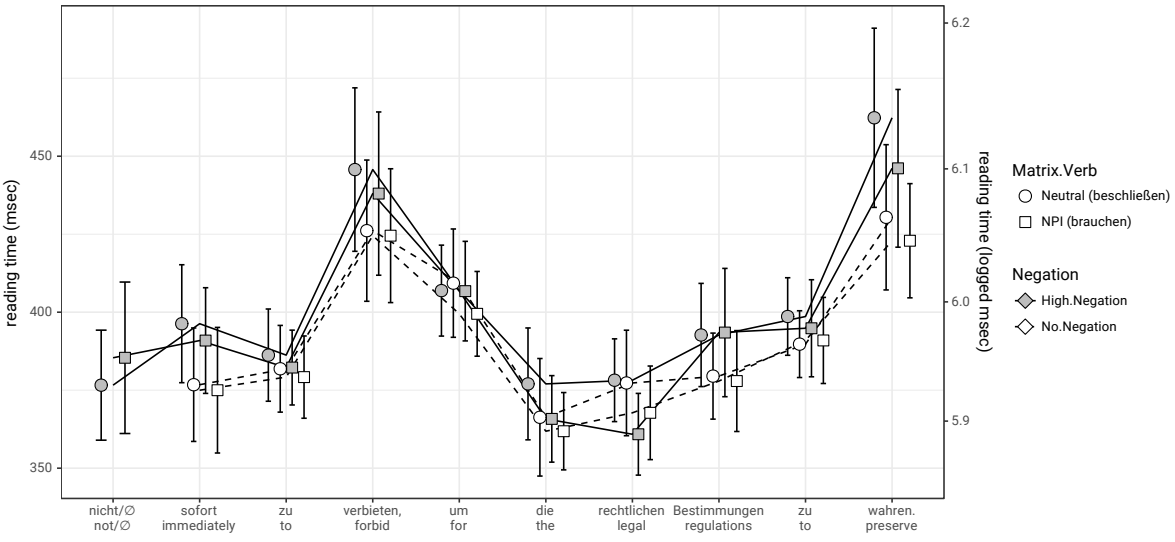


Figure 6.5: Mean reading times for the continuation with the second VP structure in Experiment 3 (95 % CIs)

6.2.4 Discussion

The results of this experiment did not replicate the clean interaction pattern of MATRIX.VERB and NEGATION on the first infinitive and the following two segments that was found in Experiment 2. Instead, the results indicated an effect at an earlier position preceding the infinitive, namely at the noun *Verlag*. Although the temporal profile matches the prediction of the expectation-based account, the form of the effect does not. Remember, this account predicts that an NPI in V2-position triggers an expectation for a negation. If this expectation is violated, we should observe prolonged reading times for the non-licensed +NPI. However, what we observed was longer reading times for NPI-verbs irrespective of negation. This indicates that, at this point, only the content of the V2-position is relevant. The negation seems to impact processing only on the following segments, the infinitive region *zu schicken*. Again, the result do not indicate that the processor expected a negation only for the NPI-verbs but the results indicate a general effect of negation. However, it is surprising that the presence of negation led to shorter reading times and not to longer ones, as we would plausibly expect. Interestingly, on the two subsequent segments the results showed specific interactions involving longer reading times for the NPI-verbs. This contrast appears on the first adverbial *unter* only in non-negated sentences and on the second adverbial *Umständen* only in negated sentences. It seems as if the presence of negation delayed the evaluation of the content of the verb. Although the results are not as predicted, they can receive an explanation under the V2-Reconstruction Hypothesis. The general verb-type effect that shows up at the noun *Verlag* might be a reflection of an automated reconstruction process. The finite verb is reconstructed and its content is reactivated. This reactivation seems to be more demanding for the +NPI verb *brauchen* 'need to'. Subsequently, with encounter of the infinitive, the finite verb is reconstructed into a potential base position. At this point, a negation-related process seems to apply. As noted above, it is surprising that this leads to faster processing in the negated sentences. Only on the subsequent segments, the lexical content of the reconstructed verb will be interpreted triggering longer reading times, first in the non-negated sentences and subsequently in the negated sentences.

The remainder of the sentence showed two effects. The first one, on the the adverbial *sofort*, is most likely a spillover effect from the preceding element. A preceding negation lead to prolonged reading times due to additional semantic processing. The second effect turned up on the adjective of the spillover region *rechtliche* 'legal'. The interaction at this point indicates that the content of the V2-verbs are interpreted with respect to the second negation. The ungrammatical +NPI NO.NEGATION condition showed longer reading times than the grammatical +NPI HIGH.NEGATION condition. This indicates that licensing of the NPI is reflected three segments after the second infinitive. Note that a comparable effect was found on the same segment in Experiment 2. This supports the assumption that this is an evaluation of the licensing requirements at the second reconstruction site, that appears a slightly delayed due to the relative complexity of the sentence.

Although the results are not as clear-cut as in Experiment 2, they clearly favor the V2-Reconstruction Hypothesis over the expectation-based approach. Remember that the latter predicted that negation-related effects should appear at the segments directly following the canonical position of the negation, i. e. the PP *an den Verlag* 'to the publisher'. However, no

such effects could be detected at those segments. Distant effects of the negation did not show up until the reconstruction position of the finite verb, i. e. the directly preceding infinitive *schicken* 'send', as predicted by the V2-Reconstruction Hypothesis.

Table 6.13: Output of the LME model for noun of the PP (*Verlag*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Low.Negation+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI –Low.Negation)	5.7416	0.0331	173.7189	5.7324	0.0377	152.0945
Matrix.Verb (–NPI)	−0.0253	0.0126	−2.0090	−0.0246	0.0168	−1.4596
+Low.Negation (NEG)	0.0147	0.0153	0.9607	−0.0073	0.0206	−0.3544
segment length	0.0067	0.0029	2.3430	0.0116	0.0033	3.4795
trial	−0.0056	0.0006	−9.8937	−0.0059	0.0006	−9.7096
Matrix.Verb:Low.Negation	−0.0149	0.0219	−0.6796	−0.0095	0.0293	−0.3255

Table 6.14: Output of the LME model for particle of the first infinitive (*zu*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Low.Negation+segment.length+trial+ (1+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI –Low.Negation)	5.8490	0.0308	190.0450	5.8701	0.0329	178.2923
Matrix.Verb (–NPI)	−0.0088	0.0119	−0.7385	−0.0127	0.0157	−0.8073
+Low.Negation (NEG)	−0.0319	0.0145	−2.1995	−0.0302	0.0192	−1.5761
trial	−0.0050	0.0005	−9.7793	−0.0052	0.0006	−9.3646
Matrix.Verb:Low.Negation	0.0198	0.0207	0.9550	0.0359	0.0273	1.3146

Table 6.15: Output of the LME model for first infinitive (*schicken*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Low.Negation+segment.length+trial+ (1+Matrix.Verb+segment.length+trial|participant.ID)+ (1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI –Low.Negation)	5.8420	0.0445	131.1401	5.8563	0.0492	119.0898
Matrix.Verb (–NPI)	−0.0177	0.0146	−1.2163	−0.0147	0.0177	−0.8313
+Low.Negation (NEG)	−0.0374	0.0163	−2.2931	−0.0390	0.0201	−1.9349
segment length	0.0024	0.0039	0.6204	0.0026	0.0043	0.6079
trial	−0.0061	0.0006	−9.7544	−0.0064	0.0007	−9.7246
Matrix.Verb:Low.Negation	0.0078	0.0233	0.3363	0.0059	0.0287	0.2064

Table 6.16: Output of the LME model for first infinitive region (*zu schicken*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Low.Negation+segment.length+trial+ (1+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI –Low.Negation)	6.5306	0.0587	111.3367	6.5454	0.0671	97.5947
Matrix.Verb (–NPI)	−0.0163	0.0111	−1.4593	−0.0123	0.0137	−0.8955
+Low.Negation (NEG)	−0.0434	0.0136	−3.1992	−0.0310	0.0168	−1.8499
segment length	0.0031	0.0041	0.7458	0.0029	0.0049	0.5931
trial	−0.0057	0.0006	−10.3249	−0.0059	0.0006	−10.0857
Matrix.Verb:Low.Negation	0.0196	0.0194	1.0126	0.0169	0.0239	0.7065

Table 6.17: Output of the LME model for first segment of the adverbial (*unter*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Low.Negation+segment.length+trial+ (1+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI –Low.Negation)	5.8981	0.0366	161.1577	5.9220	0.0412	143.5940
Matrix.Verb (–NPI)	−0.0314	0.0125	−2.5087	−0.0320	0.0157	−2.0415
+Low.Negation (NEG)	−0.0226	0.0153	−1.4807	−0.0192	0.0192	−1.0010
segment length	−0.0029	0.0050	−0.5763	−0.0030	0.0067	−0.4497
trial	−0.0049	0.0005	−9.6943	−0.0050	0.0006	−8.9305
Matrix.Verb:Low.Negation	0.0305	0.0218	1.3988	0.0270	0.0273	0.9897

Table 6.18: Output of the LME model for second segment of the adverbial (*Umständen*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Low.Negation+segment.length+trial+ (1+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI +LOW.NEGATION)	5.8319	0.0411	141.9282	5.8501	0.0435	134.3574
MATRIX.VERB (−NPI)	−0.0343	0.0171	−2.0064	−0.0174	0.0221	−0.7878
−LOW.NEGATION (POS)	0.0036	0.0145	0.2452	0.0239	0.0189	1.2682
segment length	0.0018	0.0027	0.6558	−0.0006	0.0032	−0.1868
trial	−0.0050	0.0006	−8.9633	−0.0051	0.0006	−8.0745
MATRIX.VERB:LOW.NEGATION	0.0191	0.0209	0.9138	−0.0024	0.0269	−0.0882

Table 6.19: Output of the LME model for the adverbial of the second VP (*sofort*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Negation+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (−NPI HIGH.NEGATION)	5.8101	0.0374	155.1934	5.8243	0.0409	142.3883
MATRIX.VERB (+NPI)	−0.0093	0.0175	−0.5294	−0.0124	0.0219	−0.5662
NEGATION (NO.NEGATION)	−0.0416	0.0178	−2.3413	−0.0311	0.0221	−1.4069
segment length	0.0104	0.0037	2.7672	0.0099	0.0041	2.4013
trial	−0.0061	0.0006	−10.1179	−0.0064	0.0007	−9.3876
MATRIX.VERB:NEGATION	0.0011	0.0250	0.0460	0.0062	0.0312	0.1988

Table 6.20: Output of the LME model for the adjective of the spillover region (*rechtliche*) in Experiment 3
`lmer(log.RT~Matrix.Verb*Negation+segment.length+trial+ (1+Matrix.Verb*Negation|participant.ID)+(1+Negation|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (+NPI HIGH.NEGATION)	5.8029	0.0432	134.4415	5.8010	0.0473	122.5629
MATRIX.VERB (−NPI)	0.0409	0.0166	2.4666	0.0534	0.0202	2.6463
NEGATION (NO.NEGATION)	0.0331	0.0167	1.9786	0.0429	0.0203	2.1128
segment length	0.0015	0.0036	0.4012	0.0015	0.0041	0.3642
trial	−0.0059	0.0006	−9.6125	−0.0060	0.0007	−8.7448
MATRIX.VERB:NEGATION	−0.0459	0.0238	−1.9326	−0.0401	0.0287	−1.3954

6.3 Experiment 4: Reconstruction of infinitive-embedding verbs (self-paced reading)

6.3.1 Rationale

The rationale of this experiments makes use of selectional properties of German verbs that embed infinitival verb phrases. Those verbs split into two groups. The majority of embedding verbs select infinitives which are preceded by the particle *zu* 'to', like the verb *versuchen* 'try' in (11a). Few verbs, however, embed bare infinitives, like the modal verb *müssen* 'must' in (11b).

(11) a. Uwe versucht den Zug *(zu) nehmen.
Uwe tries the train to take
'Uwe tries to take the train.'

b. Uwe muss den Zug (*zu) nehmen.
Uwe must the train to take
'Uwe must to take the train.'

Each of the embedding verbs may also embed a member of the other group which, in turn, selects an infinitive. The selection requirement, i. e. bare infinitive vs. particle, thereby applies strictly hierarchical from the embedding verb to the directly embedded verb, as indicated by the contrast between the V-final clauses in (12a) and (12b).

(12) a. ..., dass Uwe [[den Zug (*zu) nehmen] *(zu) müssen] versucht.
that Uwe the train to take to must tries
'... that Uwe tries to must take the train.'[7]

b. ..., dass Uwe [[den Zug *(zu) nehmen] (*zu) versuchen] muss.
that Uwe the train to take to try must
'... that Uwe must try to take the train.'

In V2-clauses, the finite verb moves to the left periphery. If the finite verb is automatically reconstructed after the first infinitive (#1), the string is temporarily ungrammatical because the first infinitive does not match the requirements of the finite verb as illustrated in (13) and (14).

(13) a. Uwe versucht [[den Zug nehmen] #1 zu müssen] #2 ~~versucht~~.
Uwe tries the train take to must

b. * Uwe versucht [[den Zug nehmen] ~~versucht~~] ...
Uwe tries the train take

(14) a. Uwe muss [[den Zug zu nehmen] #1 versuchen] #2 ~~muss~~.
Uwe must the train to take try

[7] Clearly, the meaning of this combination is quite unusual. Assume that Uwe intentionally creates a situation, in order to set himself under pressure, in which he has no choice but to take a certain train.

b. * Uwe muss [[den Zug zu nehmen] ~~muss~~] …
Uwe must the train to take

6.3.2 Method

Participants and procedure

Participants and procedure are identical to Experiment 3 because both experiments have been combined in one experimental run.

Materials

Materials consisted of 8 experimental items interspersed with 58 fillers (32 from Experiment 3) resulting in 66 stimuli per participant. All stimuli consisted of an introductory context of 1–2 sentences, a declarative target sentence and a comprehension question (50 % polar interrogatives and 50 % constituent questions).

An example item is given in (15). All target clauses have an adverbial in the sentence-initial position. The V2-position was filled with an infinitive-embedding verb which varied according to the experimental condition MATRIX.VERB, either selecting an infinitive with a particle (PARTICLE), like *beabsichtigen* 'intend' in (15b), or selecting a bare infinitives (BARE) like *müssen* 'must' in (15c). In both conditions, the identical ditransitive non-finite VP followed the V2-position. The infinitive of this VP, *zu navigieren* 'to navigate', was always preceded by the infinitive particle *zu* 'to'. Consequently, the sentence could be a well-formed structure only in the PARTICLE condition but not in the BARE condition as indicated by the starred reconstruction position (#1) in (15c). Only after a 2-segment adverbial, like *am Anfang* 'in the beginning', a second infinitive was presented, which corresponded to the selectional requirements of the respective matrix verbs rendering all items well-formed. A 6-segment embedded clause followed the infinitive to detect potential spillover effects.

(15) a. CONTEXT:
Ein Bauarbeiter hat den Arbeitgeber gewechselt. Hier müssen nun die Fahrzeuge jeden Abend in die engen Garagen geparkt werden.
'A construction worker changed his employer. Here, the vehicles now have to pulled into the narrow garages every evening.'

b. PARTICLE
Logischerweise beabsichtigt der Bauarbeiter den Lastwagen in die Garage
logically intends the construction worker the truck into the garage
zu navigieren #1 am Anfang erst zu lernen, damit das teure Fahrzeug
to navigate at the beginning first to learn so that the expensive vehicle
heil bleibt.
undamaged remains
'Naturally, the construction worker intends to learn how to navigate the truck into the garage first, so that the expensive vehicle will remain undamaged.'

c. BARE
Logischerweise muss der Bauarbeiter den Lastwagen in die Garage zu
logically must the construction worker the truck into the garage to
navigieren *#1 am Anfang erst lernen, damit das teure Fahrzeug heil
navigate at the beginning first to learn so that the expensive vehicle
bleibt.
undamaged remains
'Naturally, the construction worker must learn how to navigate the truck into the garage first, so that the expensive vehicle will remain undamaged.'

d. COMPREHENSION QUESTION:
Von welchem Fahrzeug war hier die Rede?
'What kind of vehicle was talked about?'
correct answer = *von einem Laster* 'about a truck' wrong answer = *von einem Bagger* 'about an excavator'

According to the V2-Reconstruction Hypothesis, the finite verbs will be automatically reconstructed and interpreted after the first infinitive *navigieren*. In the BARE condition, however, the infinitive does not match the selectional requirements of the finite matrix verb. Hence, I predict longer reading times for the BARE condition at this segment.

The low number of items is a consequence of the low number of verbs selecting a bare infinitive overall. I could not come up with more verbs that could be paired with a canonical cluster verb that is either synonymous or at least replaceable in the same context. The verb pairs of the materials are given Table 6.21, all experimental items are given in the appendix.

Table 6.21: Pairs of cluster verb in Experiment 4

BARE	PARTICLE
muss 'must'	*beabsichtigt* 'intends'
soll 'should'	*probiert* 'tries'
darf 'is allowed'	*gedenkt* 'intends'
möchte 'wants'	*plant* 'plans'
lässt 'lets'	*intendiert* 'intends'
kommt 'comes to'	*versucht* 'tries'
kann 'can'	*verlangt* 'demands'
sieht 'sees'	*verpflichtet* 'obligates'

Data analysis

Prior to the analysis, all reading times larger than 2 seconds (n=43) have been excluded (0.06 % of the data). The participants' accuracy in response to the comprehension questions ranged from 63–100 % (mean 87 %). No participant was excluded from the analysis but all trials

with a false response to the comprehension question were excluded (13 % of the data). The statistical handling of the data was identical to the procedure described for Experiment 2.

6.3.3 Results

A graphical summary of the reading times of the region of interest, ranging from the V2-position until the spillover region, is given in Figure 6.6. On the subject determiner *der* 'the', the model revealed longer reading times for the PARTICLE condition ($t = -2.1779$). On the first infinitive *navigieren* 'navigate' the analysis indicated longer reading times for the PARTICLE condition only in the first model. After model criticism, the effect decreased below significance ($t = -1.7229$) indicating that the effect was mostly driven by extreme values. The analysis revealed longer reading times for the BARE condition only on the first adverbial segment *am* ($t = 2.1286$) but no effect on the second segment *Anfang*. The analysis of the aggregated reading times for the region *am Anfang* 'at the beginning' indicated longer reading times for the BARE condition ($t = 2.8873$). On the second infinitive *lernen*, the analysis revealed longer reading times for the PARTICLE condition ($t = -2.3438$). No effects could be detected on the other segments. The exact model outputs of the analyses are given in Tables 6.22 to 6.26.

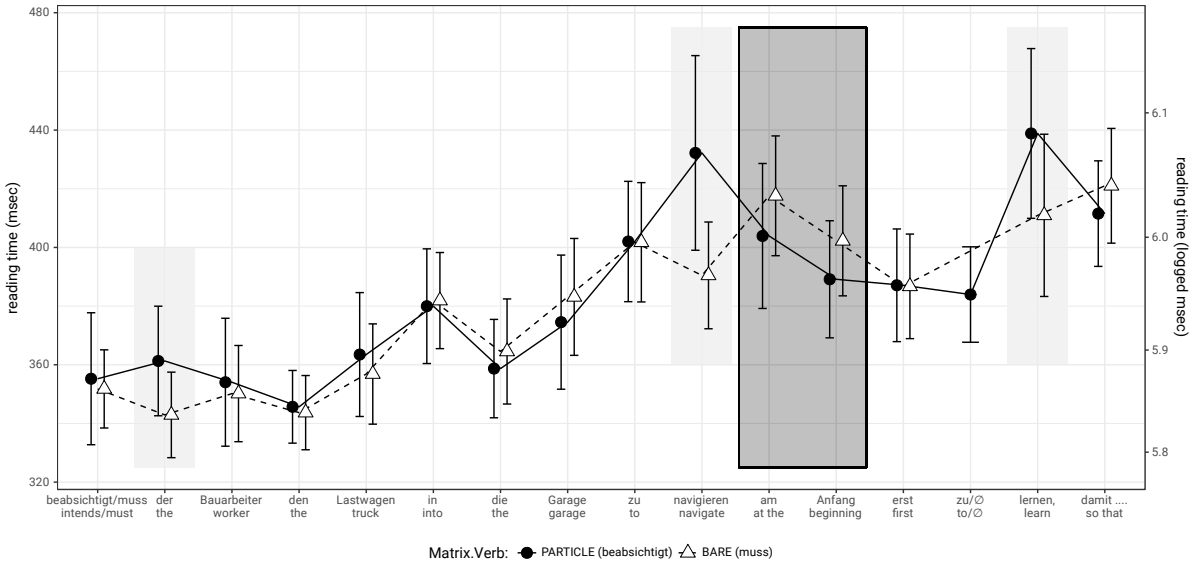


Figure 6.6: Mean reading times in from the V2-position until the spillover region in Experiment 4 (95 % CIs)

6.3.4 Discussion

In line with the predictions above, the results indicated longer reading times for the BARE condition on the two segments following the first possible reconstruction site of the matrix verb *am Anfang* 'at the beginning', i. e. the dark-gray area Figure 6.6. I assume that with

the encounter of the infinitive *navigieren* 'navigate' the matrix verb is automatically reconstructed and interpreted. In the BARE condition, the resulting representation is ill-formed because the infinitive is accompanied by the infinitive particle *zu* 'to', which violates the selectional requirements of matrix verbs like *müssen* 'must' which select a bare infinitive. The response to this temporary ungrammaticality is reflected by the longer reading times on the two adverb segments *am Anfang* 'at the beginning'. Note that an alternative explanation based on an incremental interpretation would predict the opposite effect. Assume that incoming material is integrated in the parse strictly from left to right without resorting to reconstruction. In the PARTICLE condition, the parse could be completed after the first infinitive *navigieren*. Hence the encounter of the adverbial *am Anfang* would indicate that the structure is not yet complete which should trigger a reanalysis reflected by prolonged reading times. In the BARE condition, on the other hand, the first infinitive does not match the selectional requirements of the matrix verb. Therefore, the parse could not be completed at this point. The encounter of the adverbial does not trigger a reanalysis but only continues the current structure. In sum, under a strictly incremental approach, we would expect longer reading times in the PARTICLE condition, contrary to the facts.

The results indicated longer reading times in the PARTICLE condition at three segments, i. e. the light-gray areas in Figure 6.6. Two of them are probably spillover effects caused by the directly preceding elements: The effect on the subject determiner is most likely caused by the previous segment, which consisted of the different lexical matrix verbs varying according to the experimental conditions. The effect on the second infinitive *lernen* might also be interpreted as a spillover effect. Remember that in the PARTICLE condition, the infinitive was preceded by the particle *zu* 'to' whereas, in the BARE condition, the infinitive was adjacent to the preceding adverbial. Only the tendency on the first infinitive *navigieren* 'navigate' is certainly a distant effect related to the matrix verb. Considering the linear distribution of these contrasts, I assume that all three effects stem from one underlying mechanism, i. e. they reflect lexical (re)activation processes. Initially, lexical access of the verbs in the PARTICLE condition is more demanding than for the verbs in the BARE condition which induces longer reading times at the first encounter of the verbs, i. e. on the segment following the V2-position. According to the V2-Reconstruction Hypothesis, the matrix verb is reactivated at the segments directly preceding its potential base position, i. e. at the two infinitives *navigieren* and *lernen* (see also the results of experiments 2 and 3). At these position, the lexical reactivation of the verbs of the PARTICLE condition is also more costly; again reflected by locally prolonged reading times. Additionally, this explanation matches the temporal profile of the intended experimental effect. The mismatch effect of the infinitive selection directly follows the lexical reactivation of the matrix verb at the first infinitive, because evaluation of selectional requirements depends on the lexical information.

In sum, the experiment yielded the predicted results, i. e. a mismatch effect directly following a potential reconstruction site, thereby supporting the V2-Reconstruction Hypothesis. Additionally, the results indicate that lexical reactivation precedes the evaluation of selectional requirements of embedding verbs at their reconstruction sites.

Table 6.22: Output of the LME model for determiner of the subject (*der*) in Experiment 4
`lmer(log.RT~Matrix.Verb+trial+(1|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (PARTICLE)	5.7966	0.0392	147.9671	5.8143	0.0410	141.8559
MATRIX.VERB (BARE)	−0.0461	0.0212	−2.1779	−0.0503	0.0262	−1.9211
trial	−0.0042	0.0006	−6.8288	−0.0048	0.0008	−6.3209

Table 6.23: Output of the LME model for the first infinitive (*navigieren*) in Experiment 4
`lmer(log.RT~Matrix.Verb+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (PARTICLE)	5.6763	0.0940	60.3957	5.6235	0.0855	65.7551
MATRIX.VERB (BARE)	−0.0397	0.0230	−1.7229	−0.0715	0.0288	−2.4802
segment.length	0.0260	0.0099	2.6165	0.0361	0.0093	3.8913
trial	−0.0055	0.0009	−6.1586	−0.0059	0.0010	−5.7025

Table 6.24: Output of the LME model for the first adverb segment (*am*) in Experiment 4
`lmer(log.RT~Matrix.Verb+segment.length+trial+(1+trial| participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (PARTICLE)	5.7774	0.0460	125.6477	5.8078	0.0543	106.8798
MATRIX.VERB (BARE)	0.0490	0.0230	2.1286	0.0454	0.0275	1.6494
segment.length	0.0457	0.0120	3.8110	0.0409	0.0154	2.6540
trial	−0.0045	0.0009	−4.7716	−0.0051	0.0009	−5.7851

Table 6.25: Output of the LME model for the second 2-segment adverb region (*am Anfang*) in Experiment 4
`lmer(log.RT~Matrix.Verb+segment.length+trial+(1|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (PARTICLE)	6.5201	0.1117	58.3604	6.5371	0.1150	56.8254
MATRIX.VERB (BARE)	0.0571	0.0198	2.8873	0.0382	0.0232	1.6479
segment.length	0.0065	0.0107	0.6023	0.0067	0.0111	0.6084
trial	−0.0051	0.0006	−8.7960	−0.0051	0.0007	−7.5005

Table 6.26: Output of the LME model for the second infinitive (*lernen*) in Experiment 4
`lmer(log.RT~Matrix.Verb+segment.length+trial+(1+Matrix.Verb+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (PARTICLE)	5.8328	0.0875	66.6348	5.8028	0.1248	46.5084
MATRIX.VERB (BARE)	−0.0646	0.0275	−2.3438	−0.0529	0.0380	−1.3938
segment.length	0.0108	0.0073	1.4781	0.0160	0.0115	1.3930
trial	−0.0060	0.0009	−6.5301	−0.0071	0.0011	−6.1781

6.4 Experiment 5: Verb reconstruction and word order preferences (self-paced reading)

6.4.1 Rationale

The rationale of this experiment connects closely to the findings about thematic processing, which have been discussed in Section 5.3.1. There, I have summarized that effects related to the thematic structure of the verb are only found at the assumed base position of the finite verb, irrespective whether the lexical verb specifying the thematic structure of the clause appears in the V2-position or in its base position. Previous experiments, however, included additional factors that influence thematic processing such as case-ambiguity, two animate arguments, and dative case. In this experiment, we[8] investigate the influence of the thematic information of the verb in V2-position on the processing of the arguments in relatively unmarked structures. We contrast the *experiencer-first* preference of experiencer object (EO) verbs with the *subject-first* preference which assumably holds for the default processing routine as well as non-experiencer verbs (non-Exp). The abstract schematics in (16)–(18) illustrate the linear ordering of the critical configurations. Consider (16), if the V2-position is occupied by an auxiliary like *haben* 'have', no information about the thematic roles of the arguments is available to the processor by the time the arguments are processed. The processor must rely on the default *subject-first* preference until it reaches the lexical verb. Hence, we expect that the subject≺object order is processed faster than the object≺subject order, as indicated by the pointing glyph.

(16) a. ☞ XP Auxiliary Subject Object | EO/non-Exp verb ~~Auxiliary~~
b. XP Auxiliary Object Subject | EO/non-Exp verb ~~Auxiliary~~
PREFIELD V2 DP1 DP2 V(+I)

The same pattern is expected for non-Exp verbs. If the thematic information of the lexical verb influences argument processing, we expect a preference for the subject≺object order in (17). If the finite verb is only interpreted in its base position, we expect the same effect although caused by the default processing routine analogously to the V2-auxiliary cases in (16).

(17) a. ☞ XP non-Exp verb $\text{Subject}_{\text{AGENT}}$ $\text{Object}_{\text{THEME}}$ | ~~non-Exp verb~~
b. XP non-Exp verb $\text{Object}_{\text{THEME}}$ $\text{Subject}_{\text{AGENT}}$ | ~~non-Exp verb~~
PREFIELD V2 DP1 DP2 V(+I)

Clauses with an experiencer object verb in the V2-position, however, constitute critical test cases. There, the experiencer-first preference conflicts with the subject-first preference. Objects of experiencer verbs are more likely to precede the subject, than objects of non-experiencer verbs, as experimentally confirmed by Temme & Verhoeven (2016: 783-790). We assume that the experiencer-first preference also affects online-processing directly in such

[8] This experiment presents collaborative work with Anne Temme. I will therefore use *we* in this chapter purposely.

a way that the object≺subject order is processed faster, as indicated in (18). Crucially, this only holds under the assumption that the information about the thematic roles encoded in a verb in V2-position is immediately activated at its surface position, where it precedes its arguments. Under the V2-Reconstruction Hypothesis, however, we expect that the lexical meaning of the verb in V2-position, including the information about the thematic roles, is only interpreted in its base position, which follows its arguments. Thus, initially, the experiencer object structures in (18) will be processed with the same default subject≺object preference that we predict for the V2-auxiliary structures in (16). We expect that verb-type-specific effects will occur only right-adjacent to the second argument in transitive structures, similar to the results of Scheepers et al. (2000).

(18) a. XP EO-verb $\text{Subject}_{\text{STIM}}$ $\text{Object}_{\text{EXP}}$ | ~~EO-verb~~

b. ☞ XP EO-verb $\text{Object}_{\text{EXP}}$ $\text{Subject}_{\text{STIM}}$ | ~~EO-verb~~

PREFIELD V2 DP1 DP2 V(+I)

Additionally, two hypotheses apply to the V-final condition, corresponding to scheme (16) above. First, thematic role assignment may apply anticipatorily: In absence of a lexical verb that specifies the thematic roles, the processor assigns thematic roles by default, maybe guided by properties of the arguments such as animacy and case (see Bornkessel & Schlesewsky 2006a). If, however, two verbs which assign different thematic roles follow the identical argument configuration, we expect that at least for one verb the roles have to be reassigned, which should be reflected in increased processing costs. Alternatively thematic role assignment may be delayed in absence of an assigner. Following this path the assignment of thematic roles remains underspecified until the lexical verb is encountered. In principle, both assignment procedures are compatible with the V2-Reconstruction Hypothesis and an incremental processing hypothesis. However, we assume the delayed assignment to be the more economic variant if applied to V2-cases. Otherwise, the processor would assign incorrect thematic roles by default even though the information about the assigner would, in principle, be available.

To sum up, this experiment uses three factors to diagnose the influence of thematic information of lexical verbs on on-line processing. If the lexical verb is presented late, in its base position, as in (16), the verb cannot influence the processing of the arguments and the default processing routine must take place, preferring subject≺object order. If, however, the lexical verb appears in V2-position, the information about the thematic roles is principally available. Under a strict incremental processing hypothesis, we expect that the information about the thematic roles will decrease the subject-first preference for experiencer object verbs immediately after the encounter of the lexical verb. In contrast, under the V2-Reconstruction Hypothesis, we expect that the processing of the arguments always proceeds according to the default mechanism because the lexical meaning of the verb in V2-position will only be interpreted in its base position. Thus, we expect an interaction of verb type and argument order in any case but two different temporal profiles according to respective hypotheses.

6.4.2 Method

Participants

We tested 48 participants (age 19–50 years, mean 24 years; 7 male; 4 left-handed), all self-declared German native speakers (6 bilinguals) and students of the University of Cologne. Participants either received course credits or a reimbursement of 4 €.

Procedure

The self-paced reading procedure was almost identical to Experiment 3 above. The only difference was that the target sentences were not presented strictly word per word but also larger phrases were presented at once, as indicated for the material below.

The context was presented as one text block. The presentation of the target sentence began with a fixation cross and conformed to the centered self-paced reading paradigm (Just et al. 1982) in which the segments were presented non-cumulatively in a stationary window, i. e. participants saw only one segment at a time at the center of the screen and had no visual cues that would allow them to predict the length of the sentences. Participant moved through the segments at their own pace by pressing the space bar. Each item contained a comprehension question to control whether participants paid attention to the task. Answers to the comprehension questions were presented in the bottom left and right of the screen and were chosen by pressing the 'd' or 'k' key on a German keyboard respectively. After each response the participants saw a feedback message whether their response was correct or not. Participants were instructed to read the sentences and answer the question as fast as possible in order to give correct responses.

The procedure was programmed in the python experiment suite PsychoPy (Peirce 2007) and run on a Windows PC in a psycholinguistics lab. The experimental stimuli have been randomized according to the Latin square design, such that each participant saw each of the 32 items in exactly one of the 6 experimental conditions. The position of the correct answer to the comprehension question (left or right) was balanced across the items. The total list of stimuli (experimental items plus fillers) were automatically randomized by the experiment software. Experiments took approximately 20 minutes.

Materials

The materials consisted of 32 experimental items interspersed with 32 filler items resulting in 64 stimuli per participant. The 32 filler items included two sets of control structures with 8 items each, which are explicated below. All stimuli consisted of a context of 1–2 sentences, a declarative target sentence and a comprehension question (50% polar interrogatives and 50% constituent questions).

The target sentences varied in a $2 \times 2 \times 2$ design with the factors V-Type, V-Position, and Word Order. An example item is given in (19). The context sentences, such as (19a), introduced two concepts which are supersets to the subject and object of the target sentence, such as *traditional methods* for *the woven coat*, and *people who work with bees* for *the beekeeper*. This unspecific introduction should avoid increased reading times especially for information

structurally marked object≺subject (OS) orders (see Weskott 2003: 62–76). The target sentences were presented in segments as indicated in (19b). The sentence-initial segment was a sentence adverbial. By filling the prefield, we ensured that all arguments would follow the V2-position. The V2-position (C) was either filled by the auxiliary *hat* 'has' in the V-FINAL conditions such as (19b), or by the lexical verb in the simple past form, such as *verblüffte* 'baffled', in the V2 conditions, see (19d). The subsequent positions of DP1 and DP2 are separated by a high temporal adverb, such as *letztens* 'recently'.[9] The two DP-positions are filled by the subject *der gewebte Mantel* 'the woven coat' and the object *den vorsichtigen Imker* 'the cautious beekeeper' corresponding to the subject≺object (SO) and OS condition respectively. The nominative subject was always inanimate and the accusative object was always animate. Both nouns were always masculine singular such that they exhibit unambiguous case marking in German. A low process-related adverbial, such as *total* 'totally', separated the lower argument from the clause-final position (V) which was filled only in the V-FINAL condition, namely by the participle of the lexical verb, such as *verblüfft* 'baffled' in (19b). The two clause-internal adverbials have been inserted to separate the critical DP-regions and the clause-final verb so that effects of one region would not immediately spill over onto the next region. All conditions contained an embedded clause as a final spillover region, which was divided into four segments: a subordination, a definite DP, and two segments that showed larger variation between items in order to create meaningful continuations for all scenarios. The lexical verb was either an experiencer object verb in the EXPERIENCER conditions, such as *verblüffen* 'baffle' in (19b–19e), or a non-experiencer verb in the NON-EXPERIENCER conditions, such as *schützen* 'protect' in (19f–19g). The non-experiencer verbs do not form a natural class, however, many of them are causative verbs. They have in common that they are non-psych verbs which take inanimate subjects (stimulus) and animate objects (theme/patient). In some of the items, the low adverb and the spillover regions differed between the two verb classes in order to maintain plausibility.

(19) a. CONTEXT:
Traditionelle Methoden sind immer noch das Mittel der Wahl für Leute, die mit Bienen arbeiten.

'Traditional methods are still the means of choice for people who work with bees.'

b. EXPERIENCER–V-FINAL–SO

Offenbar	hat	der	gewebte	Mantel	letztens	den	vorsichtigen	Imker		
apparently	has	the	woven	coat	recently	the	cautious	beekeeper		
PREFIELD	C	DP1			HIGHADV	DP2				
total	verblüfft,	obwohl	die	Bienen	ziemlich	angriffslustig	waren.			
totally	baffled	although	the	bees	quite	aggressive	were			
LOWADV	V	SPILL1	SPILL2		SPILL3		SPILL4			

'Apparently, the woven coat recently baffled the cautious beekeeper totally although the bees were quite aggressive.'

[9] See Frey & Pittner (1998) or Frey (2003) for an overview of base positions of adverbials in German.

c. EXPERIENCER–V-FINAL–OS
Offenbar hat den vorsichtigen Imker letztens der gewebte Mantel total
apparently has the cautious beekeeper recently the woven coat totally
verblüfft, obwohl die Bienen ziemlich angriffslustig waren.
baffled although the bees quite aggressive were

d. EXPERIENCER–V2–SO
Offenbar verblüffte der gewebte Mantel letztens den vorsichtigen Imker
apparently baffled the woven coat recently the cautious beekeeper
total, obwohl die Bienen ziemlich angriffslustig waren.
totally although the bees quite aggressive were

e. EXPERIENCER–V2–OS
Offenbar verblüffte den vorsichtigen Imker letztens der gewebte Mantel
apparently baffled the cautious beekeeper recently the woven coat
total, obwohl die Bienen ziemlich angriffslustig waren.
totally although the bees quite aggressive were

f. NON-EXPERIENCER–V-FINAL/V2–SO
Offenbar hat/ schützte der gewebte Mantel letztens den vorsichtigen Imker
apparently has/ protected the woven coat recently the cautious beekeeper
genug geschützt/ ∅, obwohl die Bienen ziemlich angriffslustig waren.
enough protected although the bees quite aggressive were
'Apparently, the woven coat recently protected the cautious beekeeper sufficiently although the bees were quite aggressive.'

g. NON-EXPERIENCER–V-FINAL/V2–OS
Offenbar hat/ schützte den vorsichtigen Imker letztens der gewebte Mantel
apparently has/ protected the cautious beekeeper recently the woven coat
genug geschützt/ ∅, obwohl die Bienen ziemlich angriffslustig waren.
enough protected although the bees quite aggressive were

h. COMPEHENSION QUESTION:
Werden neue Methoden bevorzugt bei der Arbeit mit Bienen?
'Are novel methods preferred in beekeeping?'
correct answer = *Nein* 'No' wrong answer = *Ja* 'Yes'

The factor V-TYPE differs from the other two factors in so far as the individual lexical verbs are fixed with respect to the different lexicalizations. Each EO-verb was paired with a corresponding non-experiencer verb, such as *verblüffen* 'baffle' with *schützen* 'protect'. Moreover, the number of suitable verb pairs is rather restricted so that we only used 16 different verb pairs in this experiment. Each of these pairs appeared twice in the experimental material, although with different accompanying lexical material. However, we ensured that each participant saw each lexicalization and each lexical verb of the pair only once during the experiment, e. g. the EXPERIENCER verb with lexicalization A and the NON-EXPERIENCER verb with lexicalization B. Apart from that, the factors varied according to a Latin square design.

The AGENTIVE control structures, illustrated in (20), consisted of the same number and types of segments as the experimental items in (19). In contrast to the experimental items,

they contained verbs that select an agent, such as *zerreißen* 'rip' and more prototypical arguments: The nominative subject was animate and the accusative object was inanimate. Like in the experimental items, the DPs were always definite, masculine, singular and contained an adjectival modifier. These control structures were constructed only in the canonical SO order. They provide a baseline for a prototypical subject-first preference and allow to gauge whether the non-prototypical animacy properties of the experimental items led to a deviation of this preference.

(20) Agentive-controls

a. Context:
Die Arbeiter auf der Baustelle leiden oft darunter, dass zu wenig Material für die anstehenden Arbeiten vorhanden ist.

'The workers on the construction site often suffer from the fact that too little material for the upcoming work is available.'

b. V-final–SO
Deswegen | hat | der dicke Maler | heute | den alten Lappen | kurzerhand | zerissen,
hence has the fat painter today the old rag quickly ripped
| damit | die Lehrlinge | beide etwas | zum Abwischen | hatten.
so that the apprentices both something to wipe had

'Hence the fat painter ripped up the old rag today so that both apprentices had something to wipe.'

c. V2–SO
Deswegen zeriss der dicke Maler heute den alten Lappen kurzerhand, damit
hence ripped the fat painter today the old rag quickly so that
die Lehrlinge beide etwas zum Abwischen hatten.
the apprentices both something to wipe had

d. Comprehension question:
Haben die Bauarbeiter zu wenig Material?

'Did the construction workers lack material?'
correct answer = *Ja* 'Yes' wrong answer = *Nein* 'No'

The Configurational control structures, illustrated in (21), also consisted of the same number and types of segments, as the experimental items. These control structures contain *configurational* verbs, such as *umgeben* 'surround', and two inanimate arguments. This verb class resembles experiencer object verbs in two respects, which makes them useful control structures: First, they take inanimate nominative subjects, and second, they also show a relatively unmarked object$\prec$subject order. However, the unmarked object$\prec$subject order depends on the definiteness of the subject. Therefore, the nominative subject of these verbs was always an indefinite DP. The accusative object, however, was always definite. Both DPs were masculine singular and contained an adjectival modifier. Like the experimental items, these control structures varied according to the two factors V-Position and Word Order as shown in (21). All stimuli are given in the appendix.

(21) Configurational-controls

a. Context:
Die Archäologen untersuchen die auffälligen Steinformationen in der Nähe des alten Klosters. Etwas war hier besonders.

'The archaeologists investigate the peculiar stone formation in the vicinity of the old monastery. Something was special here.'

b. V-final–SO
Offenbar | hat | ein hoher Schutzwall | damals | den weiten Acker |
apparently has a high protective barrier back then the large field
vollständig | umgeben, | damit | die Ernte | in unruhigen Zeiten | verteidigt
completely surrounded so that the harvest in turbulent times protected
werden konnte.
be could

'Apparently, a large protective barrier surrounded the large field entirely back then so that the harvest could be protected in turbulent times.'

c. V-final–OS
Offenbar hat den weiten Acker damals ein hoher Schutzwall vollständig
apparently has the large field back then a high protective barrier completely
umgeben, damit die Ernte in unruhigen Zeiten verteidigt werden konnte.
surrounded so that the harvest in turbulent times protected be could

d. V2–SO
Offenbar umgab ein hoher Schutzwall damals den weiten Acker
apparently surrounded a high protective barrier back then the large field
vollständig, damit die Ernte in unruhigen Zeiten verteidigt werden konnte.
completely so that the harvest in turbulent times protected be could

e. V2–OS
Offenbar umgab den weiten Acker damals ein hoher Schutzwall
apparently surrounden the large field back then a high protective barrier
vollständig, damit die Ernte in unruhigen Zeiten verteidigt werden konnte.
completely so that the harvest in turbulent times protected be could

f. Comprehension question:
Umgab der Schutzwall nur den Marktplatz?

'Did the protective barrier surround the market square?'
correct answer = *No* 'No' wrong answer = *Ja* 'Yes'

Data analysis

We removed all data points with reading times larger than 3 seconds (0.018 % of the data). The participants' accuracy in response to the comprehension questions ranged from 78–97 % (mean 90 %). No participant was excluded but we dismissed all trials of the experimental items with a falsely answered comprehension question (8.4% of the data). The statistical handling of the data was identical to the procedure described for Experiment 2.

The statistical analysis proceeded in four steps: The first analysis covered only the initial segments from the V2-position until the high adverb. The V-FINAL conditions of both verb types are identical because for both verbs the auxiliary *hat* 'has' appears in the V2-position. Hence, we analyzed this region with a 3×2 analysis, featuring three types of verbs in the V2-position, auxiliaries, EXPERIENCER and NON-EXPERIENCER and the two levels of WORD ORDER, SO and OS. In a second step, we analyzed the clause-final verb and the spillover region. This analysis was carried out with two separate models for the V2 and the V-FINAL condition respectively. In the third step, we compared the SO conditions with the AGENTIVE controls. In the fourth step, we analyzed the CONFIGURATIONAL controls.

6.4.3 Results and Discussion

Experimental items

Main clause A graphical summary of the reading times of the main clause segments is given in Figure 6.7. On the DP1-segment, the analysis revealed that the AUXILIARY conditions showed significantly shorter reading times than the EXPERIENCER condition ($t = 3.7550$), and than the NON-EXPERIENCER condition ($t = 2.4896$). These differences are robust for both WORD ORDER conditions. Whereas the EXPERIENCER condition showed numerically the longest reading times, the contrast to the NON-EXPERIENCER condition is non-significant. On the high adverb *letztens*, we detected a significant contrast between the EXPERIENCER-SO and the NON-EXPERIENCER-SO condition ($t = 2.0207$) with longer reading times for the latter. Additionally, the model also revealed a significant interaction ($t = -2.1677$), which indicates that the SO-order caused longer reading times in the NON-EXPERIENCER condition, whereas the opposite holds for the EXPERIENCER condition and the AUXILIARY condition, in which the OS-order led to longer reading times. On the DP2-segment, the analysis revealed a significant contrast of WORD ORDER for the EXPERIENCER verbs ($t = 4.5269$) with longer reading times for the OS-order. Additionally, the interaction terms indicate that the WORD ORDER effect is smaller for the AUXILIARY and the NON-EXPERIENCER condition. Subsequent analyses revealed that reading times for the OS condition are significantly longer in the AUXILIARY condition too, whereas they are only numerically longer in the NON-EXPERIENCER condition and did not reach significance. On the low adverb *total*, we found a significant contrast between the NON-EXPERIENCER-SO and the AUXILIARY-SO condition ($t = -2.1027$) with longer reading times for the former. The exact model outputs of these analyses are given in Tables 6.27 to 6.30.

Note that for the V-FINAL conditions (AUXILIARY), which we consider the baseline with respect to default processing of arguments, we have found an effect of WORD ORDER only on a single segment: On the DP2-segment, reading times for the OS condition were longer than in the SO condition ($t = 3.0534$), see Table 6.31.

Verb + Spillover The reading times for the clause-final verb and the following spillover region are displayed in Figure 6.8. On the clause-final verb, the analyses revealed the shortest reading times for the EXPERIENCER-SO conditions with significant contrasts to the NON-EXPERIENCER ($t = 2.0361$) and to the OS condition ($t = 2.3428$). Within the NON-EXPERIENCER condition the WORD ORDER difference is non-significant, see Table 6.32.

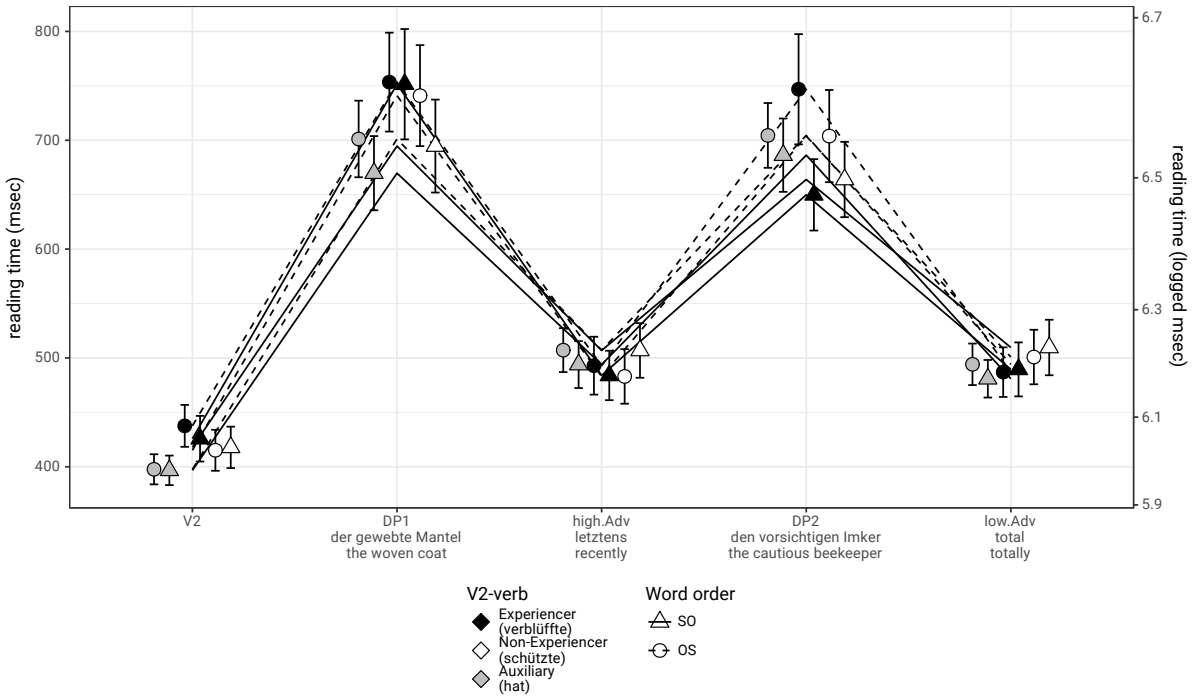


Figure 6.7: Mean reading times for the initial part of Experiment 5 (95 % CIs)

The respective analyses of the spillover region of the V2 condition and the V-FINAL condition indicated only non-significant tendencies for segment 1–3 and a significant contrast only on the final segments, see Tables 6.33 to 6.36. We summarized the reading times for spillover segment 1 and 2, as well as for spillover segment 3 and 4 to obtain a more robust pattern, as displayed in Figure 6.9. In the V2 subset (small icons), we found a significant interaction of V-TYPE and WORD ORDER ($t = -2.0100$) in the first region, indicating that OS-order causes longer reading times for the EXPERIENCER verbs, whereas OS-order causes shorter reading times for NON-EXPERIENCER-verbs. In the final region, the analysis revealed two main effects, with longer reading times for EXPERIENCER-verbs ($t = 3.3371$) and OS-order ($t = 2.0726$). In the V-FINAL subset (large icons), no effect could be found on the first spillover region. In the final region, however, the analysis revealed a significant contrast of V-TYPE ($t = 3.8937$) indicating that the EXPERIENCER-SO condition showed longer reading times than the NON-EXPERIENCER-SO condition, see Tables 6.37 to 6.39.

Interim discussion On the first DP, we found only a categorial contrast between the auxiliaries and longer reading times for the lexical verbs. This effect is present on subjects and objects alike. We assume that this is most likely a spillover effect from the preceding segment, the V2-position, reflecting differences of the initial processing such as lexical access, due to length and frequency. On the high adverb *letztens*, the NON-EXPERIENCER-SO condition shows prolonged reading times in comparison to the other conditions. This indicates that, in this condition, some additional or demanding process is initiated. Two possibilities come to our mind: First, the subject is incrementally integrated into the parse and some incongruity

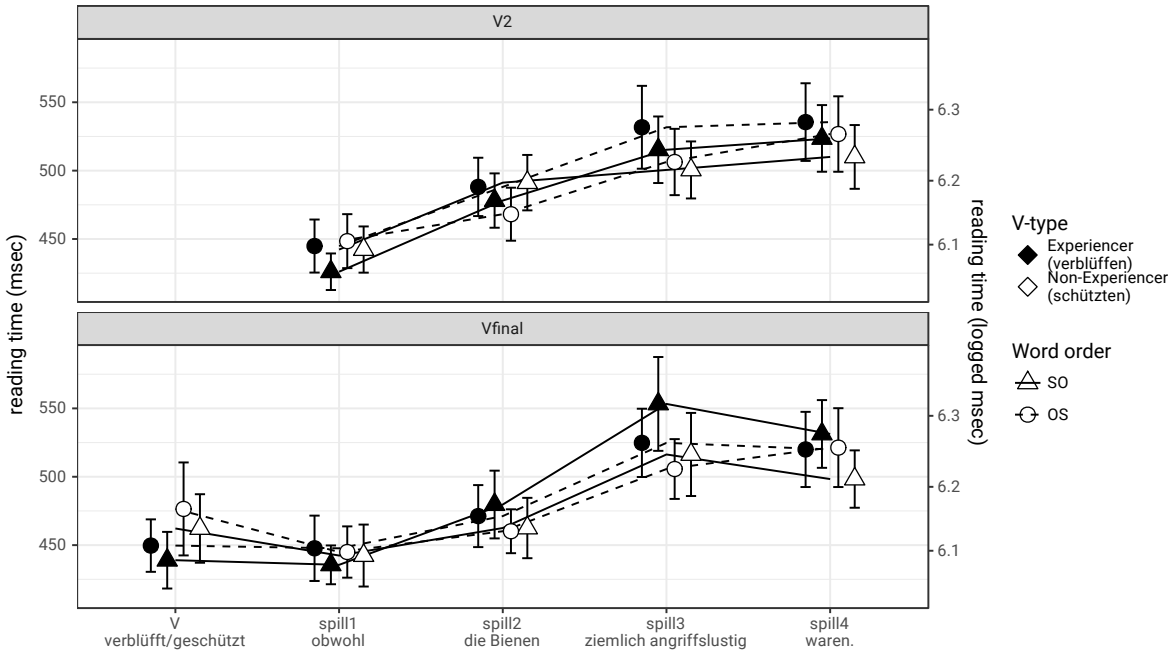


Figure 6.8: Mean reading times for the clause-final verb and the spillover region in Experiment 5 (95 % CIs)

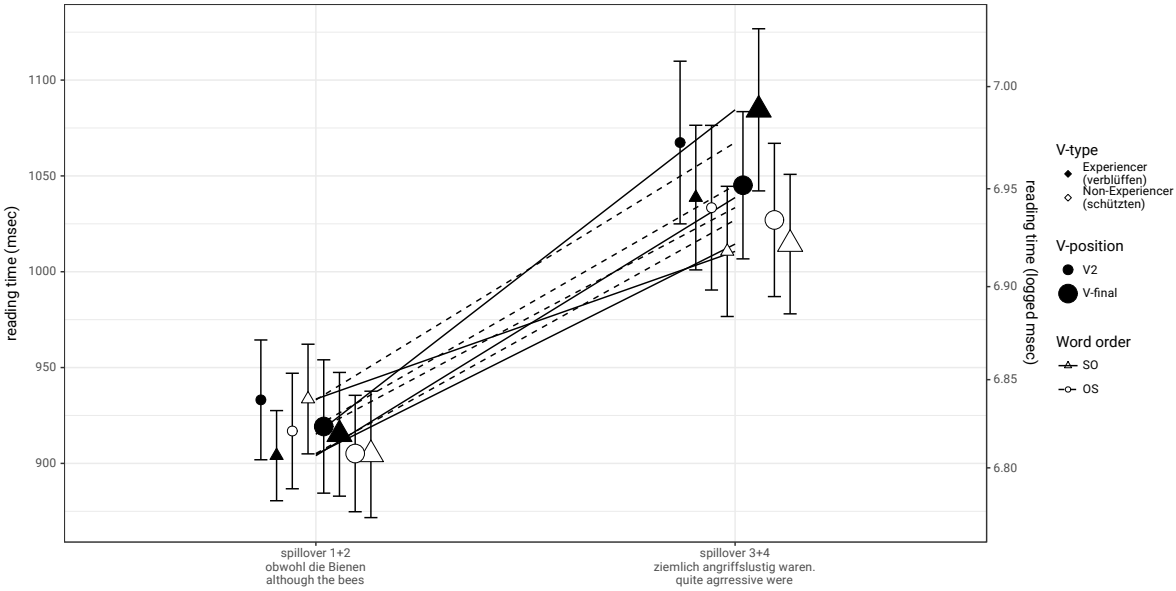


Figure 6.9: Mean reading times for the summarized regions of the spillover are in Experiment 5 (95 % CIs)

or implausibility triggers prolonged reading times. Second, the finite verb is reconstructed with the encounter of the subject, as it would be the case for intransitive verbs, and the prolonged reading times are a reflection of the initiated interpretation process. However, visual inspection of individual items did not support either of this hypothesis. Therefore, we must leave open what the reason for this effect is. On the second DP, we found longer reading times for the non-canonical OS order across verb types. However, the strength of this reading time difference was modulated as a function of the verb in the V2-position. The baseline group with the auxiliary in the V2-position showed a robust reading time difference between SO and OS order. This difference is approximately twice as large in the EXPERIENCER-V2 condition whereas, in the NON-EXPERIENCER-V2 condition, it is smaller than in the baseline condition. This modulation indicates that the different verb classes interact with the word order which must reflect verb-related processing. Interestingly, the modulation seems to affect the slow-down of OS and the speed-up of SO uniformly, i. e. for all verb classes the two orders seem to be distanced from a potential zero value, see Figure 6.7. On the low adverb *total*, we found longer reading times of the NON-EXPERIENCER-SO in comparison to the respective V-FINAL baseline condition. This effect looks similar to the one that appeared on the high adverb. Moreover, this penalty for the NON-EXPERIENCER-SO condition continues into the first summarized spillover region but reverses in the final spillover region. At the clause-final verb, we found effects of verb type and word order. This matches the predictions for anticipatory assignment of thematic roles in that it probably reflects a reranking of the thematic roles after the lexical verb was encountered. In the spillover region, we found that, in the V2 condition, the penalty for the NON-EXPERIENCER-SO continues on the first two spillover segments, which we also interpret as a reflection of a thematic reranking process. On the two final segments, the factors V-TYPE and WORD ORDER affect the reading times uniformly, which we assume to reflect discourse integration costs, which are higher for experiencer verbs and non-canonical object$\prec$subject order. In the V-FINAL condition, on the hand, no effect turned up on the first two spillover segments, indicating that the thematic reranking is completed on the clause-final verb. Only on the last two segments, we find again an interaction of V-TYPE and WORD ORDER. We assume that this interaction also reflects discourse integration, like in the V2 condition. However, we must leave open why the SO order seems to be dispreferred in the V-FINAL condition only.

Agentive controls

A graphical summary of the main clause segments of the AGENTIVE controls and the SO subset of the experimental items is given in Figure 6.10.[10] The analysis of the AGENTIVE controls revealed only one significant contrast: On the DP1-segment, which was always the subject, we found a simple effect of V-POSITION with longer reading times for the V2 condition. This was confirmed by a combined analysis of the DP1-segment for the AGENTIVE

[10]Note that the content of the respective segments of the experimental items and the AGENTIVE controls are not identical and therefore contain length differences, especially the larger segments such as DP1 and DP2. These differences are accounted for in the statistical analysis. Note also that the V-FINAL condition of the EXPERIENCER condition and the NON-EXPERIENCER condition are identical until the final segment of this plot. They are represented by two different points for technical reasons.

controls and the SO subset of the experimental items, which revealed a significant contrast for V-Position with longer reading times for the V2 condition ($t = 3.3680$) that remains significant across verb types, see Table 6.40.

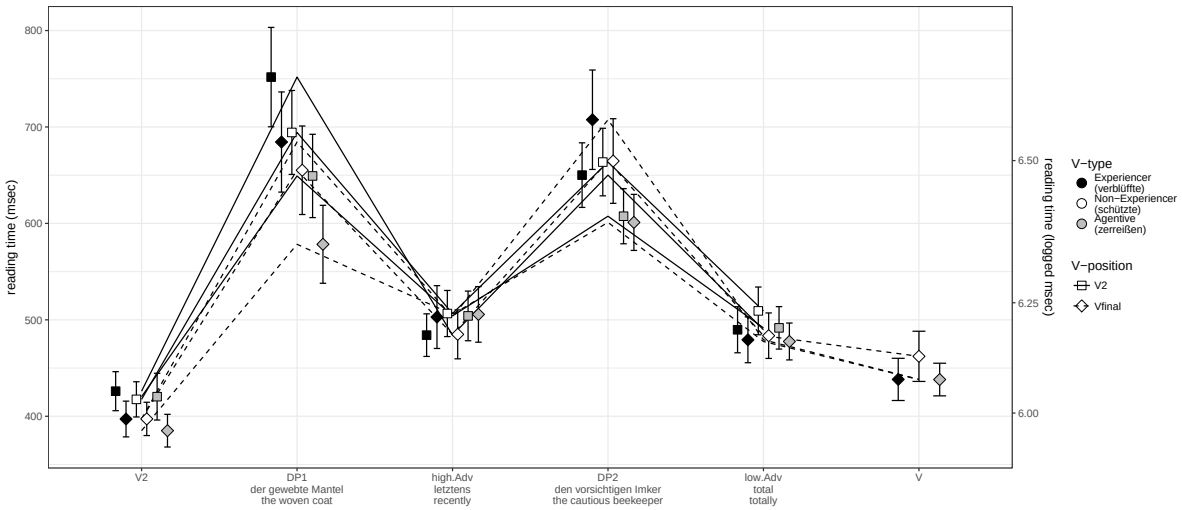


Figure 6.10: Mean reading times of the main clause segments for the experimental items of Experiment 5 and the Agentive controls in the SO order only (95 % CIs)

Like in previous analysis, we aggregated the reading times for the spillover segments 1+2, and 2+3, as shown in Figure 6.11. The analysis of the spillover regions did not reveal any new contrast in addition to the primary analysis above. Generally, the Agentive controls pattern with the Experiencer verbs. No contrast to the experimental conditions reaches significance, see Tables 6.41 to 6.42.

Interim discussion The comparison with the Agentive controls strengthened the assumption that the V-Position effect on the DP1-segment is a general contrast of auxiliaries and lexical verbs and not verb-type-specific. Furthermore, the comparison with the corresponding conditions of the experimental items did not yield any significant contrasts which indicates that the non-prototypical animacy properties of the arguments of the experimental items did not induce serious differences in reading times.

Configurational controls

The reading times of the Configurational controls are graphically summarized in Figure 6.12. The statistical analysis revealed the following effects: On the DP1-segment, we found two main effects with shorter reading times for the V-final condition ($t = -2.3378$) and the SO condition ($t = -3.2434$), see Table 6.43. On the high adverb *damals*, the V2-OS condition showed significantly shorter reading times than the V-final-OS condition ($t = 2.7019$) and the V2-SO condition ($t = 2.8287$), see Table 6.44. On the DP2-segment, the analysis revealed a main effect of V-Position with longer reading times for the V-final

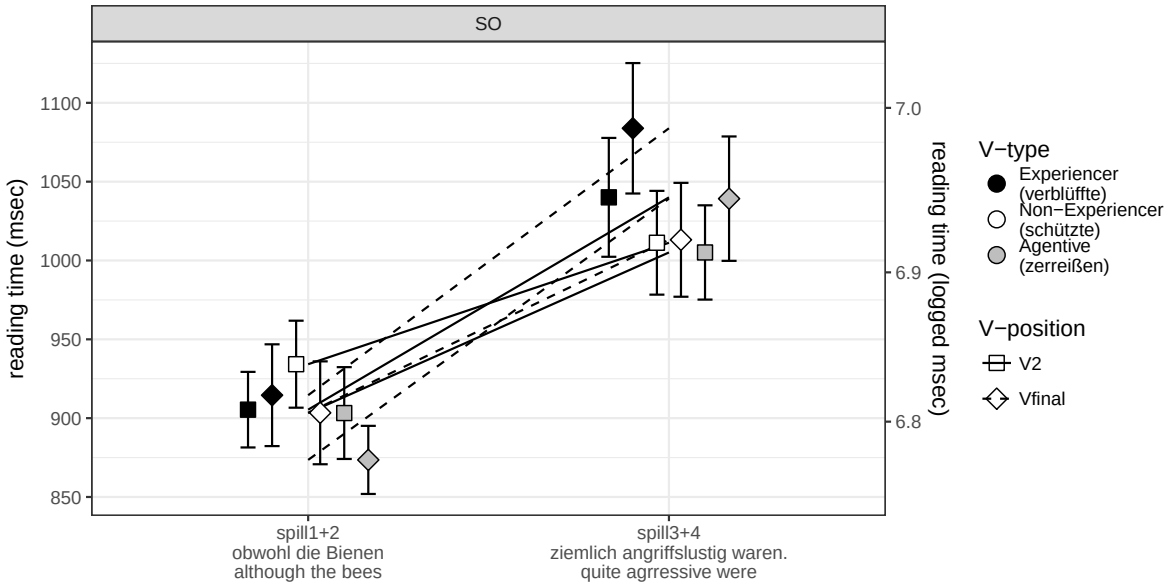


Figure 6.11: Mean reading times for the summed spillover regions of Experiment 5 with the AGENTIVE controls (95 % CIs)

condition ($t = 3.8157$), see Table 6.45. No effects could be detected on the low adverb *vollständig* or on the clause-final participle *umgeben*. On the spillover segment 1 *damit*, we detected a main effect of V-POSITION ($t = -3.1641$) with longer reading times for the V2 condition, see Table 6.46. On the spillover segment 2 *die Ernte*, the analysis revealed a significant contrast between the V2-SO condition and the V-FINAL-SO condition ($t = 2.2100$) with longer reading times for the latter. Additionally, the model also yielded a significant interaction ($t = -2.5702$), indicating that in the V2 condition OS showed longer reading times than the SO whereas the opposite holds in the V-FINAL condition, see Table 6.47. No effects could be detected on the remaining two segments.

Interim discussion On the DP1-segment, we found the same contrast with shorter reading times for the V-FINAL condition which was present for the other verb types above. This further strengthens the assumption that this effect is a spillover effect from the preceding segment, which reflects the smaller processing demand for the initial activation of the auxiliary. Additionally, we found shorter reading times for the SO conditions on this segment. However, considering that this effect reached significance only for this verb class, it is likely that this is a definiteness effect. Remember that, only for the CONFIGURATIONAL controls, the arguments differed in definiteness. On the high adverb *damals*, we found an interaction that shows the profile of an object-first preference only when the lexical verb appeared in the V2-position. This effect appears to be very local. In contrast to the other verb types, we didn't find a reading time difference corresponding to WORD ORDER on the second DP but only a contrast of V-TYPE. Additionally, it is rather unexpected that the V2 conditions show longer reading times. We suspect that the speed-up of the V2 condition on this segment stands in a relation with the relative slow-down on the first spillover segment. Similarly, the

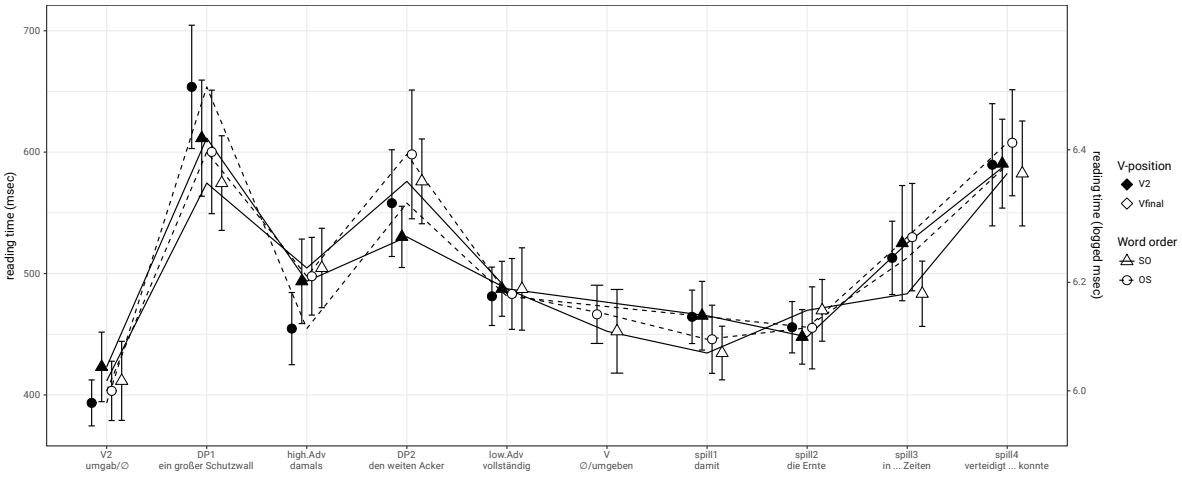


Figure 6.12: Mean reading times for the CONFIGURATIONAL controls in Experiment 5 (95 % CIs)

interaction on the spillover segment 2 indicates that, in the V-FINAL condition, some main clause related processing is still going on whereas the argument order related aspects are already completed in the V2 condition.

6.4.4 General discussion

In line with our predictions, we found a subject-first preference in the V-FINAL baseline condition. This preference manifested itself on the DP2-segment with shorter reading times for the SO condition and is the signature of the default argument processing. Also in line with the predictions of the V2-Reconstruction Hypothesis, the EXPERIENCER condition patterned with the V-FINAL baseline (except for DP1) and the AGENTIVE controls, as if the arguments are processed by the default routine despite the lexical verb surfaced in the V2-position. Only at the second argument, we found the expected verb-type dependent modulation of the WORD ORDER preference. This is the first segment where the V2-Reconstruction Hypothesis predicts verb-related processing effects to appear because with the encounter of the DP2-segment the reconstruction site of the verb can be postulated. In contrast to our predictions, however, the EXPERIENCER verbs did not reflect an OS preference (experiencer-first) but instead showed a stronger subject-first preference than the V-FINAL baseline and the NON-EXPERIENCER condition. The NON-EXPERIENCER verbs, on the other hand, showed a penalty for the canonical SO order that surfaces after both arguments and extends to the first half of the spillover region. We interpreted the latter effect as a thematic reranking process that is likewise observable at the clause-final participles in the V-FINAL condition. The prolonged reading times on the high adverb, directly following the first argument in the NON-EXPERIENCER-SO condition indicates that a verb-related process may start directly after the subject. As for now, it remains unclear, what causes this effect and why it only appears for NON-EXPERIENCER-verbs and neither for the EXPERIENCER verbs nor for the AGENTIVE verbs. A similar indication for a immediate argument structure processing is observable for the CONFIGURATIONAL controls,

for which V2-OS shows shorter reading times, maybe reflecting an object-first preference. However, effects for these verb classes have to be interpreted with care because the two arguments also involved a definiteness difference. The profile of these early effects match the predictions of the incremental processing hypothesis and constitutes a problem for the V2-Reconstruction Hypothesis. One possibility: Even under the V2-Reconstruction Hypothesis, we need some routine that keeps track of the incoming material which decides when the finite verb must be reconstructed and the interpretation process will be initiated. The early effects could then be interactions with this monitoring process. As for now, we must leave this issue to further research.

Our experiments reproduced some results of previous studies. Like Scheepers et al. (2000), we found a modulation of the S$\prec$O-preference involving experiencer object verbs. In contrast to their results, we detected an increase of this preference rather than a mitigation. However, our study used only unambiguously marked arguments which could influence the anticipatory assignment of thematic roles, as could the fact that our material involved an animacy contrast. Furthermore, Scheepers et al. (2000) found the mitigation effect in late eye tracking measures. Therefore the correlates of their effect might have to be searched in the spillover region. Although we detected some residuals of verb-argument processing in the spillover region, the effects are not uniform for V2 and V-FINAL sentences and thus not straightforwardly identifiable. A further contrast that may influence the timing of the results is that Scheepers et al. (2000) contrasted main clauses with embedded clauses whereas we contrasted only main clauses but with different verb forms. In relation to Temme & Verhoeven (2016), it seems that the experiencer-first preference may only be reflected in higher order processing routines related to the discourse structure which might be indicated towards the end of the spillover region. At least in the final region of the EXPERIENCER-V-FINAL condition, an OS-preference showed up. This indicates that the experiencer-first preference might not originate from structural properties but relates to higher order semantico-pragmatic aspects.[11]

In sum, the results of this experiment support the main predictions of the V2-Reconstruction Hypothesis. However, we also identified an effect that appeared earlier than expected. Clearly, follow-up studies are in need to provided a more detailed picture of the processing routines in relation to the thematic structure.

[11] This assumption is restricted to accusative experiencer objects. Datives experiencers are certainly different and may be structurally exceptional too.

Table 6.27: Output of the LME model for DP1-segment in Experiment 5
`lmer(log.RT~V2.verb*word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+ (1+word.order|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (AUXILIARY SO)	5.7785	0.0975	59.2692	5.8477	0.1054	55.4920
V2.VERB (EXPERIENCER)	0.1126	0.0300	3.7550	0.1210	0.0337	3.5948
V2.VERB (NON-EXPERIENCER)	0.0739	0.0297	2.4896	0.0676	0.0336	2.0129
WORD ORDER (OS)	0.0294	0.0303	0.9696	0.0312	0.0331	0.9416
segment length	0.0262	0.0042	6.2237	0.0234	0.0047	4.9997
trial	0.0000	0.0008	−0.0023	−0.0003	0.0008	−0.3744
EXPERIENCER:OS	−0.0027	0.0426	−0.0636	−0.0172	0.0479	−0.3587
NON-EXPERIENCER:OS	−0.0012	0.0421	−0.0293	0.0086	0.0475	0.1805

Table 6.28: Output of the LME model for high adverb *letztens* in Experiment 5
`lmer(log.RT~V2.verb*word.order+segment.length+trial+ (1+word.order+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER SO)	6.1446	0.0670	91.6861	6.1473	0.0723	85.0240
V2.VERB (AUXILIARY)	−0.0029	0.0179	−0.1637	0.0032	0.0226	0.1424
V2.VERB (NON-EXPERIENCER)	0.0412	0.0204	2.0207	0.0452	0.0259	1.7475
WORD ORDER (OS)	0.0186	0.0244	0.7602	0.0198	0.0287	0.6892
segment length	−0.0029	0.0098	−0.2964	−0.0009	0.0105	−0.0818
trial	−0.0026	0.0004	−6.5404	−0.0031	0.0005	−5.9256
AUXILIARY:OS	0.0169	0.0256	0.6608	0.0200	0.0322	0.6200
NON-EXPERIENCER:OS	−0.0635	0.0293	−2.1677	−0.0602	0.0370	−1.6263

Table 6.29: Output of the LME model for DP2-segment in Experiment 5
`lmer(log.RT~V2.verb*word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER SO)	5.8360	0.0699	83.4730	5.8697	0.0802	73.1514
V2.VERB (NON-EXPERIENCER)	0.0358	0.0284	1.2620	0.0230	0.0333	0.6909
V2.VERB (AUXILIARY)	0.0197	0.0248	0.7945	0.0374	0.0291	1.2851
WORD ORDER (OS)	0.1312	0.0290	4.5269	0.1218	0.0340	3.5815
segment length	0.0243	0.0033	7.4820	0.0230	0.0035	6.4936
trial	−0.0022	0.0007	−3.1249	−0.0022	0.0007	−3.2238
AUXILIARY:OS	−0.0773	0.0407	−1.9004	−0.0603	0.0477	−1.2655
NON-EXPERIENCER:OS	−0.0467	0.0354	−1.3187	−0.0654	0.0415	−1.5739

Table 6.30: Output of the LME model for the low adverb *total* in Experiment 5
`lmer(log.RT~V2.verb*word.order+segment.length+trial+ (1+trial|participant.ID)+(1+word.order|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (NON-EXPERIENCER SO)	6.0754	0.0330	184.1343	6.1037	0.0379	161.1473
V2.VERB (AUXILIARY)	−0.0348	0.0166	−2.1027	−0.0476	0.0209	−2.2758
V2.VERB (EXPERIENCER)	−0.0321	0.0189	−1.7035	−0.0386	0.0238	−1.6226
WORD ORDER (OS)	−0.0080	0.0224	−0.3594	−0.0137	0.0279	−0.4903
segment length	0.0113	0.0024	4.6134	0.0109	0.0030	3.6628
trial	−0.0031	0.0004	−7.2363	−0.0030	0.0006	−5.2831
AUXILIARY:OS	0.0255	0.0232	1.1005	0.0412	0.0293	1.4049
EXPERIENCER:OS	0.0038	0.0269	0.1424	0.0101	0.0340	0.2965

Table 6.31: Output of the LME model for DP2-segment in the V-FINAL condition in Experiment 5
`lmer(log.RT~word.order+segment.length+trial+(1|participant.ID)+ (1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (SO)	5.8881	0.0994	59.2222	5.9624	0.1094	54.5052
WORD ORDER (OS)	0.0679	0.0222	3.0534	0.0487	0.0255	1.9065
segment length	0.0233	0.0039	5.9571	0.0205	0.0044	4.6460
trial	−0.0019	0.0006	−3.0726	−0.0021	0.0007	−2.8609

Table 6.32: Output of the LME model for clause-final verb in Experiment 5
`lmer(log.RT~verb.type+word.order+segment.length+trial+ (1+segment.length|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER SO)	6.0326	0.0583	103.5089	5.9586	0.0721	82.6040
V-TYPE (NON-EXPERIENCER)	0.0388	0.0190	2.0361	0.0531	0.0237	2.2407
WORD ORDER (OS)	0.0437	0.0187	2.3428	0.0342	0.0234	1.4627
segment length	−0.0023	0.0052	−0.4377	0.0066	0.0070	0.9429
trial	−0.0021	0.0004	−5.6392	−0.0025	0.0005	−5.2200
V-TYPE:WORD ORDER	−0.0292	0.0271	−1.0789	−0.0214	0.0340	−0.6315

Table 6.33: Output of the LME model for spillover segment 1 *obwohl* of the V2-subgroup in Experiment 5
`lmer(log.RT~verb.type*word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER SO)	5.9718	0.0412	145.0120	5.9511	0.0446	133.3687
V-TYPE (NON-EXPERIENCER)	0.0310	0.0159	1.9461	0.0371	0.0191	1.9457
WORD ORDER (OS)	0.0103	0.0162	0.6375	0.0273	0.0193	1.4133
segment length	0.0095	0.0059	1.6200	0.0130	0.0064	2.0135
trial	−0.0013	0.0004	−3.1935	−0.0014	0.0005	−2.8916
NON-EXPERIENCER:OS	−0.0232	0.0228	−1.0188	−0.0289	0.0271	−1.0645

Table 6.34: Output of the LME model for spillover segment 2 *die Bienen* of the V2-subgroup in Experiment 5
`lmer(log.RT~verb.type*word.order+segment.length+trial+ (1+segment.length|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER SO)	5.9718	0.0412	145.0120	5.9511	0.0446	133.3687
V-TYPE (NON-EXPERIENCER)	0.0310	0.0159	1.9461	0.0371	0.0191	1.9457
WORD ORDER (OS)	0.0103	0.0162	0.6375	0.0273	0.0193	1.4133
segment length	0.0095	0.0059	1.6200	0.0130	0.0064	2.0135
trial	−0.0013	0.0004	−3.1935	−0.0014	0.0005	−2.8916
NON-EXPERIENCER:OS	−0.0232	0.0228	−1.0188	−0.0289	0.0271	−1.0645

Table 6.35: Output of the LME model for spillover segment 4 *waren* of the V2-subgroup in Experiment 5
`lmer(log.RT~verb.type*word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER OS)	6.0971	0.0388	157.1231	6.0962	0.0433	140.8018
V-TYPE (NON-EXPERIENCER)	−0.0522	0.0216	−2.4194	−0.0383	0.0257	−1.4928
WORD ORDER (SO)	−0.0502	0.0212	−2.3665	−0.0365	0.0254	−1.4393
segment length	0.0096	0.0027	3.5166	0.0105	0.0029	3.5912
trial	−0.0033	0.0006	−5.3642	−0.0031	0.0006	−4.9109
NON-EXPERIENCER:SO	0.0418	0.0298	1.4009	0.0135	0.0356	0.3782

Table 6.36: Output of the LME model for spillover segment 4 *waren* of the V-FINAL-subgroup in Experiment 5
`lmer(log.RT~verb.type*word.order+segment.length+trial+ (1+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER SO)	6.1101	0.0484	126.1970	6.1389	0.0511	120.1603
V-TYPE (NON-EXPERIENCER)	−0.0518	0.0243	−2.1268	−0.0679	0.0290	−2.3380
WORD ORDER (OS)	−0.0030	0.0240	−0.1238	−0.0332	0.0284	−1.1695
segment length	0.0071	0.0024	2.9559	0.0063	0.0027	2.3290
trial	−0.0021	0.0007	−3.1663	−0.0020	0.0008	−2.5204
NON-EXPERIENCER:OS	0.0149	0.0341	0.4363	0.0623	0.0405	1.5365

Table 6.37: Output of the LME model for spillover segment 1+2 *obwohl die Bienen* of the V2-subgroup in Experiment 5
`lmer(log.RT~verb.type*word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER SO)	6.6258	0.0566	117.0060	6.6388	0.0602	110.3324
V-TYPE (NON-EXPERIENCER)	0.0264	0.0155	1.7041	0.0322	0.0176	1.8280
WORD ORDER (OS)	0.0252	0.0156	1.6190	0.0291	0.0177	1.6411
segment length	0.0079	0.0031	2.5330	0.0075	0.0033	2.2926
trial	−0.0016	0.0004	−4.0063	−0.0015	0.0004	−3.5846
NON-EXPERIENCER:OS	−0.0442	0.0220	−2.0100	−0.0512	0.0249	−2.0528

Table 6.38: Output of the LME model for spillover segment 3+4 *ziemlich angriffslustig waren* of the V2-subgroup in Experiment 5
`lmer(log.RT~verb.type+word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (NON-EXPERIENCER SO)	6.5867	0.0607	108.5453	6.5806	0.0668	98.5427
V-TYPE (EXPERIENCER)	0.0418	0.0125	3.3371	0.0376	0.0150	2.5013
WORD ORDER (OS)	0.0255	0.0123	2.0726	0.0251	0.0148	1.6909
segment length	0.0094	0.0017	5.6427	0.0101	0.0019	5.3069
trial	−0.0026	0.0006	−4.7164	−0.0026	0.0006	−4.3485

Table 6.39: Output of the LME model for spillover segment 3+4 *ziemlich angriffslustig waren* of the V-FINAL-subgroup in Experiment 5
`lmer(log.RT~verb.type*word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (NON-EXPERIENCER SO)	6.5969	0.0611	107.8891	6.6318	0.0644	103.0088
V-TYPE (EXPERIENCER)	0.0708	0.0182	3.8937	0.0669	0.0216	3.1030
WORD ORDER (OS)	0.0205	0.0181	1.1335	0.0090	0.0216	0.4146
segment length	0.0090	0.0017	5.3134	0.0085	0.0018	4.6829
trial	−0.0024	0.0006	−4.1899	−0.0024	0.0006	−3.9285
EXPERIENCER:OS	−0.0437	0.0254	−1.7192	−0.0403	0.0302	−1.3333

Table 6.40: Output of the LME model for the DP1-segment with the AGENTIVE controls in Experiment 5
`lmer(log.RT~verb.type*verb.position+segment.length+trial+ (1+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (AGENTIVE V-FINAL)	5.6993	0.1036	55.0359	5.7177	0.0992	57.6183
V-TYPE (EXPERIENCER)	0.0758	0.0460	1.6487	0.0568	0.0514	1.1062
V-TYPE (NON-EXPERIENCER)	0.0603	0.0463	1.3004	0.0471	0.0519	0.9072
V-POSITION (V2)	0.1058	0.0314	3.3680	0.0999	0.0363	2.7484
segment length	0.0271	0.0049	5.5694	0.0270	0.0055	4.8951
trial	−0.0003	0.0007	−0.4045	−0.0003	0.0008	−0.3403
EXPERIENCER:V2	−0.0178	0.0453	−0.3926	0.0215	0.0523	0.4118
NON-EXPERIENCER:V2	−0.0318	0.0454	−0.7005	−0.0298	0.0528	−0.5652

Table 6.41: Output of the LME model for spillover segment 1+2 with the AGENTIVE controls in Experiment 5
`lmer(log.RT~verb.type*verb.position+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (NON-EXPERIENCER V2)	6.6408	0.0501	132.5052	6.6687	0.0529	126.1178
V-TYPE (AGENTIVE)	−0.0303	0.0218	−1.3880	−0.0269	0.0232	−1.1581
V-TYPE (EXPERIENCER)	−0.0362	0.0155	−2.3370	−0.0343	0.0181	−1.8881
V-POSITION (V-FINAL)	−0.0513	0.0157	−3.2578	−0.0428	0.0183	−2.3327
segment length	0.0087	0.0025	3.5065	0.0077	0.0027	2.8311
trial	−0.0018	0.0004	−4.9448	−0.0015	0.0004	−3.8620
AGENTIVE:V-FINAL	0.0357	0.0217	1.6429	0.0135	0.0253	0.5343
EXPERIENCER:V-FINAL	0.0505	0.0222	2.2748	0.0501	0.0259	1.9332

Table 6.42: Output of the LME model for the region consisting of spillover segment 3+4 with the AGENTIVE controls in Experiment 5
`lmer(log.RT~verb.type*verb.position+segment.length+trial+ (1+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (EXPERIENCER V-FINAL)	6.6105	0.0548	120.6926	6.6485	0.0561	118.4244
V-TYPE (NON-EXPERIENCER)	−0.0736	0.0175	−4.2200	−0.0680	0.0206	−3.3047
V-TYPE (AGENTIVE)	−0.0353	0.0260	−1.3614	−0.0397	0.0263	−1.5101
V-POSITION (V2)	−0.0482	0.0171	−2.8266	−0.0403	0.0202	−1.9946
segment length	0.0112	0.0015	7.6682	0.0104	0.0015	6.8627
trial	−0.0022	0.0005	−4.2187	−0.0023	0.0006	−4.1039
NON-EXPERIENCER:V2	0.0525	0.0244	2.1508	0.0374	0.0288	1.2961
AGENTIVE:V2	0.0267	0.0237	1.1238	0.0192	0.0281	0.6832

Table 6.43: Output of the LME model for DP1-segment of the CONFIGURATIONAL controls in Experiment 5
`lmer(log.RT~verb.position+word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (V2 OS)	5.4138	0.3270	16.5549	5.6271	0.3468	16.2235
V-POSITION (V-FINAL)	−0.0649	0.0278	−2.3378	−0.0693	0.0305	−2.2700
WORD ORDER (SO)	−0.0932	0.0287	−3.2434	−0.0932	0.0328	−2.8407
segment length	0.0531	0.0190	2.8041	0.0422	0.0203	2.0765
trial	−0.0001	0.0012	−0.0918	−0.0002	0.0013	−0.1512

Table 6.44: Output of the LME model for the high adverb segment of the CONFIGURATIONAL controls in Experiment 5
`lmer(log.RT~verb.position+word.order+segment.length+trial+ (1|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (V2 OS)	6.0328	0.0387	156.0507	6.0731	0.0471	129.0500
V-POSITION (V-FINAL)	0.0695	0.0257	2.7019	0.0762	0.0343	2.2178
WORD ORDER (SO)	0.0729	0.0258	2.8287	0.0732	0.0344	2.1262
segment length	0.0058	0.0038	1.5277	0.0022	0.0051	0.4387
trial	−0.0018	0.0005	−3.4285	−0.0011	0.0007	−1.6399
V-FINAL:SO	−0.0616	0.0366	−1.6816	−0.0610	0.0487	−1.2527

Table 6.45: Output of the LME model for DP2-segment of the CONFIGURATIONAL controls in Experiment 5
`lmer(log.RT~verb.position+word.order+segment.length+trial+ (1|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (V2 SO)	6.4494	0.2597	24.8315	6.1417	0.3272	18.7707
V-POSITION (V-FINAL)	0.0874	0.0229	3.8157	0.0673	0.0294	2.2930
WORD ORDER (OS)	0.0230	0.0245	0.9384	0.0315	0.0315	1.0017
segment length	−0.0138	0.0146	−0.9449	0.0037	0.0185	0.2000
trial	−0.0011	0.0007	−1.7069	−0.0019	0.0008	−2.2551

Table 6.46: Output of the LME model for spillover segment 1 of the CONFIGURATIONAL controls in Experiment 5
`lmer(log.RT~verb.position+word.order+segment.length+trial+ (1+segment.length+trial|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (V2 SO)	5.9005	0.0520	113.3904	5.9042	0.0578	102.1478
V-POSITION (V-FINAL)	−0.0499	0.0158	−3.1641	−0.0482	0.0190	−2.5418
WORD ORDER (OS)	0.0260	0.0157	1.6510	0.0096	0.0190	0.5060
segment length	0.0260	0.0064	4.0859	0.0284	0.0071	3.9850
trial	−0.0007	0.0005	−1.2844	−0.0006	0.0006	−0.9003

Table 6.47: Output of the LME model for spillover segment 2 of the CONFIGURATIONAL controls in Experiment 5
`lmer(log.RT~verb.position*word.order+segment.length+trial+ (1|participant.ID)+(1|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (V2 SO)	5.8149	0.1486	39.1347	5.7732	0.1623	35.5796
V-POSITION (V-FINAL)	0.0564	0.0255	2.2100	0.0548	0.0313	1.7496
WORD ORDER (OS)	0.0462	0.0255	1.8131	0.0303	0.0313	0.9657
segment length	0.0197	0.0123	1.5932	0.0241	0.0135	1.7800
trial	−0.0010	0.0005	−1.8773	−0.0010	0.0006	−1.5344
V-FINAL:OS	−0.0927	0.0361	−2.5702	−0.0663	0.0443	−1.4977

6.5 Summary of the experimental investigations

In this chapter, I presented four self-paced reading experiments designed to test the prediction of the V2-Reconstruction Hypothesis about the processing of the finite verb in on-line sentence comprehension. Experiment 2 used the verbal NPI *brauchen* 'need to' whose grammaticality/interpretability hinges on a proper NPI-licensor. The results indicate that the NPI-verb in V2-position triggers prolonged reading times at the potential base position of the finite verb if this position is not in the scope of an NPI-licensor. This matches the predictions of the V2-Reconstruction Hypothesis, namely that the finite verb is automatically reconstructed into potential base positions, comparable to filler-gap parsing. Experiment 3 was a follow-up study designed to diagnose whether the NPI-violation effect of experiment 2 was really tied to the base position of the finite verb, or whether the effect was actually related to the base position of the negation, which was almost adjacent to the one of the verb. Although the results are less pronounced than in experiment 2, they clearly favor the V2-Reconstruction Hypothesis over the alternative hypothesis.

Experiment 4 applied a similar logic as the preceding experiments. Two verb classes were contrasted in the V2-position, which selected bare infinitives and *zu*-infinitives respectively. The first potential reconstruction site followed a *zu*-infinitive. In line with the V2-Reconstruction Hypothesis, the results showed longer reading times for the matrix verb whose selection requirement are not satisfied at this point. This indicates that the finite verb is automatically reconstructed into a potential base position before the selection requirement are evaluated. This was supported by the observation that the selection mismatch effect was directly preceded by another effect, which probably reflects lexical reactivation.

Experiment 5 was intended to tap into the verb-related argument processing by contrasting verb classes with different thematic roles and corresponding argument-order preferences. The main result showed a modulation of the subject-first preference as a function of the V2-verb at the position directly preceding the reconstruction site. Additionally, the results also included potential verb-related effects at earlier points which indicate that thematic processing might starts prior to the reconstruction of the finite verb.

In sum, this chapter presented a series of experiments which investigated three properties which depend on the interpretation of the lexical content of a verb in the V2-position and tested whether their processing correlates can be diagnosed at a distant position in the sentence as predicted by the V2-Reconstruction Hypothesis. The expectations have been met for polarity-sensitive properties, which trigger an immediate response to the licensing requirement at the reconstruction site. The predictions could also be confirmed for the evaluation of selection requirements of the V2-verb, although these seem to be evaluated only shortly after lexical reactivation took place. Concerning the evaluation of thematic structure of the V2-verb, the result are compatible with the V2-Reconstruction Hypothesis. However, the result are less clear-cut than for the other two phenomena. This is not very surprising considering that argument order does not induce strict ungrammaticality but only preferences, which also strongly interact with discourse-properties. Taken together, the experiments showed that the V2-Reconstruction Hypothesis yields very accurate predictions concerning the temporal locus at which the lexical information of the V2-verb is evaluated during the on-line processing of V2-clauses in German.

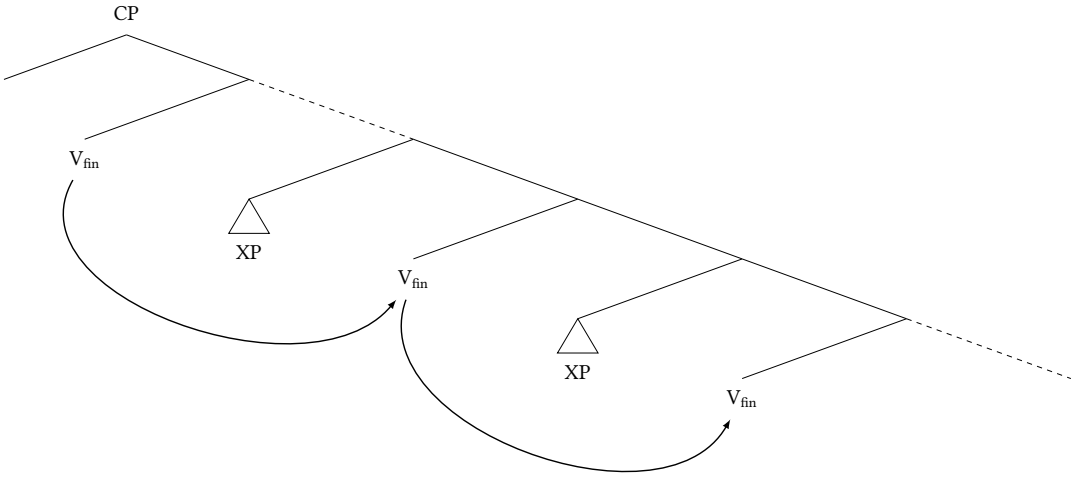
7 Peculiarities of processing V2-clauses: Specifying the V2-Reconstruction Hypothesis

Based on the three previous chapters about the general properties of the processing device (Chapter 4), the review of the literature on sentence processing in German (Chapter 5), and the experimental results (Chapter 6), this chapter provides a more elaborated inspection of the processing of V2-clauses under the V2-Reconstruction Hypothesis. I will discuss how the verbs in V2-position are processed and elaborate on consequences of the relation of grammar and processing. I will begin by discussing three important issues of V2-parsing under the V2-Reconstruction Hypothesis: the special status of subject-initial clauses, the point at which the interpretation of the reconstructed verb will be initiated, and a comparison of two different ways of implementing phrase structure buildup with verb reconstruction, i. e. cascading structures vs. structure insertion. The second part then evaluates the assumed proportions of the parsing mechanism by contrasting V2-structures with English head-initial structures. Temporary constituency, diagnosed by Right Node Raising constructions, indicates that V-initial parsing builds cascading structures, whereas V2-parsing uses the insertion strategy. Furthermore, I will show that the base position of the finite verb divides the German clause into two areas with distinct interpretation potentials. Finally, I will present a speculative idea about the cross-linguistic impact of generalized application of reconstruction as an explanation for unattested phrase structure patterns.

7.1 Properties of V2-processing

Following Haider (2012), I assume that verbal heads in German license only to the left. Based on that, I conclude that the processor may only integrate arguments and adjuncts on the left of the verb, and cannot generate predictions pointing to the right. Consequently in a left-to-right structure building process the verb has to be lowered successively, as in (1), to license and interpret complements and adjuncts.

(1) Successive lowering of the finite verb (to be revised)



The discussion in the following sections will reveal that the successive lowering of the verb is not the only possibility. In fact, I will show that an alternative structure building procedure is empirically more accurate. Before I turn to the structure building mechanism, I will discuss two prerequisites, namely the special status of subject-initial V2-clauses and the effect of immediate access of the meaning of the reconstructed verb.

7.1.1 The special status of subject-initial V2-clauses

Subject-initial V2-clauses constitute a special case of V2-clauses. I assume that these are processed more efficiently than non-subject-initial clauses, see the discussion of (non-subject) XP-fronting in Section 5.2. The reason for the processing advantage is that subject-initial V2-clauses can dispense with at least one reordering step in contrast to non-subject-initial V2-clauses. Subject-initial V2-clauses are (partially) string identical to the base order of the respective elements in the middle field (VP). This can be illustrated most clearly with an intransitive predicate, as in (2). The subject-initial V2-clause in (2a) is string-identical to its V-final counterpart in (2b), as long as no further modifying material is present, such as the adverbial *seit zwei Stunden* 'for two hours' in brackets. If additional material is present, the verb has to be rearranged with respect to this material and has to be reconstructed into the clause-final position. However, the order of subject and verb remains the same, in contrast to non-subject-initial clauses, as in (2c). Here the preverbal constituent and the finite verb have to be rearranged with respect to the subject.

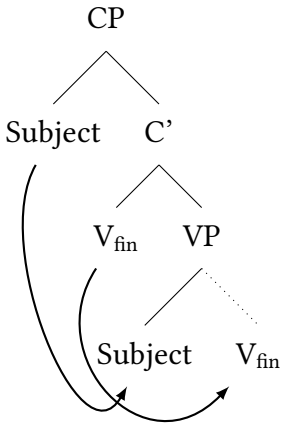
(2) a. Der Junge schläft (seit zwei Stunden).
the boy sleeps since two hours

b. … dass der Junge (seit zwei Stunden) schläft.
that the boy since two hours sleeps

c. [Seit zwei Stunden]$_1$ schläft$_2$ der Junge t_1 t_2.
since two hours sleeps the boy
'The boy sleeps for two hours.'

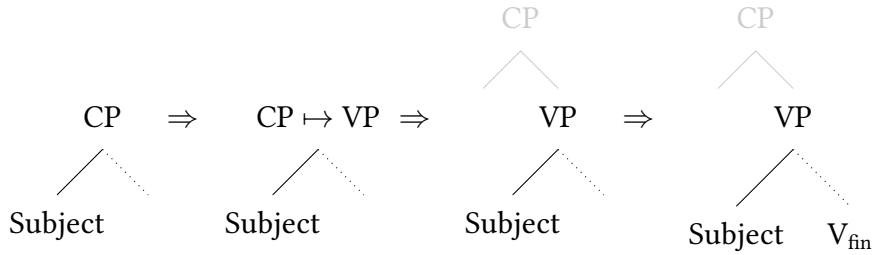
To recapitulate, the special property of subject-initial V2-clauses is that the order of the subject and the finite verb remains stable during the parse. Therefore, there is no need to assume that the processor induces a reordering of the subject and the finite verb in a subject-initial clause. The result of such an operation would be string-identical to the initial sequence, as shown in (3).

(3) String-identical reconstruction of subject and finite verb



Instead, I assume the following for subject-initial V2-parsing: When the parser encounters a clause-initial nominative phrase, it immediately induces a procedure to which I will refer as *projection matching* (based on Haider 1988 who proposed this based solely on theoretical arguments). Thereby, the parser relabels the subject in Spec-CP as a Spec-VP element. The subsequent finite verb will consequently be integrated as the head of the VP. The procedure is illustrated in (4).

(4) Projection matching operation



The projection matching procedure presupposes that the hierarchical layer receives labels by the processor. There is, however, no a priori reason to assume this. Assuming that the processor constructs unlabeled hierarchies, there is not even a need for relabeling. Subject-initial clauses therefore allow a more efficient processing, such that more properties can be assigned on-line and less properties have to be delayed.

This peculiarity might explain the subject-object asymmetry for the unstressed pronoun *es* in German (Kathol 1990, Travis 1991) that is observable under certain conditions (see Frey 2006b, Meinunger 2007). Only as a subject, the pronoun does not have to be reordered but can be integrated into the VP. It is unclear whether the processing advantage generalizes to other (pragmatically) unmarked prefield elements that are assumed to be fronted by *formal movement* (Frey 2006a). However, the review of the experimental results in Section 5.3.1 and the results of Experiment 5 indicated that initial objects of experiencer object verbs induce local reordering effects although theses orderings are (pragmatically) unmarked. To my knowledge, no study has investigated the processing differences of V2-clauses with initial subjects vs. sentence adverbs or frame setting adverbs. For now, I will assume that the special status for processing V2-clauses is restricted to initial subjects.

7.1.2 Aspects of (immediate) interpretation

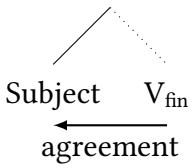
Based on the experimental evidence reviewed in Section 5.3 and Chapter 6, I assume that the processor does not access the information about the verb frame immediately at the V2-position. Consequently, the processor simply does not "know" whether the verb is intransitive, as in (2) or not. This will be evaluated only after the integration of the subject and a (partial) interpretation. Therefore, the reconstruction of the finite verb has to begin immediately after the encounter of the subject. This assumption is supported by the findings of Schlesewsky et al. (2000), who report that a verb which immediately follows a case ambiguous *wh*-element which does not agree in number, as in (5a), results in longer reading times on the verb and subsequent segments, in contrast to a number matching verb, as in (5b). Crucially, the effect emerges before the disambiguating second noun phrase has been encountered. This indicates that the first noun phrase is immediately integrated as the clausal subject and the verb is immediately integrated as head of the VP, either by projection matching as in (6a) or by reconstruction as in (6b). Thus, whereas the verb does not induce an input-predicting process, all potential arguments that appear to the right of the verb will be integrated and (partially) interpreted as early as possible.

(5) a. Object-initial
Welche Frauen sah der Mann am Freitag?
[which woman].PL saw.SG [the man]NOM on Friday
'which woman did the man see on Friday?'

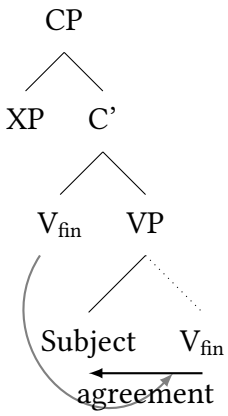
b. Subject-initial
Welche Frauen sahen den Mann am Freitag?
[which woman].PL saw.PL [the man]ACC on Friday
'which woman saw the man on Friday?'

(Schlesewsky et al. 2000: 77)

(6) a.



b.



This immediate response to temporary agreement mismatches, however, leaves open whether the processor only validates morphosyntactic features or also initiates a full interpretation process. There is supporting evidence for the latter, namely that the processor starts an integration, linking and interpretation process immediately after inserting a phrase into the current phrase structure. Results indicating immediate interpretation processes have been reported by Friederici & Frisch (2000). They investigate three types of violation in V2-clauses and V-final clauses, as illustrated in (7).

(7) a. Well-formed
Heute ⟨besuchte⟩ der Cousin den Geiger im Krankenhaus ⟨besuchte⟩.
today visited [the cousin]NOM [the violinist]ACC [in the hospital] visited
'Today, the cousin visited the violinist in the hospital.'

b. Semantic violation
*Heute ⟨beizte⟩ der Cousin den Geiger am Mittag ⟨beizte⟩.
today stained [the Cousin]NOM [the violinist]ACC at noon stained

c. Number of argument violation
*Heute ⟨trödelte⟩ der Cousin den Geiger am Aufzug ⟨trödelte⟩.
today dawdled [the cousin]NOM [the violinist]ACC [at the lift] dawdled

d. Type of argument violation (case marking)
*Heute ⟨besuchte⟩ der Cousin dem Geiger im Krankenhaus ⟨besuchte⟩.
today visited [the Cousin]NOM [the violinist]DAT [in the hospital] visited
(Friederici & Frisch 2000: 481, 490)

In verb-final clauses, the responses to the violations in (7) were detected at the clause-final verb, consisting of an early negativity (N400/left lateralized negativity) and a later positivity

(P600). The negative components are interpreted as a semantic or syntactic violation, followed by a repair process, which is indicated by the positive component. In V2-clauses, however, the components which emerged immediately at the second NP, showed more violation-specific variation. The semantic violation (7b) only evoked an N400, which is a typical response to semantic violations. I assume that the verb is reconstructed, the syntactic structure is built and the whole VP is pushed further to interpretation where the violation becomes evident. The number-of-argument violation in (7c) confronts the processor with a surplus argument for an intransitive verb. After the syntactic integration of the surplus element, the interpretation procedure will result in a violation of the argument structure or the modifier structure. This results in a N400, followed by structural reanalyses, reflected by the P600. The type of argument violation in (7d) does not show an immediate negative component in the V2-clauses because the clause is not necessarily ungrammatical at this point but there exist acceptable continuations[1]. The P600 therefore might only reflect structural delay without semantic anomaly. While Friederici & Frisch (2000) assume that, in V2-clauses, the arguments are checked against the predictions of the verbs, I assume the opposite: In V2-clauses, the processor tries to complete the clause after every potential argument and pushes it to interpretation. In V-final clauses, the argument structure creates a prediction for the verb. Because the verb distinctively marks the end of the clause, the content will automatically be pushed to interpretation. There, all mismatches result in immediate negativities followed by a repair mechanism, which is indicated by positivities.

I summarize that the processor integrates all potential arguments to the left of the reconstructed verb as soon as possible.

7.1.3 Structural build-up and verb reconstruction: Cascades vs. insertion

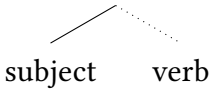
In this section, I will take a closer look at the mechanism of reconstructing the finite verb. To set the scene for this discussion, I make two basic assumptions: First, in non-subject-initial clauses, the preverbal phrase will be held in working memory for later integration, which is in accordance with filler-gap processing. Second, the finite verb will be rearranged with respect to the subject. This yields the initial situation for regular V2-parsing, as it is illustrated in (8). This configuration is presumed for subject-initial and non-subject-initial clauses alike, except that, in the latter, the integration of the prefield element is pending until the gap site.

[1] These continuations include benefactive constructions as in (i) and dative possesive structures as in (ii), which are common in many German variants.

(i) *Heute besuchte der Cousin dem Geiger zuliebe eine Freundin im Krankenhaus.*
today visited [the Cousin]NOM [[the violinist]DAT for the sake] a friend in the hospital
'Today visited the cousin a friend in the hospital for the sake of the violinist.'

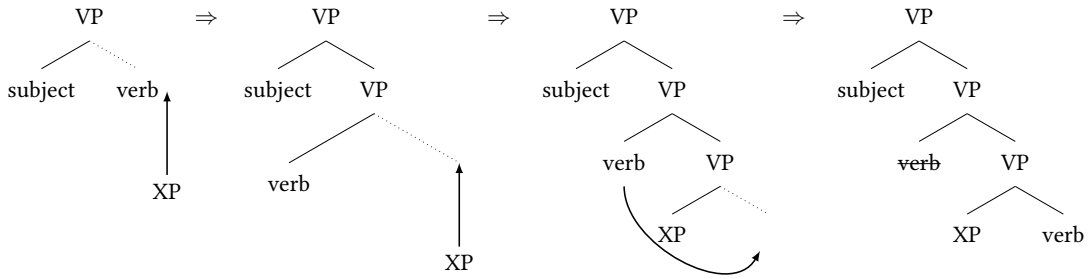
(ii) *Heute besuchte der Cousin dem Geiger seine Frau im Krankenhaus.*
today visited [the Cousin]NOM [[the violinist]DAT his wife] in the hospital
'Today visited the cousin the violinist's wife in the hospital.'

(8)



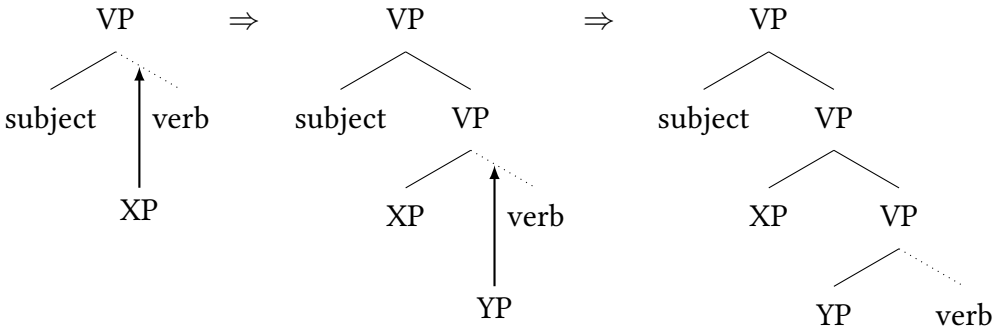
I will review two different strategies of integrating new strings into the structure. The first strategy extends the structure cyclically to the right, which results in a cascading structure with multiple copies of the verb, as shown in (9). This strategy is assumed by Phillips (1996) for the left-to-right derivation of English sentences (based on Pesetsky 1995).

(9) V2-parsing: cascading structure



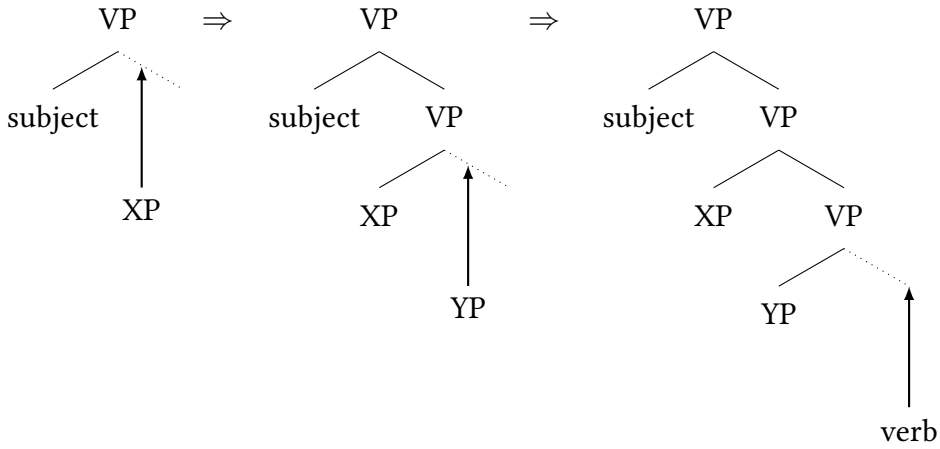
The second strategy extends the structure by inserting incoming parts before the verb, as in (10). The process resembles the mechanisms of the tree adjoining grammar formalism (Rambow & Joshi 1994: 274-275).

(10) V2-parsing: insertion strategy



This second strategy is basically identical to the parsing of V-final structures, as illustrated in (11).

(11) V-final parsing



V2-parsing and V-final parsing result in identical phrase structure configurations of the argument structure: In V2-parsing the most deeply embedded element of the clause, the finite verb, is overtly present while the structure is extended with every input item. Structure building of V-final clauses is identical, except that the most deeply embedded element is typically the last input item. Furthermore, clauses may contain more than one verbal element and all but one are non-finite. In OV-languages such as German and Dutch, the verbal elements form a verb cluster which has two important properties: It is compact, i. e. no non-verbal elements, such as adjuncts, intervene between the verbal elements of the cluster (Haider 2010: 274–282). Second, the order of the elements in the cluster may vary (Haider 2010: 286–292). German exhibits a head-final base order, i. e. the selecting verb follows the head of the VP it selects (its complements), as in (12a). Dutch and Swiss German, in contrast, linearize verbs in verb clusters preferably in the inverted order (Bresnan et al. 1982, Shieber 1985, Bach et al. 1986). Although German does not allow the fully inverted order, it allows variants in which the finite auxiliary is semi or fully shifted to the left, as in (12b) and (12c).

(12) a. … dass er uns nicht mitfahren lassen *hat*.
that he us not ride let has
'… that he didn't let us join the ride.'

b. … dass er uns nicht mitfahren *hat* lassen.
that he us not ride has let

c. … dass er uns nicht *hat* mitfahren lassen.
that he us not has ride let

Irrespective of the linear order, the hierarchical order (scope) of the verbal elements must be identical in all permutations of (12). Consequently, the processor must be able to map non-canonical orders onto an interpretable hierarchy and simultaneously resolve crossing dependencies (see Culicover 2014 for a detailed discussion of verb clusters in Continental West Germanic).

The comparison of cascades in (9) and insertion in (10) shows that the differences between the resulting structures are rather subtle. The main difference is that the cascading structure

exhibits copies of the finite verb in VP-internal positions (*copy and paste*).[2] If such copies have any noticeable effect, they should only appear in V2-clauses but not in V-final clauses.[3] In the following section, I will discuss three aspects that provide arguments in favor of the insertion strategy and against a cascading structure building process in German.

7.2 Consequences and diagnostics for V2-parsing

In this section, I evaluate the predictions of the structure building mechanism for V2-parsing that I discussed in the previous section, *cascades* vs. *insertion*. The first argument builds on implications about the (temporary) constituency which we can draw from Right Node Raising constructions: Intermediate copies of the finite verb should take part in temporary constituents parallel to cascading phrase structure constructions in English, a prediction that is not borne out. The second and third argument concentrate on the distinctive properties of the areas preceding and following the base position of the verb. I will specify an interpretation domain and discuss its relation to extraposition patterns in German. In the final subsection, I will generalize the idea of reconstruction and relate it to cross-linguistically unattested/excluded phrase structure configurations.

7.2.1 Temporary constituency: Right Node Raising with the exclusion of C

In this section, I motivate why I assume the *insertion* strategy for German, rather than the *cascade* strategy. One diagnostic that taps into incremental structure building processes is the identification of temporary constituency, as proposed by Phillips (2003) and introduced in Section 4.2.3. In a nutshell, the two rightmost constituents of any substring form a temporary constituent. Because of this, such a temporary constituent can be coordinated whereas it may not pass other constituent tests, such as topicalization. The examples in (13)–(15) illustrate that, in English, the two constituents at the right edge of a partial phrase marker form a temporary constituent which may serve as a conjunct of a coordination.

(13) a. [Wallace will]
b. [Wallace will] and [Wendolene probably won't] give Gromit crackers before breakfast.
(Phillips 2003: 47)

[2] If the lowering process doesn't leave copies behind, but applies a *cut and paste* strategy, I cannot see in which way it differs from the insertion strategy and take it to be identical with it.

[3] Theoretically, it would be possible to assume that in V-final structures an empty V-head is anticipated which will be lowered with any incoming element until the V-head is encountered. However, I cannot think of any supporting evidence for such an assumption nor of any desirable consequences.

(14) a. [Wallace [will give]]
b. [Wallace will give] and [Wendolene will send] some crackers to Gromit for his birthday.
c. Wallace [will design] but [won't actually build] an exciting new invention for his dog's birthday.
(Phillips 2003: 48)

(15) a. [Wallace [will [give Gromit]]]
b. [Wallace will give Gromit] and [Wendolene will give Preston] a shining new collar for walking about town.
c. Wallace [will give Gromit] and [(will) send Preston] a shining new collar for walking about town.
(Phillips 2003: 48)

Coordinations such as (13)–(15) are known as *Right Node Raising* constructions. These differ from "simple" coordinations in the following respects: In a simple coordination, such as in (16a), the coordinated NPs yield a complex element that functions like a plural NP, in the same way as *the fairies* in (16b).

(16) a. [Paul and Mary] are walking through the prairie.
b. [The fairies] are walking through the prairie.

In Right Node Raising construction, the conjuncts are incomplete, e. g. exhibit an unfilled argument slot, such as the object slots in (17a). This missing part, which usually appears right peripheral, here *the prairie*, is connected to both conjuncts, i. e. the conjuncts "share" one continuation.[4] Constructions of this sort pose a serious problem for classic phrase structure theories, due to the non-monotonic dominance relations. One popular class of accounts assume an ellipsis analysis as indicated in (17b), in which the "shared" material is elided in the first conjunct. In contrast, I will assume an approach in which the right peripheral material is really *shared*, as will be illustrated below. For a brief overview of Right Node Raising analyses see Sabbagh (2014), and Citko (2017) for a more extensive one.[5]

(17) a. [[Mary loves $___1$] and [the fairy detests $___1$]] [the prairie]$_1$.
b. [Mary loves ~~the prairie~~] and [the fairy detests the prairie].

[4] The term *Right Node Raising*, introduced by Postal (1974: 125-129), refers to a specific type of analysis which assumes an accross-the-board extraction of the right peripheral continuation with subsequent adjunction to the right of the coordinated phrase.

[5] It should be noted that in Right Node Raising constructions neither the contrasted nor the shared material have to be constituents in classical phrase structure analysis, as noted in Hartmann (2000: 55–60). Thanks to Sophie Repp for pointing that out.

At first glance, German subject-initial clauses show a pattern similar to the English examples in (13)–(15). The examples in (18) seem to indicate that the subject and the finite verb build a temporary constituent.[6]

(18) a. [Ich werde] und [du wirst nicht] gewinnen.
I will and you will not win
'I will win and you won't win.'

b. [Peter muss] und [Maria darf] zu Hause bleiben.
Peter must and Maria may at home stay
'Peter has to stay at home and Maria is allowed to stay at home.'

Parallel to English, strings of VP-internal material, such as subject and indirect object may also form temporary constituents which allow coordination but resist topicalization because only one (phrasal) constituent may move to the prefield. This is illustrated by the acceptable coordinations in (19a) and (20a), and the corresponding ungrammatical topicalizations in (19b) and (20b). Note that, in (20), even an adjunct is part of the temporary constituent string.

(19) a. Dann hat [die Sängerin ihrem Bruder] und [die Ärztin ihrem Vater] das Geschenk
then has the singer her brother and the physician her father his present
überreicht.
hand over
'Then singer gave her brother and the physician gave her father the present.'

b. *[Die Sängerin ihrem Bruder]$_1$ hat t_1 das Geschenk überreicht
the singer her brother has the present hand over

(20) a. Dann hat [die Sängerin ihrem Bruder im Park] und [die Ärztin ihrem Vater
then has the singer her brother in the park and the physician her father
im Garten] das Geschenk überreicht.
in the garden his present hand over
'Then singer gave her brother the present in the park and the physician gave her father the present in the garden.'

b. *[Die Sängerin ihrem Bruder im Park]$_1$ hat t_1 das Geschenk überreicht.
the singer her brother in the park has the present hand over

Closer inspection, however, reveals significant differences between German and English, and indicates that the finite verb in V2-position is not part of a temporary constituent. Subject-initial V2-clauses constitute a special case because they are temporarily string identical with V-final clauses, see Section 7.1.1. I assume that this is the reason why it is possible to coordinate the subject-verb string in (21) with the exclusion of other VP-internal material.

[6]Unfortunately, no alternative constituency diagnostics can be conducted for the subject-verb string in German. Clearly this string cannot be moved without violating the V2-constraint because it contains the finite verb. The same logic applies to deletion diagnostics. Substitution by an alternative (pronominal) element is also not an option.

In (22), the subject follows the finite verb. The resulting verb-subject string cannot be coordinated, which indicates that it does not form a temporary constituent.[7] These verb-subject strings can only be coordinated as elliptical clauses (gapping), as in (23).[8]

(21) a. [Ich werde] und du wirst nicht bezahlen.
I will and you will not pay
'I will and you won't pay.'

b. [Ich koche] und du isst Apfelmus.
I cook and you eat apple sauce
'I cook and you eat the apple sauce.'

c. [Peter darf] und Julia muss Hausaufgaben machen.
Peter may and July must homework make
'Peter may and July must do the homework.'

(22) a. * Dann [werde ich] und wirst du nicht bezahlen.
then will I and will you not pay

b. * Dann [koche ich] und isst du Apfelmus.
then cook I and eat you apple sauce

c. * Dann [darf Peter] und muss Julia Hausaufgaben machen.
then may Peter and must Julia homework make

(23) a. Dann werde ich bezahlen und du nicht.
then will I pay and you not
'Then I will pay and you won't.'

b. Dann koche ich Apfelmus und du isst es.
then cook I apple sauce and you eat it
'Then I cook apple sauce and you will eat it.'

[7] Sophie Repp (p. c.) pointed out that there exist acceptable variants of the examples in (22), such as (i).

(i) a. *Zur Belohnung koche ich und isst du superleckeres Apfelmus.*
for reward cook I and eat you scrummy apple sauce

b. *Zu allem Überfluss besteigt unsere Katze und beschnüffelt unser Hund in diesem Moment auch noch eine der überaus wertvollen Vasen neben der Vitrine links hinten an der Wand.*
to make matters worse climbs our cat and noses at our dog in this moment even also on of the extremely precious vases next to the cabinet left rear at the wall

[8] Josef Bayer provided the example in (i) which I and Max Bonke (p. c.) consider considerably marked. As illustrated by the indices, I assume that the topicalized object is inserted in both coordinated clauses, which each constitute *comments* on the *aboutness topic* in the sense of Krifka (2007). I further assume that the markedness is the result from such a construal being interpretable but only analyzable by "bending" syntactic rules.

(i) ?? *[Diesen Hasen]$_1$ [schoss$_2$ der Jäger gestern t_1] und [wird$_3$ seine Frau morgen t_1 zubereiten] t_3.*
this hare shot the hunter yesterday and will his wife tomorrow prepare
'This hare, the hunter shot today and his will prepare it tomorrow.'

c. Dann darf Peter Hausaufgaben machen und Julia muss (sie machen).
then may Peter homework make and Julia must them make
'Then Peter may do the homework and Julia must.'

The same effect has been observed for other constituents that follow the finite verb, such as objects and adjuncts. They too do not form a temporary constituent with the finite verb, as shown in (24). In cascading structures, temporary constituents of this sort are expected, and actually attested, as the English sentences in (14) and (15) illustrate. The impossibility of such coordinations in German indicates that no intermediate copies of the finite verb are present in the phrase structure analysis.[9]

(24) a. * Der Professor [wird das Buch] und wird die Zeichnung nicht verkaufen.
the professor will the book and will the drawing not sell

b. * Die Lehrlinge [reinigen heute] und verarbeiten morgen die Fische.
the apprentices clean today and process tomorrow the fish

c. * Der Dieb [stahl der Gräfin] und schenkte den Kindern die Diamanten.
the thief stole the countess and gave the children the diamonds

d. * Peter [darf Schokolade] und muss grünen Salat einkaufen.
Peter may chocolate and must green lettuce buy

Additionally, if a string is coordinated that encompasses the finite verb, the finite verb itself does not seem to be part of the conjunct because it can be left out of the second conjunct, as shown in (25).

(25) a. [Der Professor |hat| einen Studenten] und [der Lehrer einen Schüler] zu dem
the professor has a student and the teacher a pupil to the
Vernetzungstreffen geschickt.
networking meeting sent
'The professor sent a student and the teacher sent a pupil to the network meeting.'

b. [Der Professor |hat| einen Studenten zu der Konferenz] und [der Lehrer einen
the professor has a student to the conference and the teacher a
Schüler zu dem Vernetzungstreffen] geschickt.
pupil to the network meeting sent
'The professor sent a student to the conference and the teacher sent a pupil to the network meeting.'

[9] Sophie Repp (p. c.) pointed out that the structures in (24) can be changed to acceptable variants, as in (i).

(i) a. *Die Lehrlinge reinigen heute und verarbeiten morgen die Fische, die der alte Kutter heute morgen mitgebracht hat.*
the apprentices clean today and process tomorrow the fish REL *the old cutter today morning brought have*

b. *Peter darf zwar Schokolade, muss aber auch grünen Salat einkaufen.*
Peter may PRT *chocolate must however also green salad buy*

c. [Die Nachbarin |hat| ihrem Sohn eine Sonnenbrille] und [Herr Müller seiner
the neighbor has her son a sunglasses and Mr. Müller his
Tochter eine Gitarre] geschenkt.
daughter a guitar donated
'The neighbor has donated her son sunglasses and Mr. Müller donated his daughter a guitar.'

The exclusion of the finite verb from temporary constituents matches the predictions of the insertion strategy. In particular, it follows from the assumption that the finite verb is initially reconstructed as clause-final element. As a consequence, the finite verb does not take part in the intermediate structure building and is therefore not part of temporary constituents. As expected, we observe that V-final embedded clauses exhibit the same coordination structure, as in (25), which is shown in (26).

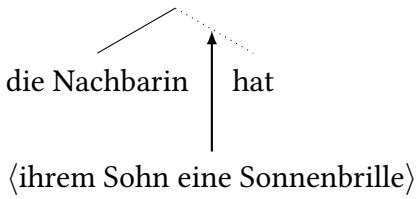
(26) a. … dass [der Professor einen Studenten] und [der Lehrer einen Schüler] zu dem
that the professor a student and the teacher a pupil to the
Vernetzungstreffen geschickt hat.
networking meeting sent has
'… that the professor sent a student and the teacher sent a pupil to the network meeting.'

b. … dass [der Professor einen Studenten zu der Konferenz] und [der Lehrer einen
that the professor a student to the conference and the teacher a
Schüler zu dem Vernetzungstreffen] geschickt hat.
pupil to the network meeting sent has
'… that the professor sent a student to the conference and the teacher sent a pupil to the network meeting.'

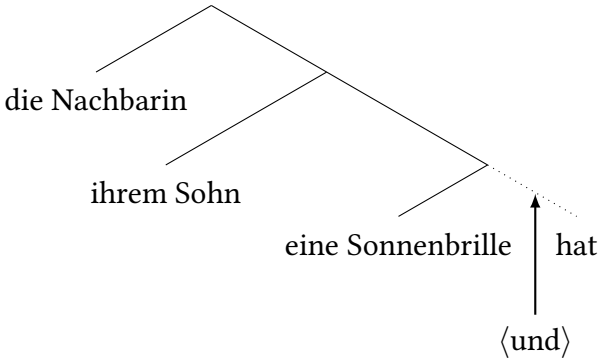
c. … dass [die Nachbarin ihrem Sohn eine Sonnenbrille] und [Herr Müller seiner
that the neighbor her son a sunglasses and Mr. Müller his
Tochter eine Gitarre] geschenkt hat.
daughter a guitar donated has
'… that the neighbor has donated her son sunglasses and Mr. Müller donated his daughter a guitar.'

I therefore assume that, in sentences like (25), the finite verb is suspended from clause-internal structure building. For those sentences, I assume a Right Node Raising analysis like as proposed in Phillips (2003: 65) i. e. with a multiple dominance account for structure sharing (Moltman 1992, de Vries 2009), as illustrated in (27).

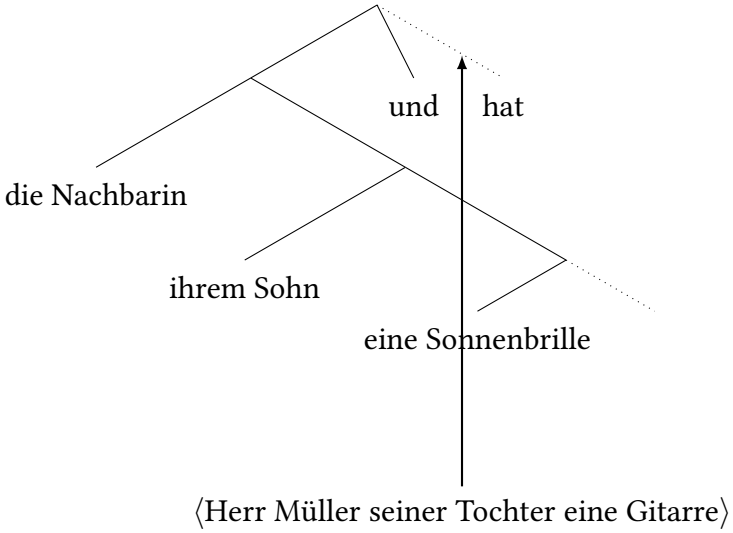
(27) a.



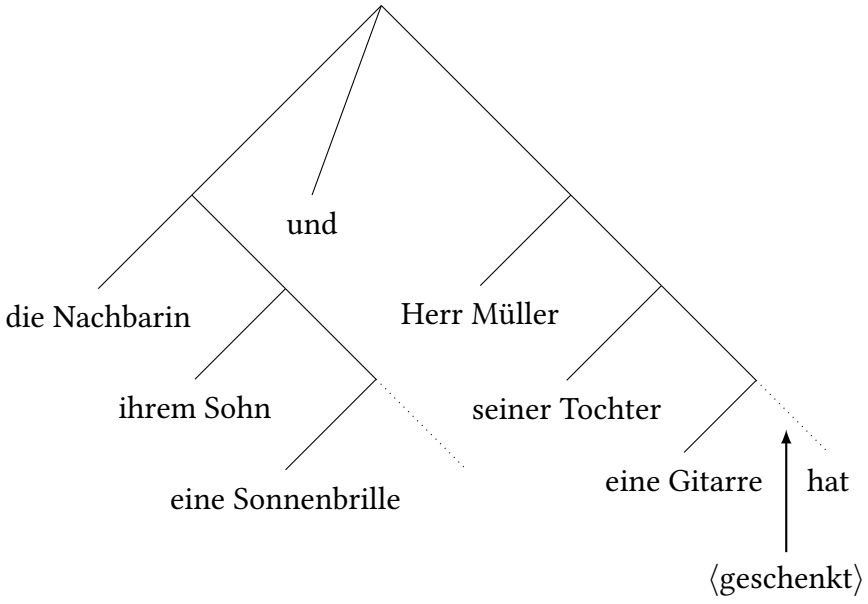
b.


die Nachbarin
ihrem Sohn
eine Sonnenbrille
hat
⟨und⟩

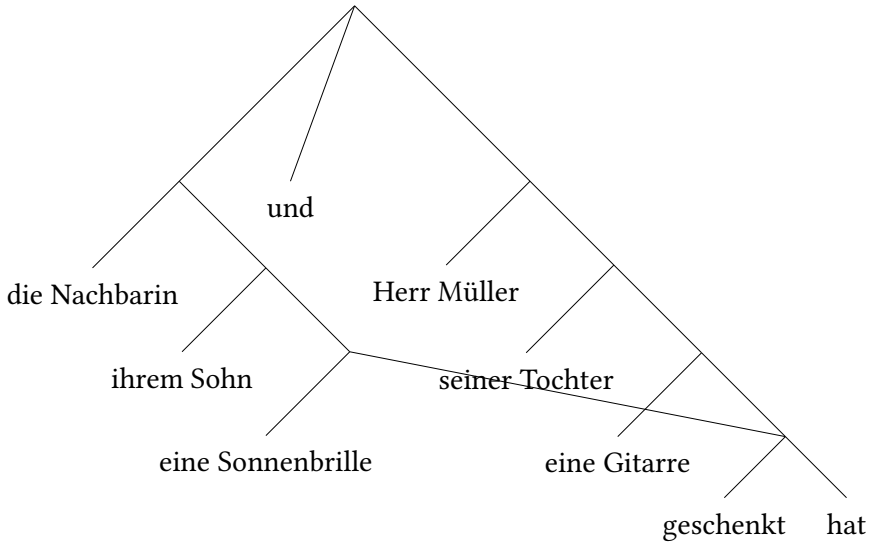
c.


und
hat
die Nachbarin
ihrem Sohn
eine Sonnenbrille
⟨Herr Müller seiner Tochter eine Gitarre⟩

d.


und
die Nachbarin
Herr Müller
ihrem Sohn
seiner Tochter
eine Sonnenbrille
eine Gitarre
hat
⟨geschenkt⟩

e.



It is crucial for my argument that the examples above are analyzed as instances of *Right Node Raising/non-gapping coordination* (Osborne 2006). Therefore, I will show that the relevant examples are not instances of gapping, presupposing that the three properties in (28) are constitutive of gapping.

(28) Constitutive properties of gapping

a. Gapping only functions forward, i. e. the antecedent appears in the initial conjunct and the elided material is located in the subsequent conjunct. Other variants of structure sharing may also allow the shared content to appear after the non-initial conjunct. (Maling 1972, Osborne 2006: 321)

b. In gapping construction, the shared material must be contained inside the coordinated structure, i. e. the initial conjunct according to (28a). In other variants of structure sharing, the shared material may appear outside of the coordinated structure (Osborne 2006: 321).

c. In gapping constructions, the phonological identity of the shared material is lenient. Agreement mismatches are tolerated. In other variants of structure sharing, the requirement on phonological identity is strict (Osborne 2006: 321).

English allows gapping sentences as in (29a). Eliding only the finite auxiliary and retaining the lexical verb, as in (29b), is significantly degraded, although to varying degrees. Clearly impossible, however, is a structure corresponding to the German clause in (25a), here repeated as (30), with only the finite auxiliary present in the initial conjunct and the lexical verb only present in the final conjunct, as in (29c). The gapping of *scrub* in the first conjunct violates the restriction on forward sharing, which is formulated in (28a).

(29) a. [Tom will scrub the sink] and [Bill ~~will scrub~~ the tub].

b. ?/* [Tom will scrub the sink] and [Bill ~~will~~ scrub the tub].

c. * [Tom will ~~scrub~~ the sink] and [Bill ~~will~~ scrub the tub].

(Osborne 2006: 325)

(30) [Der Professor hat einen Studenten ~~zu dem Vernetzungstreffen geschickt~~] und [der
the professor has a student to the network meeting sent and the
Lehrer ~~hat~~ einen Schüler zu dem Vernetzungstreffen geschickt].
teacher has a pupil to the network meeting sent

Second, if the German sentences in (25) would be instances of gapping, they would also violate the requirement that shared material must be inside the coordinated structure, see (28b). In the analysis above, however, both the right-peripheral non-finite verb and the reconstructed finite verb, are outside of the coordinated structure, as illustrated in (27).

Third, in gapping structures, the elided material must be phonologically identical, see (28c). This is best demonstrated by agreement incompatibilities of the finite verb with subjects in two conjuncts. If the subjects of the two conjuncts match in their agreement features the auxiliary is preferably elided in the second conjunct, as indicated in (31). If the subjects do not agree in their respective features, structure sharing is degraded, as in (32).

(31) a. What is [he saying] and [she doing]?
b. (?) What [is he saying] and [is she doing]?
(see Osborne 2006: 321)

(32) a. ?? What is [he saying] and [you doing]?
b. What [is he saying] and [are you doing]?
(Osborne 2006: 321)

In classical gapping structures the phonological identity is known to be relaxed, as shown in (33) for English and in (34) for German.

(33) [I *am doing* the windows] and [you the tables]
a. [I *am doing* the windows] and [you (*are doing*) the tables]
b. [I *am doing* the windows] and [you (**am doing*) the tables]
(see Osborne 2006: 321)

(34) … dass [ich meinen Vater besucht habe] und [du deine Mutter].
that I my father visited have and you your mother
'… that I visited my father and you your mother.'
a. … dass [ich meinen Vater besucht habe] und [du deine Mutter (besucht
that I my father visited have.1SG and you your mother visited
hast)].
have.2SG
b. … dass [ich meinen Vater besucht habe] und [du deine Mutter (besucht
that I my father visited have.1SG and you your mother visited
*habe)].
have.1SG

Note the contrast with the non-gapping coordination in (35a). The verb cluster on the right is shared by both conjuncts and must therefore agree with both subjects, which is impossible in (35a) but necessary in (35b).

(35) a. … dass [ich meinen Vater] und [du deine Mutter] besucht *habe/ *hast.
that I my father and you your mother visited have.1SG have.2SG

b. … dass [das Mädchen ihren Vater] und [der Junge seine Mutter] besucht hat.
that the girl her father and the boy his mother visited has.3SG
'that the girl visited her father and the boy visited his mother.'

Now, I apply this diagnostic to the examples in (25), repeated here as (36). If one of the subjects is altered to obtain a mismatch with the finite verb, the judgments significantly degrade, as shown in (37). The observation that the phonological identity of the shared element is required provides further evidence in favor of a Right Node Raising analysis and against a gapping analysis.

(36) a. [Der Professor |hat| einen Studenten] und [der Lehrer einen Schüler] zu dem
the professor has a student and the teacher a pupil to the
Vernetzungstreffen geschickt.
networking meeting sent
'The professor sent a student and the teacher sent a pupil to the network meeting.'

b. [Der Professor |hat| einen Studenten zu der Konferenz] und [der Lehrer einen
the professor has a student to the conference and the teacher a
Schüler zu dem Vernetzungstreffen] geschickt.
pupil to the network meeting sent
'The professor sent a student to the conference and the teacher sent a pupil to the network meeting.'

c. [Die Nachbarin |hat| ihrem Sohn eine Sonnenbrille] und [Herr Müller seiner
the neighbor has her son a sunglasses and Mr. Müller his
Tochter eine Gitarre] geschenkt.
daughter a guitar donated
'The neighbor has donated her son sunglasses and Mr. Müller donated his daughter a guitar.'

(37) a. * [Der Professor |hat| einen Studenten] und [wir einen Schüler] zu dem
the professor has.3SG a student and we a pupil to the
Vernetzungstreffen geschickt.
networking meeting sent

b. * [Die Professoren |haben| einen Studenten zu der Konferenz] und [der Lehrer
the professors have.3PL a student to the conference and the teacher
einen Schüler zu dem Vernetzungstreffen] geschickt.
a pupil to the network meeting sent

c. * [Ihr |habt| eurem Sohn eine Sonnenbrille] und [ich meiner Tochter eine
you have.2PL your son a sunglasses and I my daughter a
Gitarre] geschenkt.
guitar donated

In German, two strings that each include a finite verb can be coordinated, too, as shown in (38). Along the lines of the V2-Reconstruction Hypothesis, I predict that the analysis of the

coordination in (38) involves two full clauses. In both clauses, the finite verb is reconstructed. In the first conjunct, the locative phrase and the participle are elided rather than shared, as illustrated in (39).

(38) a. [Der Professor hat einen Studenten] und [der Lehrer hat einen Schüler] zu dem
the professor has a student and the teacher has a pupil to the
Vernetzungstreffen geschickt.
networking meeting sent
'The professor sent a student and the teacher sent a pupil to the network meeting.'

b. [Der Professor hat einen Studenten] und [wir haben einen Schüler] zu dem
the professor has.3SG a student and we have.1PL a pupil to the
Vernetzungstreffen geschickt.
networking meeting sent
'The professor sent a student and we sent a pupil to the network meeting.'

(39) [Der Professor hat$_1$ einen Studenten ~~zu dem Vernetzungstreffen geschickt hat$_1$~~] und
the professor has a student to the networking meeting sent has and
[der Lehrer hat$_2$ einen Schüler zu dem Vernetzungstreffen geschickt ~~hat$_2$~~].
the teacher has a pupil to the networking meeting sent has
'The professor sent a student and the teacher sent a pupil to the network meeting.'

The paradigm in (40) provides further evidence that the predictions of the V2-Reconstruction Hypothesis are borne out and that the analysis in (39) is adequate. The Right Node Raising sentence in (40a) relates the external shared material with the conjuncts. Hence, a collective reference to the direct object of the two conjuncts by a plural pronoun is preferred. In the coordination of the two full clauses in (40b) however, each clause only allows a singular pronoun reference. Hence, the collective reading is unavailable.

(40) a. [Der Lehrer |hat| den jüngeren Bruder] und [die Trainerin den älteren Bruder] zu
the teacher has the younger brother and the coach the older brother to
?seinen/ deren Eltern begleitet.
his their parents accompanied
'The teacher accompanied the younger brother and the coach accompanied the older bother to their parents.'

b. [Der Lehrer hat den jüngeren Bruder] und [die Trainerin hat den älteren Bruder
the teacher has the younger brother and the coach has the older brother
zu seinen/ *deren Eltern begleitet].
to his their parents accompanied
'The teacher accompanied the younger brother and the coach accompanied the older bother to their parents.'

Finally, I note that I judge sentences as in (38) to be clearly dispreferred in comparison to alternatives that involve *canonical* gapping, as in (41).

(41) a. [Der Professor hat einen Studenten] zu dem Vernetzungstreffen geschickt und
the professor has a student to the networking meeting sent and
[der Lehrer einen Schüler].
the teacher a pupil
'The professor sent a student to the network meeting and the teacher a pupil.'

b. [Der Professor hat einen Studenten] zu dem Vernetzungstreffen geschickt
the professor has.3SG a student to the networking meeting sent
und [wir einen Schüler].
and we a pupil
'The professor sent a student to the network meeting and we a pupil.'

The obligatory reconstruction of the finite verb has further consequences. German V2-clauses that contain only one verbal element, i. e. the finite verb, are ambiguous between gapping and non-gapping coordinations, as in (42).

(42) Josef schließt seine Tür und seine Schublade.
'Josef closes his door and his drawer.'

a. Gapping
[Josef schließt seine Tür ~~schließt~~] und [~~Josef~~ seine Schublade ~~schließt~~].
Josef closes his door and his drawer

b. Non-gapping
Josef schließt [seine Tür] und [seine Schublade] ~~schließt~~.
Josef closes his door and his drawer

The base position of the verb can be identified unambiguously by augmenting the verb with a particle. In the non-gapping coordination, the shared material outside of the coordination is identical for both conjuncts. Therefore the coordinated material must fulfill the same function, e. g. being subject or object. In gapping structures on the other hand, restrictions on the elided material are much less restrictive. In (43), the verbal particle may appear in the either one of the potential base positions of the particle verbs, parallel to (42). If the overt element of the second conjunct is simply a potential alternative for the subject of the first conjunct, as in (44), only the gapping analysis is licit. Hence the verbal particle that marks the base position of the finite verb, is only valid in the first conjunct.

(43) Josef schließt seine Tür ⟨ab⟩ und seine Schublade auch ⟨ab⟩.
'Josef locks his door and also his drawer.'

a. Gapping
[Josef schließt seine Tür ab~~schließt~~] und [~~Josef~~ seine Schublade auch ~~abschließt~~].
Josef closes his door from and his drawer too

b. Non-gapping
Josef schließt [seine Tür] und [seine Schublade auch] ab~~schließt~~.
Josef closes his door and his drawer too from

(44) Josef schließt seine Tür ⟨ab⟩ und seine Kollegin auch ⟨*ab⟩.
'Josef locks his door and his colleague too.'

a. Gapping
[Josef schließt seine Tür ab~~schließt~~] und [seine Kollegin ~~ihre Tür~~ auch ~~abschließt~~].
Josef closes his door from and his colleague too

b. Non-gapping
*Josef schließt [seine Tür] und [seine Kollegin auch] ab~~schließt~~.
Josef closes his door and his colleague too from

The rhetorical figure *zeugma* employs similar ellipses which combine verbs with arguments of different types, whereby the lexical meaning of the verb changes.[10] It seems, however, that these lexical differences do not differentiate between gapping and non-gapping structures. Although Right Node Raising (non-gapping) requires phonological identity, it does not seem to require lexical identity, as illustrated by the examples in (45)–(47). Even though the judgments are subtle, I consider the gapping cases (b-examples) harder to understand than the non-gapping cases.

(45) a. Non-gapping (Right Node Raising)
Ich fror vor mich hin, denn nicht nur [meine Mutter], sondern auch [der
I froze before REFL along since not only my mother but also the
Ofen] war ausgegangen.
stove was went out
'I was freezing because not only my mother went out but also the stove extinguished.' (Heinz Erhardt, *Wieso ich Dichter wurde*, http://www.heinz-erhardt.de/html/dichtkunst.html)

b. Gapping
Ich fror vor mich hin, denn nicht nur [meine Mutter war ausgegangen],
I froze before REFL along since not only my mother was went out
sondern auch [der Ofen ~~war ausgegangen~~].
but also the stove

(46) a. Non-gapping (Right Node Raising)
Unverzüglich werde ich [mich bei der Prüfungskommission] und [die Blätter mit
immediately will I REFL at the examination board and the sheets with
einem Ziegelstein] beschweren.
a brick complain/weight
'Immediately I will complain at the examination board and weight the sheets with a brick.'

b. Gapping
Unverzüglich [werde ich mich bei der Prüfungskommission beschweren] und
immediately will I REFL at the examination board complain/weight and
[~~werde ich~~ die Blätter mit einem Ziegelstein ~~beschweren~~].
the sheets with a brick

[10] Many thanks to Laura Dörre for bringing this to my attention.

(47) a. Non-gapping (Right Node Raising)
Maria hat [zuerst mit ihrem Mann] und [dann tief und fest] geschlafen.
Maria has first with her husband and then deep and firm slept
'Maria first had sex with her husband and then was sound asleep.'

b. Gapping
[Maria hat zuerst mit ihrem Mann geschlafen] und [dann ~~hat Maria~~ tief und
Maria has first with her husband slept and then deep and
fest ~~geschlafen~~].
firm

To summarize, the discussion of coordinated structures has revealed that German V2-clauses show significant structural differences in comparison to English clauses. In particular, I have argued that the finite verb in V2-position does not take part in temporary constituents. This, in turn, disfavors an analysis of cascading structure buildup and favors the insertion strategy as the preferred analysis of parsing of V2-structures.

7.2.2 The preverbal area: Licensing direction and core interpretation domain

Following Haider (2012), I assume that languages with head-initial VPs (VSO and SVO languages) have anterograde[11] licensing heads. As a consequence, head-initial VPs show two main properties: *compactness* and *strict serialization* (Haider 2010: 10–14). Compactness means that no element may intervene between the verbal head and its object, as in (48a), or between two objects, as in (48b). Strict serialization is the absence of scrambling, as shown in (48c). The corresponding German examples in (49) illustrate that the head-final V-domain in German differs with respect to both of these properties.

(48) English
a. We will [prepare (*carefully) this dish].
b. You have [told (*humorously) your students (*humorously) personal stories].
c. * You have [told personal stories$_1$ your students t_1].

(49) German
a. Wir werden (sorgfältig) dieses Gericht (sorgfältig) zubereiten.
we will carefully this dish carefully prepare
b. Du hast (humorvoll) deinen Studenten (humorvoll) persönliche Geschichten
you have humorously your students humorously personal stories
(humorvoll) erzählt.
humorously told
c. Du hast persönliche Geschichten$_1$ deinen Studenten t_1 erzählt.
you have personal stories your students told

[11] *Anterograde* means progressing in the forward direction, locally and temporally.

Haider (2012) demonstrates that the properties compactness and strict-serialization are consequences of head-initial and head-final phrases across domains, i. e. these regularities are not restricted to verbal projections but hold also for NPs, APs etc. I assume that processing mechanisms differ as a function of the headedness of a phrase. Parsing of head-initial phrases is *predictive* with respect to the thematic structure, whereas parsing of head-final phrases is *integrative*. Thus, the processor employs the cascading strategy for head-initial phrases, a simple right-branching extension for head-final phrases, and the insertion strategy for head-final V2-structures.

In V2-clauses, the insertion strategy requires some kind of decision mechanism whether to insert incoming phrases preverbally or postverbally, i. e. higher than the verbal head of the clause or lower. Superficial cues for the clause-final position are, for example, provided by the non-finite parts of the verb cluster, complementizers of subordinate clauses and intonation. A similar decision mechanism must also be assumed for the cascade strategy, namely a decision whether the verb has to be lowered or not. This could be triggered by the valency of the verb.

Phrase structures built by both strategies, insertion and cascading, seem to have a *core interpretation domain*. In the cascading structure this domain consists of the postverbal area, i. e. the adjacent arguments. Since the verb precedes its arguments, the representation that results from the identification of a verb is likely to be incomplete in the sense of (20) in Section 4.1.4, i. e. its particular interpretation depends on the arguments and hence may be revised. The two properties of head-initial phrases *compactness* and *strict serialization* enforce that the verb meaning will be completed as early as possible.

Carlson & Tanenhaus (1988) report an informal experiment that investigates the processing difficulty of thematic and lexical ambiguity in English. In (50) the string *Bill set the alarm clock* is ambiguous with respect to the lexical meaning of *set*. The sentences are disambiguated by the final phrase in (50a) and (50c). Sentences (50b) and (50d) form unambiguous control conditions. Similarly, the clauses in (51) contain a thematic ambiguity. The initial string *Bill loaded the truck* is ambiguous with respect to the thematic role of the NP *the truck* which can either be goal as in (51a) or a theme as in (51c). Again the clauses in (51b) and (51d) represent unambiguous control sentences.

(50) Lexical ambiguity[12]

a. Bill set the alarm clock for six in the morning.

b. Bill reset the alarm clock for six in the morning.

c. Bill set the alarm clock onto the shelf.

d. Bill put the alarm clock onto the shelf.

(Carlson & Tanenhaus 1988: 274)

[12] Joseph Bayer pointed out that the two meanings of *set* must ultimately receive different analyses. In ditransitive structures, the verb has to be lowered in order to license the indirect argument *onto the shelf*, as in (i.a), whereas the adjunct *for six in the morning* in (i.b) can be adjoined to the VP without lowering of the verb. This resembles the mirror image of the VP shell analysis of Larson (1988).

(i) a. *Bill [~~set~~ [the alarm clock] [set [onto the shelf]]].*

b. *Bill [[set the alarm clock] [for six in the morning]].*

(51) Thematic ambiguity
   a. Bill loaded the truck with bricks.
   b. Bill filled the truck with bricks.
   c. Bill loaded the truck onto the ship.
   d. Bill drove the truck onto the ship.
   (Carlson & Tanenhaus 1988: 274)

Carlson & Tanenhaus (1988) conducted a decision task experiment in which the participants had to decide whether the sentence *makes sense* as quickly as possible. Lexical ambiguity evokes longer reaction times and a lower percentage of positive answers (*makes sense*) than thematic ambiguities and unambiguous control conditions. A post hoc analysis revealed that the reaction time difference is due to cases of lexical ambiguity which are disambiguated towards the less-preferred sense. They report a similar but weaker effect for disambiguation towards the less-preferred thematic structure. Carlson & Tanenhaus (1988) assume that only one of several possible meanings of an ambiguous verb, namely the contextually most appropriate, will remain active during on-line processing. Later reaccess of an alternative meaning is comparably costly, whereas readjustment of thematic roles is comparably easy.

Assuming that the processing mechanism of German resembles the English procedure, we expect that German shows severe problems with resolving lexical ambiguities, caused by homonymous predicates, polysemous predicates, or incomplete particle verbs (see Section 4.3.4). However, those potential garden-path sentences are typicality unproblematic, which indicates that the semantic interpretation of these predicates is delayed. I suggest that the core interpretation domain of head-final insertion structures consists of the preverbal area. Upon reaching the verb, the VP's content will be chunked and sent to interpretation. This chunk has to be interpretational complete, as was defined in (20) of Section 4.1.4, i. e. the meaning of the predicate must not change after this point. Therefore, all parts that are required for the identification of the interpretational properties of the predicate must be available at this point. The intuition behind this assumption is the following: Imagine an incomplete structure is sent to interpretation prematurely. First, the processor activates a particular verb meaning. Subsequently, an incompatible element is encountered and the structure has to be reanalyzed. Reanalysis of meaning involves the reaccess of lower level elements (phonetic or morphology), which is costly because the activation level of the lower level representation have faded and must be reactivated. Depending on the distance and thereby the temporal decay, the processor may not be able to reactivate the lower level representations at all and may be only able to reconstruct the content partially. Depending on the headedness of the VP, we observe one of the two instances for processing incomplete structures: Head-initial phrases employ the anticipation strategy and activate the contextually most appropriate meaning as soon as the verb is encountered. This decision may have to be revised. Head-final phrases also initiate the interpretation process at the verb. At this point, however, the arguments are already accessible and the mapping is complete. In V2-clauses of verb-final languages, such as German, the processor adheres to the integrative licensing of VP-internal material to the left of the verb. This results in delayed interpretation of the finite verb at the clause-final position.

7.2.3 The postverbal area: Extraposition and its restrictions

Extraposition seems to be an exception to the requirement that the core interpretation domain must be complete. Closer inspection of the restrictions on extraposition, however, will reveal that extraposition is only apparently an exception. The discussion will lead to a more precise understanding of the core interpretation domain. I will first discuss the difference between extraposition of nominal and clausal complements before I take a closer look at the extraposition of PPs.

Extraposition is another instance of non-linear parsing. We might describe extraposition as delayed pronunciation of a certain constituent. Verb-final languages exhibit complex center embedded patterns, as illustrated in (52a). Especially for selected clauses, as in (52b), and relative clauses, it has been proposed that extraposition is a structural option that facilitates parsing because the dependents (arguments) of the matrix verb *versprochen* 'promised' can be assigned earlier in the extraposed variant (52b), namely after *Lehrerin* 'teacher', in contrast to the in-situ variant in (52a), in which the assignment is delayed until the sentence-final position (Hawkins 2004: 142–146).

(52) a. Gestern hat [der Vater$_i$ der Lehrerin [PRO$_i$ seinen Sohn der Tochter
yesterday has [the father]NOM [the teacher.F].DAT [his son]ACC [the daughter
des Hausmeisters vorzustellen] versprochen].
[of the janitor]GEN]DAT introduce.INF promised
'Yesterday the father promised to the teacher to introduce his son to the daughter of the janitor.'

b. Gestern hat [der Vater$_i$ der Lehrerin t_1 versprochen] [PRO$_i$ seinen
yesterday has [the father]NOM [the teacher.F].DAT promised [his
Sohn der Tochter des Hausmeisters vorzustellen]$_1$.
son]ACC [the daughter [of the janitor]GEN]DAT introduce.INF
'Yesterday the father promised to the teacher to introduce his son to the daughter of the janitor.'

I presume that not all instances of right dislocation have a homogeneous cause. Within the limit of this dissertation, I cannot address the phenomenon of extraposition thoroughly. Instead, I will focus on the restrictions of extraposition. Extraposition in German is severely restricted and only observed for embedded clauses and PPs (Haider 2010: 188–196).[13] Extraposition of clausal complements is always possible and even strongly preferred for finite clauses. Non-clausal complements of the verb must not be extraposed. I assume the cause for the ban on non-clausal arguments is that the meaning of the predicate is specified by its non-clausal arguments. Here is an example: The verbs *versuchen*/*probieren* are polysemous with a base meaning of 'try' as in (53a). With an NP argument, denoting edible things, the verbs have an alternative meaning 'taste', as in (53b).

[13] I will not consider the extraposition of heavy DP arguments as presentend in Haider (2010: 192). They seem to be subject to additional constraints, which cannot be discussed here.

(53) a. Heute hat Julius im Kindergarten [das Eis mit Erdbeergeschmack selbst
Today has Julius in the kindergarten the ice with strawberry flavor self
herzustellen] versucht/probiert.
make tried
'Today in kindergarten Julius tried to make the ice cream with strawberry flavor.'

b. Heute hat Julius im Kindergarten [das Eis mit Erdbeergeschmack]
Today has Julius in the kindergarten the ice with strawberry flavor
versucht/probiert.
tasted
'Today in kindergarten Julius tasted the ice cream with strawberry flavor.'

The DP argument is crucial for the specific verb meaning. Therefore it must be contained in the core interpretation domain. Indeed, extraposition of the non-finite clause in (54a) is fine, whereas extraposition of the DP in (54b) is out.[14]

(54) a. Heute hat Julius im Kindergarten versucht/probiert [das Eis mit
Today has Julius in the kindergarten tried the ice with
Erdbeergeschmack selbst herzustellen].
strawberry flavor self make
'Today in the kindergarten, Julius tried to make the ice cream with strawberry flavor.'

b. *Heute hat Julius im Kindergarten versucht/probiert [das Eis mit
Today has Julius in the kindergarten tasted the ice with
Erdbeergeschmack].
strawberry flavor

A similar contrast can be illustrated with the verb *ärgern*, which is ambiguous between the agentive meaning 'tease' and the experiencer object meaning 'annoy'. The subject in the agentive use in (55a) is expressed by a DP. In the experiencer object use in (55b), on the other hand, the subject is expressed by a clausal complement. The contrast in (56) shows that the DP in (56a) cannot occur postverbally, whereas the clausal subject in (56b) can.

(55) a. [Der Junge aus der Nachbarschaft] hat meinen Bruder geärgert.
the boy from the neighborhood has my brother teased
'The boy from the neighborhood teased my brother.'

[14] A restricted class of cluster verbs in German also allow the so called *third construction*, as in (i), in which the argument (*the ice …*) of the lower verb (*make*) appears before the clustering verb (see Haider 2010: 284–286 and references therein).

(i) *Heute hat Julius im Kindergarten [das Eis mit Erdbeergeschmack] versucht/probiert selbst herzustellen.*
Today has Julius in the kindergarten the ice with strawberry flavor tried self
make
'Today in the kindergarten, Julius tried to make the ice cream with strawberry flavor.'

b. [Dass wir schon nach Hause gehen] hat meinen Bruder geärgert.
that we already at home go has my brother annoyed
'That we already go home annoyed my brother.'

(56) a. Meinen Bruder hat ⟨der Junge aus der Nachbarschaft⟩ geärgert ⟨*der Junge
[my brother]ACC has the boy from the neighborhood teased the boy
aus der Nachbarschaft⟩.
from the neighborhood
'The boy from the neighborhood teased my brother.'

b. Meinen Bruder hat (es) geärgert, [dass wir schon nach Hause gehen].
[my brother]ACC has EXPL annoyed that we already at home go
'That we already go home annoyed my brother.'

The stimulus subject can alternatively be expressed as a DP on the surface. This DP however is a representative for a propositional argument, as in (57). In such uses the DP stands for the event of giving the answer, or the fact that the answer has some specific property, such as *dass die Antwort so grob war* 'that the answer was so rude'.[15]

(57) Die Antwort des Lehrers ärgerte den fleißigen Schüler.
the answer of the teacher annoyed the diligent student
'The answer of the teacher annoyed the diligent student.'

The extraposition data show that the restrictions apply to the syntactic category. The extraposed DP in (58a) is ungrammatical even though it represents a clausal element. Only the spelled out clause can be extraposed, as shown in (58b).

(58) a. * Den fleißigen Schüler hat (es) geärgert die Antwort des Lehrers.
the diligent student has EXPL annoyed the answer of the teacher
'The answer of the teacher annoyed the diligent student.'

b. Den fleißigen Schüler hat (es) geärgert, dass die Antwort des Lehrers so grob
the diligent student has EXPL annoyed that the answer of the teacher so rude
war.
was
'That the answer of the teacher was so rude annoyed the diligent student.'

The restrictions on PPs, on the other hand, are not specified formally but functionally. PPs (and DPs) appear at the right edge only if they are adverbial, as in (59).

(59) a. Ich habe gestern noch im Büro gearbeitet [bis spät in die Nacht].
I have yesterday still in-the office worked till late in the night

b. wenn sie nicht geheiratet hätte [letztes Jahr] /*seinen Nachbarn.
if she not married had last year his neighbour
(Haider 2010: 191–192)

[15] Thanks to Anne Temme for bringing this to my attention.

If the PP functions as a secondary predicate, i. e. if it specifies the meaning of the predicate, as in (60), then the PP has to be contained in the core interpretation domain and must not be extraposed.

(60) a. Resultative predicate
*Er hat es geschnitten [in kleine Stücke].
he has it cut into small pieces
'He cut it into small pieces.'

b. Directional predicate
*Er hat sie gestellt [in eine Ecke].
he has her put into a corner
'He put her into a corner.'

c. Predicative PP
*Es ist gewesen [in einem schlechten Zustand].
it is been in a bad shape
'It has been in a bad shape.'

(Haider 2010: 192)

The generalization that we can draw about extraposition (and its restrictions) is the following: The core interpretation domain must be complete. Information which is necessary for the interpretation of the event must appear preverbally because at the clause-final position, i. e. the base position of the finite verb, the structure is mapped onto the semantic representation. Any postverbal information that alters the meaning of the verb, enforces the processor to reanalyze the VP. Structures that violate this principle are good candidates to be excluded by grammatical conventions because they are highly error prone. This does not exclude that additional information is added later on, but such additions are typically only allowed for adjuncts which do not alter the interpretation of the event.

I will conclude the discussion of extraposition with a remark concerning the violation of restrictions on extraposition. There are actually grammatical possibilities to add argumental information in the postverbal area. This is shown in (61a), an extension of (59b), and (61b). The examples involve coordinative-restrictive elements such as *oder zumindest* 'or at least' and *und zwar* 'and in fact', that trigger gapping structures that permit extensions of the gapped (duplicated) predicate. The parallel examples in (61c) and (61d) show that such extension are only permissible if the initial string is already acceptable.

(61) a. Wenn sie nicht geheiratet hätte oder zumindest nicht seinen Nachbarn.
if she not married had or at least not his neighbour

b. Sie hat geheiratet und zwar ihren Nachbarn.
she has married and in fact her neighbor

c. * Sie hat angelächelt und zwar ihren Nachbarn.
she has smiled at and in fact her neighbor

d. * Den Schüler hat (es) geärgert und zwar die Antwort des Lehrers.
the student has EXPL annoyed and in fact the answer of the teacher

The processing routine, as it has been sketched above, does not rule out that predicates may be specified postverbally but it predicts that such cases are considerably demanding. Indeed, we find rhetorical figures in which those restrictions on postverbal complementation are intentionally violated. Examples of that sort are the zeugmata in (45)–(47) above or the one in (62), in which the two meanings *ausgehen* 'go out' and *von etwas ausgehen* 'assume something' are contrasted. The argumental PP *davon* 'thereoff' in the second part is extraposed.

(62) Ich gehe aus, Baptist! Vor allem davon, dass Sie mir auf meine Talerchen achten!
I go out Baptist above all thereof that you me for my coins watch
'I go out Baptist. And I assume that you will watch my money.'
(attributed to Dagobert Duck, https://de.wikipedia.org/wiki/Zeugma_(Sprache))

I mentioned above that these constructions appear to be more degraded in the gapping analysis in contrast to the Right Node Raising analysis, in (45)–(47). Within the current perspective, this receives a principled explanation: In the gapping analysis, the first conjunct is complete and sent to interpretation as soon as the finite verb is encountered. During the processing of the second conjunct the content of the first conjunct is copied. Due to the incompatibility of the two argument structures, lower level representations of the copied content (phonological representation, syntactic representation) have to be accessed. In the Right Node Raising analysis, on the other hand, the core interpretation domain remains incomplete until the end of the sentence. At the clause-final position the meanings of the two conjuncts are computed in parallel[16].

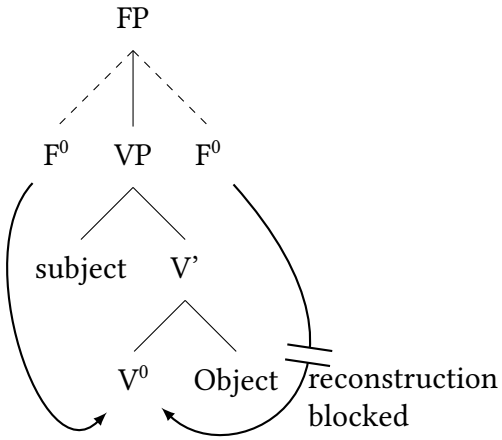
7.2.4 Speculations about crosslinguistic generalizations

I argued above that elements which are displaced into a higher functional projection are reconstructed into their base position for interpretation. This holds for phrasal movement such as *wh*-movement and topicalization, but also for displaced heads, such as the finite verb in V2-clauses. In canonical cases, leftward movement adds a meaning component to the moved item, such as scope to *wh*-elements, or information structural aspects, such as topic and focus. In case of V2-movement, I assumed that the movement is driven by some abstract requirement for finiteness, and the verb is solely pied-piped. But irrespective of the trigger, the dislocated element has to be reconstructed into the base position for proper interpretation. This reconstruction requirement may be the key to understand left-right asymmetries in phrase structure analyses. One prominent observation concerns the asymmetry of movement patterns: Wh-movement, for instance, seems to proceed only to the left (see *Filler First* principle Hawkins 2004: 203–205). The explanation is obvious: Movement to the left, allows on-line interpretation at the gap site, because the gap follows the filler. Movement to the right, however, will either delay the interpretation or even result in a serious misparse that requires reanalysis.

[16] The term *parallel* is not used in a temporal sense here, rather it should mean that the meaning of each conjunct will be computed independent of the meaning of the other.

I will assume that a lexical head can only be interpreted within its functional extension[17], for example, the VP and its extension, the IP. The functional extension specifies properties that situate the event, such as tense. If the lexical verb moves to a higher functional position, it must reconstruct into its base position to be in the c-command domain of, for instance, sentence negation. If the functional extension of the verb is realized without movement, i. e. by an unbound morpheme, it takes the verb in its core interpretation domain. Accepting these assumptions, it becomes clear why one combination of functional extensions of lexical phrases is apparently absent in natural languages: head-initial lexical phrases that are dominated by a head-final functional extension as illustrated in Haider (2012: 67–81), a configuration that has also been discussed under the term *Final-Over-Final Constraint* (FOFC) (Biberauer et al. 2008)[18]. If higher functional categories have to be reconstructed into their lexical base position, these elements must either precede the base position or they must be adjacent, enabling a cluster formation (for peculiarities of head adjacency see Bayer 1999, Bayer et al. 2005, Haider 2010). Thus, patterns with a head-initial phrase dominated by a head-final one are ruled out, as illustrated in (63) vs. (64). Reconstruction cannot apply to the left, because it involves reprocessing the structure from the base position of the VP onward. In a recursive grammar, the object can be of arbitrary length and so would be the distance between the base position of the verb and its dislocated position in the functional extension.

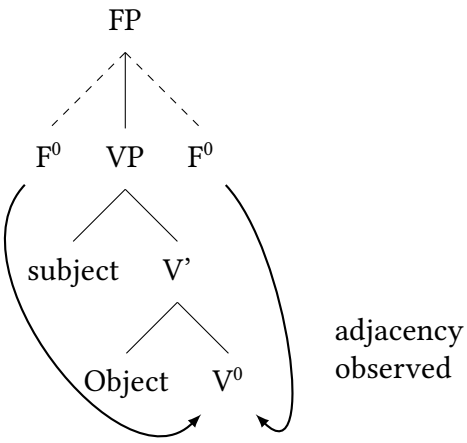
(63)



[17] Functional extensions are functional projections in which lexical content of the head is derived by movement or feature attraction. Lexical complementizers or determiners do not qualify as derived heads (Haider 2012: 71).

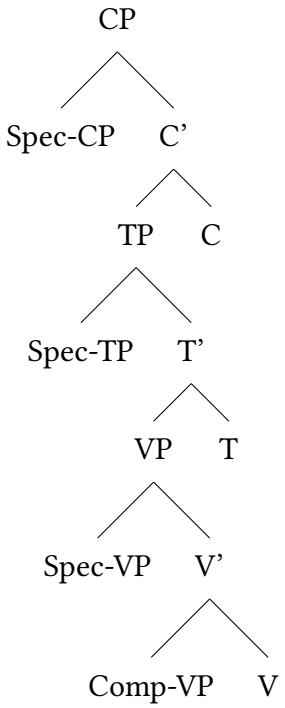
[18] See Haider (2012: 132–135) for a direct comparison of the binary branching conjecture (BBC) and the FOFC.

(64)



In a strictly head-final language, we could also encounter a generalized V-to-C movement. However, this would not result in V2-clauses but in V-final clauses because the movement would be string-vacuous, as can be illustrated in (65). And indeed there exists a discussion about string-vacuous verb movement in head-final languages, such as Japanese and Korean, see Koisumi (2000) and Hatakeyama et al. (2008) for arguments in favor of verb movement, and Kobayashi (2016) for arguments against it. Expectedly, the arguments are based on indirect evidence and are rather complex. Future research will show which position will prevail.

(65)



7.3 Chapter summary

In this chapter, I have provided a detailed description of the mechanics of the V2-Reconstruction Hypothesis. I have argued that V2-parsing does not involve a successive lowering of the verb with multiple instances (copies) of it. In contrast, I have argued that the parser places the finite verb in clause-final position very early and inserts incoming phrases before the verb. I cited experimental results which indicate that the resulting structure will be interpreted as soon as it is potentially complete. Following Phillips (2003), I employed Right Node Raising structures to identify temporary constituents of the German clause during incremental parsing. The results indicated that the finite verb does not take part in temporary constituents, as predicted by the V2-Reconstruction Hypothesis. I have also considered the consequences for the interpretation process of verb-final clauses. The clause-final verb marks the end of the core interpretation domain. This matches with extraction facts that only allow non-argumental constituents and clausal complements to be extraposed. Finally, I have speculated that reconstruction of functional heads might be the cause for the absence of non-adjacent functional heads succeeding their lexical heads.

In sum, I have specified the incremental procedure of V2-parsing in German and identified crucial contrasts to SVO structure building as it has been described for English.

Part III

The role of V2-movement in language acquisition

8 V2 in L1-acquisition

The process of first language (L1) acquisition differs in many respects from the process of learning a second language (L2 acquisition). The main difference is that L1 acquisition is accompanied by learning of basic abilities on all linguistic levels, such as articulation, morphological marking, sentence structures, semantic operations such as negation, and pragmatic reasoning. The L1-acquisition path is also accompanied by general a cognitive and (neuro-)physiological development. This chapter addresses issues of L1-acquisition. Aspects of L2 acquisition and a comparison of both developmental paths will follow in Chapter 9. This chapter begins with a very brief overview of the major developmental stages in L1-acquisition. Section 8.1 provides a summary of observations of the L1-acquisition of German that are relevant to the V2-phenomenon, as well as a comparison to corresponding observations in other V2-languages. In Section 8.2, I will present and compare theoretical accounts that have been proposed to cover L1-acquisition of word order and V2-order in particular.

First language acquisition takes place in successive steps: uttering sounds, combining them to simple and complex syllables, and further increasing these to words and phrases. Generally, the perceptional abilities for coping with a particular level of complexity develops prior to the productional ability, i. e. children may discriminate and understand words before they are able to utter them (Klann-Delius 2016: 36). Since I am interested in the acquisition of verb second order in German, I will focus only on language development at the supramorphemic level. The acquisition of syntax is often divided into stages of utterance length and complexity. I will summarize observation from Mills (1985: 153-158) and Klann-Delius (2016: 39-41). The **one-word stage** ranges from 10–18 month. In this phase, the child produces only one-word utterances and no intonational sequences. Words may belong to different categories such as nouns, verbs, adjectives, adverbials and negation. At this age, children are already able to understand simple sentences, assign syntactic categories on grounds of the syntactic environment and identify discontinuous syntactic elements (Höhle et al. 2006). The **two-word stage** is present approximately at an age between 18–24 months. At this stage, two elements are connected to form meaningful units. Function words, such as articles and prepositions, are still rare during this period, but adjectives and nouns, and nouns and verbs are connected. Combinations with negation and simple questions are also produced. In this phase, children are able to identify subjects and and predicates and use this information to bootstrap the meaning of verbs. The **three and more word stage** ranges from 2;0–4;0 years. At this stage, the regular construction of simple sentences develops followed by the use of embedded sentences, accompanied by the development of inflectional morphology. Function words and more elaborated questions become more frequent. The **complex syntax stage** ranges from 4;0–12;0. Only in this phase, children fully master complex syntactic constructions, such as passive sentences, non-subject relative clauses, and object-before-subject clauses in a way that they are frequently observable in spontaneous speech.

8.1 V2-related observations in L1-acquisition

8.1.1 Data base

The data base for developmental studies about the acquisition of German is still quite restricted (Weissenborn 2002: 82). The CHILDES data base (MacWhinney 2000) host longitudinal corpus data from 7 individuals that cover the whole critical age range from 18 month to 5 years acquiring German as a first language and the data from 30 additional individuals covering a part of that age range.[1] Additional collections of acquisition data include the observations by Stern & Stern (1907), the Mathias corpus (Clahsen 1982), the LEXLERN corpus (Clahsen et al. 1991), the Julia corpus (Tracy 1991), the 5 children corpus used in Fritzenschaft et al. (1990) and Gawlitzek-Maiwald et al. (1992), the 7 children corpus by Rothweiler (1993), and acquisition data of Swiss German that is summarized in Schönenberger (2001). However, developmental phenomena, such as verb placement errors, only appear in a short time window or occur only in a low frequency. Therefore, these phenomena are too scarcely represented in the available data to draw solid conclusions (see Weissenborn 2002).

When available in the quoted sources, I will present information about the children's age following the examples in the usual notation with indication of years and months in parentheses such as (X:yy;mm).[2] The identifier preceding the age, here X, refers to the individuals in the respective corpora, the reader is referred to the original publications.

8.1.2 Verb placement

As Weissenborn (2002: 82) formulates it, children acquiring V2-order in German have to face a two-fold developmental problem: First, the children have to recognize that V-to-C-movement of the finite verb is obligatory in all matrix clauses and second, that in embedded clauses, the verb appears (has to stay) in the clause-final position.

Language acquisition research has identified sequences of developmental steps in the acquisition process. Even though the age in which these changes happen might vary from child to child, the order of the changes remains stable. In the following, I will present an overview of the general observations relevant for the acquisition of word order and verb placement in German. For a rough classification, I will rely on four stages that have be suggested by Clahsen & Muysken (1986). Observations from other researchers will be included along the way. These developmental stages are observed in the age range of 1–4 years.

From the one-word stage onwards children utter verbs. Among those, lexical verbs are produced earlier and modals and auxiliaries are observed somewhat later. These two verb groups differ not only in their chronological occurrence but also in their formal appearance: At the beginning, lexical verbs occur mainly in non-finite forms whereas modal verbs and auxiliaries only appear in finite forms (Weissenborn 2002: 82). Clearly, in one-word utterances, no conclusions about the verb position can be drawn.

[1] Including the data of the children Simone and Kersten (Miller 1979) and the Caroline corpus.

[2] Some corpora such as the Simone corpus (Miller 1979) provide more detailed information with two additional digits indicating days. To keep the notations uniform, I will omit the day-digits.

The **L1-Stage I** begins with the two-word stage (ca. 18 months). From the two-word stage on, the order of the verb and complement, objects or adverbs of copula constructions, is predominantly target-like: finite verbs precede the complement and non-finite verbs follow it, as in (1). While initially, non-finite utterances are predominant, constituting up to 90% of the utterances that contain verbs, the number of finite utterances increases gradually over time (Weissenborn 2002). These two tendencies result in an overall high number of verb-final patterns. From this stage on, verbs may also appear as utterance/sentence-initial constituents if the subject is omitted.

(1) a. ich schaufel haben
I shovel have
'I have a shovel.' (D has the shovel in his hands) (D:02;10) (Clahsen 1982: 64, Clahsen & Muysken 1986: 98)

b. schuh ausziehn
shoe take off
'take of the shoe' (S:01;11) (Weissenborn 2002: 83)

In **L1-Stage II** (ca. 26 months), verbs containing morphological indicators which are typical for non-finite form, such as particles of particle verbs, commonly appear in final position, as in (2). However, utterances that include a subject and a non-finite verb occur in less than 10% of the data, i. e. non-finite utterances are mostly fragments consisting of object/adverbs and verbs, as in (1b). This indicates that the children have already established a dependency between second position and finite verb forms. Weissenborn (2002) also states that verb placement errors show a insightful asymmetry: There are almost no errors in which non-finite verbs are placed in second position but around 10% non-target-like placements of finite verbs in final position, as in (3).

(2) purzel pierkorb rausräum
Purzel paper basket remove
'Puzel removed the paper basket.' (looking at a picture book, M. points to a dog (= Purzel), who has removed the paper basket) (Clahsen & Muysken 1986: 98)

(3) der teddy zu dick ist
the teddybear too thick is
'The teddy bear is too thick.' (J:02;06) (Clahsen 1982: 69, Clahsen & Muysken 1986: 98)

In **L1-stage III** (ca. 30 months), all finite verbs appear in second position and analytic verb forms now appear in discontinuous order with the finite part in second position and the non-finite part in final position, as shown in (4). At this stage, the relation between finiteness and second position develops to a bidirectional condition. This is the point in which verb second order increases from 40 % to 90 % within one month (Clahsen & Muysken 1986: 98-103). The correct order of verb before subjects in interrogatives and structures with preposed arguments are also observable. Verb-initial structures may still occur but they are mostly structures in which the subject or the interrogative pronoun is omitted, as in (5).

(4) ein schiff muss du erst jetzt bauen
a ship must you firstly now build
'Now you must firstly build a ship.' (Clahsen & Muysken 1986: 99)

(5) a. ∅ hab ein Wurst macht
have.1SG a saussage made
'I have made a saussage.' (M:03;01) (Clahsen 1982: 58, Clahsen & Muysken 1986: 99)

b. ∅ is das?
is that
'What is that' (S:02;00) (Weissenborn 2002: 83)

L1-Stage IV (ca. 35 months) differs from the other stages in that it considers word order in embedded clauses. The accuracy of finite verb placement in embedded clauses during the acquisition of German receives varying judgments by different scholars. According to Mills (1985: 164), Clahsen & Muysken (1986: 99–101), and Rothweiler (1993: 42) verb placement errors are practically non-existent, i. e. as soon as children produce embedded clauses, they place finite verbs in clause-final position, as in (6), and do not overgeneralize matrix clause order. In contrast, Gawlitzek-Maiwald et al. (1992: 142-148) argue that at least some learners show regular error patterns, as shown in (7). The authors report that those errors did only occur in utterances of one child whereas they were totally absent in the utterance of the other learners under investigation. Schönenberger (2001: 62–131) even reports that her two learners of Swiss German (Lucern dialect) hardly ever apply the verb-final order in embedded clauses before the age of 05;00 but produce V1 or V2-structures across all types of embedded clauses, as shown in (8). Around the age of 05;00 the V-final order increases rapidly. This contrasts with the longitudinal study of one child acquiring Swiss German (Bern dialect) that consistently uses V-final patterns from the first occurrences of embedded clauses (Penner 1996: 35–78), shown in (9), and produces illicit V2-patterns only in a short period of time (03;01–03;05) and only for a restricted set of clauses types (*wh*-interrogatives and *wo*-relative clauses). Additional evidence for individual-specific variation comes from Müller (1996: 1012–1014). She reports that only one of the three investigated French-German bilingual children shows non-target like V2-order in embedded clauses in stage IV, as in (10), even though it is the dominant word order in embedded clauses until age 04;04. I therefore conclude that non-target like embedded clauses may occur for a limited period. However these error patterns are not part of the general acquisition process but rather one of several strategies in the mastering of word order in complex clauses.

(6) German
ich will mal sehen ob das schwarz ist
I want to see whether this black is
'I want to see whether this is black.' (M:03;06) (Clahsen 1982: 68, Clahsen & Muysken 1986: 99)

(7) German

a. will die meerjungfrau habe dass du has net die meerjungfrau
want the mermaid have that you have not the mermaid
'(I) want to have the mermaid so that you won't get the mermaid.' (Benny:03;00)

b. wenn hab i au mal burtstag habt
when have i too once birthday had
'When I had a birthday, too.' (Benny:03;01)

c. weil hab ich mich auch nassgespritzt
because have I myself too splashed
'Because I splashed myself too.' (Benny:03;01)

d. weißt du wer geht jetzt daraus?
know you who goes now out there
'Do you know who will come out (of this building) now?' (Benny:03;06)

(Gawlitzek-Maiwald et al. 1992: 146–147)

(8) Swiss German (Lucernese)

a. Wenn chunt t'Hex före muesch die grad au bröötle
when comes the which outside must.2sg that one prt also fry
'When the witch appears then you have to fry her too.' (M:03;10)

b. Und de hät de Güggel ghört dass hät's Ameili grad hinderem Huus.
and then has the cock heard that has it ants prt behind the house
'And then the cock heard that there were ants behind the house.' (E:04;11)

c. Jetzt had-i grad glueget öb's hät am Salot Lüüs oder ned.
now have-I just looked whether it has on the salad greenfly of not
'I've just checked whether there are any greenfly on the salad or not.' (M:04;02)

(Schönenberger 2001: 88, 89, 93)

(9) Swiss German (Bernese)

a. wo isch ds chline Outo, wo ds Loch gmacht het?
where is the small car, which the hole made has
'Where is the small car which made the hole?' (J:02;06)

b. gsesch, wi das lüchtet?
see.2sg how it shines
'Do you see how it shines?' (J:02;08)

(Penner 1996: 42)

(10) German (bilingual French-German)

a. erst wenn wir sind fertig mit das
first when we are ready with it
'Not until we have finished it.' (Iv:03;04)

b. guck mal wie des is groß
look once how this is big
'Look how big this is.' (Iv:03;08)
(Müller 1996: 1012)

In sum, verb placement errors in matrix clauses are generally quite limited in L1-acquisition of German. In embedded clauses, there seems to be individual variation whether a child overgenerates V2-movement or not. However, after a certain period the target-like patterns become dominant quite rapidly.

8.1.3 Acquisition of finiteness, tense and agreement

In the previous section, it was observed that children establish a relation between verb movement and finite inflection very early, at **L1-stage II**. Clahsen & Penke (1992) and Clahsen et al. (1996) assume that the acquisition of subject-verb agreement is developmentally connected to the systematic use of V2-patterns. In a detailed analysis of longitudinal data sets[3], they observe that, before inflection is regularly used, there is a two way distinction of verbal elements between finite-verbs marked with *-t* and non-finite verbs marked by *-n*. For bare stems, verbs with ∅-inflection, one cannot distinguish between finite and non-finite use (Clahsen & Penke 1992: 206). The authors argue that only the inflectional affix for the second person singular *-st* is a robust indicator of the acquisition of verbal agreement morphology because it is the only formal unambiguous inflectional person affix in German. The use of the *-st* affix and the regular use of other agreement morphemes starts at approximately 02;04 years.[4] As soon as the inflectional paradigm has been acquired, the V2-placement of finite verbs increase from 43–71% to 93–100% (Clahsen et al. 1996: 144).

Other authors disagree with the claim that the establishment of subject-verb agreement is a necessary prerequisite for systematic V2-movement (Weissenborn 1990), or the claim that finiteness marking and corresponding verb movement appears much earlier (Poeppel & Wexler 1993, Rohrbacher & Vainikka 1994). The incompatibility is, however, mostly restricted to the conclusions that the respective authors draw. The observations are in no opposition, as Poeppel & Wexler (1993: 9) even acknowledge. Their observations are basically identical to the results of Clahsen et al. (1996) except that the learner is three month younger than the youngest child in the other data set. A similar reasoning applies to the data of Rohrbacher & Vainikka (1994)[5] who analyze observations at age 01;05 and age 01;08. Similar to Clahsen & Penke (1992), they found a considerable proportion of null subjects (46%), one of the indications of insufficient development of subject-verb agreement. Additionally, approximately one third of the utterances are not classifiable as either V2 or V-final because the

[3] Clahsen & Penke (1992) analyze the data of the child Simone of the Miller corpus (Miller 1979). Clahsen et al. (1996) add one child from (Clahsen 1982) and three children from the LEXLERN corpus (Clahsen et al. 1991).
[4] Before that time, already other verbal elements may end in *-st* but these are irregular forms of auxiliaries and modals which Clahsen & Penke (1992: 193) assume are formulaic expressions, i. e. holistic lexical entries, and not compositional word form based on morphological rules.
[5] Two children, Katrin and Nicole, from the Wagner corpus (Wagner 1985).

utterances only consist of two elements. As noted above, such a rate of two-word utterances is not exceptional at such ages.

In sum, German children produce stable V2-patterns at the same time as they show consistent subject-verb agreement marking. This development is accompanied by consistent overt realization of subjects.

8.1.4 Verb doubling

In this section, I will present an observation, which concerns the double pronunciation of the finite verb, that I will call *verb doubling*[6]. Verb doubling is, although very rare, first attested in matrix clauses at early stages (L1 stage I) at which children are still developing matrix clause order (Hohenberger 2002: 176–178). Characteristic examples are given in (11). Note that almost all cases exhibit non-subject-initial interrogative clauses.

(11) a. is papadeien is?
is parrot is
'Is this a parrot?' (T:02;00) (Hohenberger 2002: 176)

b. is räten papadeien is?
is red parrot is
'Is this a red parrot?' (T:02;00) (Hohenberger 2002: 176)

c. es hüna papadeien is?
is green parrot is
'Is this a green parrot?' (T:02;00) (Hohenberger 2002: 176)

d. wo ist Mutter ist?
where is mother is
'Where is mother?' (about 02;00) (Penner 1994)

e. wo is das junge is
where is the boy is
'Where is the boy?' (J:02;03) (Tracy 1991: 240)

f. wo-s die laterne tracys laterne is
where-is the hand lantern tracy's hand lantern is
'Where is Tracy's hand lantern?' (J:02;03) (Tracy 1991: 240)

g. mach ein großen Pilz gemach
make a big mushroom made
'(I) have made a big mushroom' (J:02;04) (Tracy 1991: 240)

h. wo-s der andere is
where-is the other is
'Where is the other?' (J:02;05) (Tracy 1991: 267)

[6] Penner (1996) and subsequently Schönenberger (2001) use the term *verb copying*. In my opinion, this terminology already includes a syntactic analysis, which may or may not turn out to be adequate. I will therefore use the more descriptive label *verb doubling* that only indicates that a verbal element that is pronounced once in the target language, is pronounced twice by the learner.

i. wo-s meine Mülltonne is
where-is my trash can is
'Where is my trash can?' (J:02;05) (Tracy 1991: 267)

A second phase of verb doubling seems to be present during the development of embedded clauses. This development can be divided into the following steps: First, a *preconjunctional stage*. The subordinate clauses are finite and show typically a V-final order, but lack a subordinating element altogether or exhibit only an indifferent sound. Nevertheless, they are clearly identifiable as embedded clauses (Stern & Stern 1907: 190–193, Rothweiler 1993: 42–52, Penner 1996: 35–38, Penke 2001: 354–356). Examples are given in (12).

(12) a. mau luege chaut isch
let's look cold is
'Let's look whether it is cold.' (J:02;01) (Penner 1996: 35)

b. papa sieh mal – Hilde macht hat
father look once Hilde made has
'Father look what Hilde has made.' (Hilde Stern:02;06) (Stern & Stern 1907: 192)

After the acquisition of complementizers, Penner (1996: 46–62) reports verb doubling patterns in embedded clauses for a short period of time (03;04–03;11), as in (13).

(13) a. wo si de die Teile, wo wei mir ga liime wei?
where are PRT those parts REL want.1PL we go glue want.1PL
'Where are those parts which we want to glue?' (J:03;04) (Penner 1996: 47)

b. lue was ha-n-i gmacht ha
look what have I done have
'Look what I have done.' (J:03;07) (Penner 1996: 52)

Schönenberger (2001: 137-140) reports that verb doubling in the embedded clauses appear significantly later for the two children in her corpus, around age 05;00, as in (14).

(14) Swiss German

a. det wo simmər echt scho zweimol gsi sind
there where are-we PRT already twice been are
'at the place where we were twice' (M:04;10)

b. wil si hät ebe de Fuess proche hät
because she has PRT the foot broken has
'because she broke her ankle' (M:05;00)

c. wil er hät chalt hät
because he has cold has
'because he has cold' (E:05;01)

(Schönenberger 2001: 138)

Schönenberger (2001) also reports cases with two non-identical verbal elements that appear in the respective positions. This is illustrated by the combination of the auxiliaries *sein* "be" and *haben* "have" in (15). These non-identical doubling examples, together with the cliticization case in (14a), indicate that verb doubling cannot be taken as pure copying of phonological material.

(15) Swiss German

a. wenn's isch ebe fescht gregnet hät …
if-it is PRT heavily rained has
'When it rained heavily …' (M:04;08)

b. end etz hetsch mi gseh [wie-n-ich heeti do here ghocket wär]
and now had.2SG me seen how-I had then here sit were
'and you would have seen how I would have sat there'(M:05;04)

(Schönenberger 2001: 139)

As (Schönenberger 2001: 139) notes, verb doubling generally occurs with non-thematic verbs, such as auxiliaries, modal verbs, copula verbs, and in possessive structures. The only exception in her corpus, involving a particle verb, is given in (16). Another example is the matrix clause doubling in (11g), above.

(16) Swiss German
Weiss si dass du häsch grüeni Finke aahäsch?
knows she that you have green slippers on-have
'Does she know that you're wearing green slippers?' (M:05;00)
(Schönenberger 2001: 139)

The two cases of verb doubling in embedded clauses receive different explanations. Penner (1996) interprets the doubling cases as an interim structure, from general verb-final embedded clauses to restricted cases of non-root V2-clauses. The later occurrences in Schönenberger (2001) appear at the transition from non-target-like V2 embedded clauses to the application of strict verb-final order.

Verb doubling is, very rarely, also observable in spontaneous utterances of healthy adult native speaker, as shown by the comment of a TV reporter in (17). Such cases are most likely considered to be *performance errors*, the underlying reason, a movement dependency with multiple spell-out, however, holds nevertheless.

(17) Warum dieses Unglück heute hier in Genua passiert ist, das **werden** aber noch
why this accident today here in Genoa happened is that will however still
genauere Recherchen und Ermittlungen feststellen **werden** müssen.
more precice research and investigations determine will must
'Why this accident happend here today in Genoa must be determined by more thorough, future analyses and investigations.' (Comment by the Austrian TV reporter Katharina Wagner, in the newscast *Tagesthemen* of the public German broadcasting station *ARD*, 14.08.2018)

In sum, verb doubling appears in matrix clauses only at an early stage around age 02;02–02;05. Almost all examples involve matrix clause questions. In embedded clauses, verb doubling appears at a later stage, at which finite embedded clauses with lexical complementizers are already fully developed. Generally, verb doubling only appears directly preceding the emergence of a new verb placement pattern, indicating an uncertainty of the exact verb placement. The restriction to functional verbs and observation that the two verbal elements don't have to be identical indicate that verb doubling is the realization of a more abstract grammatical dependency between the two realization sites.

8.1.5 Verb placement in the L1-acquisition of other V2-languages

This section presents a very brief summary of observations concerning verb placement in other V2 a languages. These observations fall into two groups, the acquisition of Dutch and the acquisition of Mainland Scandianavian languages Swedish, Norwegian and Danish.

The realization of the basic word order differs in the acquisition paths of these groups from the two-word phase on, in which non-finite verb-complement structures are uttered: Dutch children thereby produce OV structures (Wijnen & Verrips 1998: 229) like the German children, whereas Scandinavian children produce VO structures (Plunkett & Strömqvist 1992: 480–481, Platzack 1996: 376–377). A consistent use of V2 matrix clauses can be located at age 02;10, comparable to German.

Embedded clauses in Dutch appear between age 03;00–03;06. Similarly, they initially lack complementizers. The word order is thereby consistently V-final (Wijnen & Verrips 1998: 246, Schönenberger 2001: 51, fn. 3). The identification of (correct) word order in embedded clauses in Scandinavian is not straigthforward, because V2 and SVO are identical in many cases. The relative position of the finite verb and negation may give an approximation: Plunkett & Strömqvist (1992: 496) cite a study of Swedish children (age 02;00–03;06) in which target-like placement of negation before the finite verb in embedded clauses varies from 100% in conditional clauses to 58% in relative clauses with an exceptional value of 9% for causal clauses. Similarly, Westergaard (2009: 183–197) notes that in her corpus of Norwegian only very few cases of overgenerated V2-order in embedded clauses can be identified. Interestingly, (Westergaard 2009) also reports cases of verb doubling in matrix clauses, given in (18) and (19) which, like the German examples in (11) above, appear in interrogative sentences between age 02;00–03;00. Note that, in contrast to the German examples, the doubling does not involve the clause-final position, but the position following the subject, i. e. the lower verb position in Norwegian, as unambiguously illustrated in (19).[7]

(18) Norwegian

a. ka hete han hete?
what is-called.prs he is-called.prs
'What is he called?' (Ina.16:02;07)

[7] Westergaard (2009) also reports declarative structures consisting of utterances with several attempts in which the children start out producing a target consistent word order but placing the finite verb in the lower position in a later attempt.

b. ka hete de der hete?
what is-called.PRS they there is-called.PRS
'What are they called?' (Ina.17:02;07)

c. kem er ho er?
who be.PRS she be.PRS
'Who is she?' (Ina.13:02;05)

(Westergaard 2009: 158)

(19) NORWEGIAN
mamma skal vi skal spise pizza?
mommie shall we shall eat pizza
'Mom, are we going to eat pizza?' (Ann.16:02;07) (Westergaard 2009: 176)

In sum, the acquisition of V2-order seems to elapse in comparable sequences for different V2-languages. The most remarkable difference is certainly the different base word order of VO and OV languages, which is reflected already in early two-word utterances. Verb doubling seems to be a consistent strategy in response to an uncertainty of verb placement. Non-target consistent verb placement also seems to occur with very low frequencies overall.

8.2 Theoretical accounts of the L1-acquisition of V2

The theoretical accounts that are presented in the following are all based on a generative framework, mostly in the fashion of the Principles and Parameters theory (Chomsky & Lasnik 1993). Theoretical approaches to language acquisition investigate two central questions (Weissenborn 2002: 84-86): The first is how the linguistic representation, the child's grammar, changes from the initial state to the final stage, i. e. the adult grammar. This is achieved by specifying the developmental steps that the child passes through in the acquisition process. The second issue is how the changes can be explained, which ask for trigger mechanisms that induce the changes of grammatical representation.

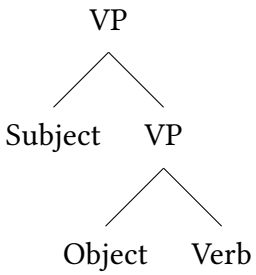
Addressing the first question concerning the initial and early stages of the child's grammar, two extreme positions can be distinguished. On the one hand, Poeppel & Wexler (1993) assume that a fully fledged target-like grammar with all functional projections is available to the child, the *full competence hypothesis*. The contrasting position assumes that the child starts out with a rudimentary phrase structure representation (e. g. lexical projections only) and expand these representations with functional projections during the acquisition process, the *structure building hypothesis* (e. g. Clahsen et al. 1996). Over the years, the structure building hypothesis has prevailed, maybe also because it is more compatible with the guiding principle of economy that became a central issue with the advent of the minimalist program (Chomsky 1995).

Concerning the second question, namely what the trigger for the structure building is, three approaches can be differentiated: The first is the *Maturation Approach*, which states that certain linguistic developments are subject to maturation and evolve spontaneously (Borer & Wexler 1987). Recent neurolinguistics research provides evidence that (morpho)syntactic

processing is detectable in early language development (30 months) (Friederici 2005). Furthermore, Friederici (2012) suggests that the mastering of complex syntactic patterns may be dependent on the develpoment of the dorsal pathway that connects the temporal cortex to the Broca's area. This connection is assumed to play an important role in complex multi-level syntactical structures. Thus, maturation is certainly an aspect that provides insights with respect to the upper boundary of the linguistic abilities at a time but is certainly not satisfactory in explaining the more fine grained developmental changes of language acquisition in general and language specific paths in particular. The second approach is the *Lexical Learning Approach*. It assumes that grammatical concepts such as functional categories are available to the child after learning a morphosyntactic reflex of it, such as regular inflectional paradigms (e. g. Clahsen et al. 1996). The third approach assumes that linguistic parameter are set through unambiguous trigger information, which can be seen as generalized structures (e. g. Weissenborn 1990, Westergaard 2009).

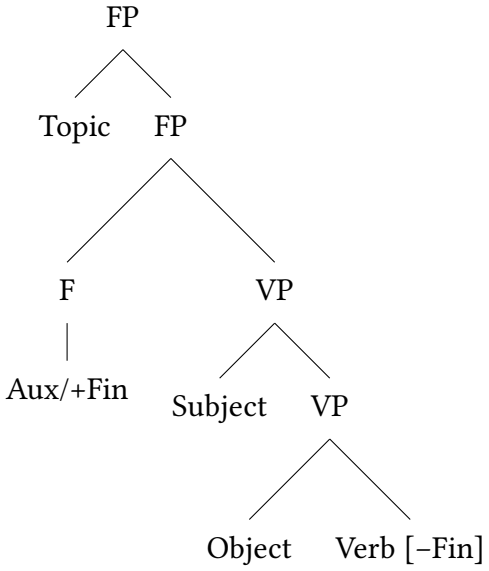
A converging summary may identify three distinct stages of phrase structure grammar to cover the acquisition of basic word order in German (e. g. Clahsen & Penke 1992, Clahsen et al. 1996, Ferret & Perdue 2009, Jordens 2012):[8] In the first stage, *the lexical stage*, the child produces verb-final VP structures, using only lexical projections, see (20a). The first functional extension of the VP, *the functional stage*, consists of an underspecified functional projection that is usually labeled FP, as in (20b). The functional head is lexicalized by modal verbs and auxiliaries and also functions as a landing site for finite verbs. Jordens (2012) identifies the specifier position of this FP (Spec-FP) as a structural subject position. Hence, this FP combines aspects of the two projections of the target-grammar, CP and IP. In a second extension, FP is divided into a higher CP and a lower IP, *the target stage* illustrated in (20c). The IP is the locus of subject-verb agreement. The C-head is the target of V2-movement in main clauses and complementizers in embedded clauses. Its specifier is the host for topics in main clauses.

(20) a. Lexical stage (≈ L1 stage I)

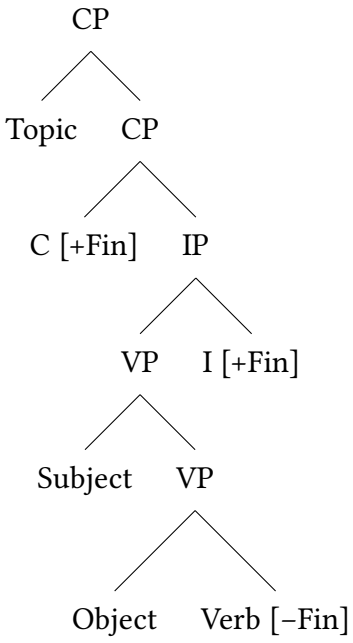


[8] These may roughly corresponding to the sketchy grammar stages in Clahsen & Muysken (1986: 113).

b. Functional stage (≈ L1 stage II)



c. Target stage (≈ L1 stage III & IV)



These idealized structures of the stages of language development account for why children almost never make V3 types errors: They either use a verb-final pattern (lexical stage) or they only have one structural position preceding the finite verb available. The functional structure is therefore more or or less acquired top-down from the CP to the TP.

8.3 Summary

The discussion of the L1-acquisition of V2-order showed that verb placement errors in matrix clauses are very rare. Two observations are indicative: Children (almost) never raise non-finite verbs to higher position and (almost) never produce V3 patterns. This indicates that the dependency of verb movement and finiteness as well as the special nature of the structural preverbal position is set quite early. Overgeneration of matrix clause word order in embedded clauses seems to be subject to individual variation and temporally restricted. The developmental sequences in other V2-languages are comparable. Especially the observation of verb doubling in other V2-languages strengthen the argument that this phenomenon is an indication of verb movement, especially because it involves different base positions in OV and VO languages as expected in a generative model. Figure 8.1 summarizes the main findings from above.

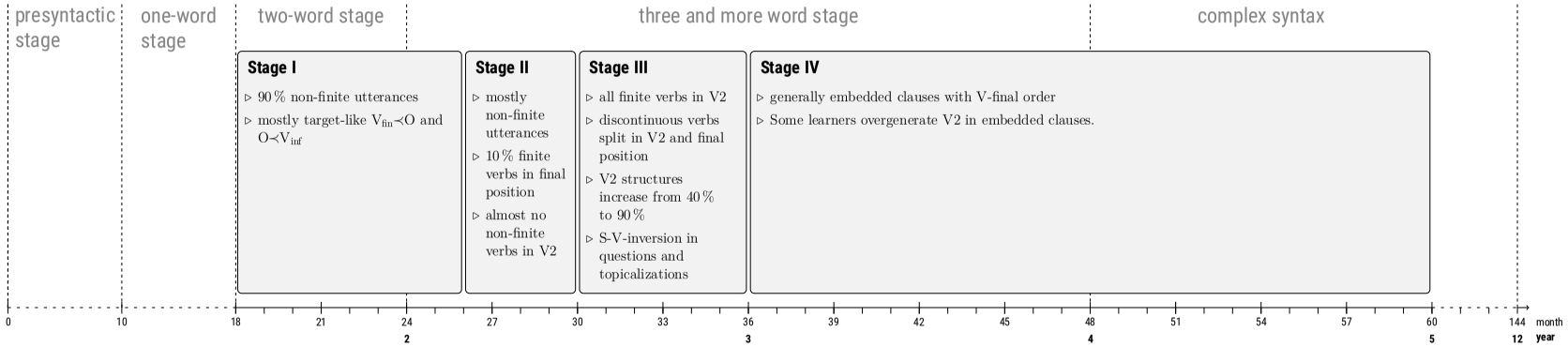


Figure 8.1: Summary of the developmental changes during the L1-acquisition of V2

9 V2 in L2-acquisition

In this section, I will consider second language acquisition (L2-acquisition) as adult L2-acquisition if not explicitly stated otherwise. Adult L2-acquisition means that the acquisition of the second language starts at age 10 or later (Meisel 2009). The *age of onset of acquisition* has been identified as a significant factor in language development. We can roughly distinguish 3 groups of early learners (non-adults): Children who simultaneously acquire more that one language from their first months on qualify as bilingual learners. Children who start to acquire a second language before the age of 4 are classified as early L2-learners. They typically resemble the developmental patterns of L1 children. If the onset takes place between the age of 4–10, the learners are classified as child L2-learners. Their developmental pattern is observed to differ from both bilinguals/early L2-learners and adult L2-learners. The critical age of onset for observing L1-like development might vary for different phenomena, such as the acquisition of grammatical gender vs. the acquisition of word order. The observation that the age of onset of acquisition is a crucial determinant of the developmental process has been formulated in the *Critical Period Hypothesis* (Lenneberg 1967, for further details see Meisel 2009 and references therein). Pierantozzi (2009) discusses correlations of age of onset with word order patterns in child L2-learners of German and French.

I will not go into detail with respect to the age of onset of acquisition, but rather distinguish (idealized) adult L2-acquisition from L1-acquisition. L1- and L2-acquisition processes differ considerably based on the different preconditions. L1-learners somehow start from scratch, whereas L2-learners already have developed a system to express complex thoughts. In this line of reasoning, the L2-learners only have to learn a coding system for structures they can already express in their L1. This includes the acquisition of a lexical and functional vocabulary, but also the grammatical rules to form well-formed utterances. I will not distinguish between guided L2-acquisition, as in a class room setting and unguided (naturalistic) L2-acquisition. The study by Ellis (1989) indicates that the order of the developmental stages is not affected by explicit instructions but only the pace of acquisition.

As in Chapter 8, I will first review the data base and the general observations regarding L2-acquisition of German before I will discuss theoretical analyses. The structure is intended to be as parallel as possible to the L1-discussion to facilitate comparisons, which will be done in Section 9.4.

9.1 Data base

In L2-acquisition we can distinguish two categories of data sources: cross-sectional studies and longitudinal studies. Cross-sectional studies contribute the vast majority of data. Starting with *Heidelberger Pidgin Projekt* (Klein & Dittmar 1979), a considerable amount of

cross-sectional studies and experiments have been conducted with L2-learners of German. Although cross-sectional studies do not allow the detection of changes in the individual's development, the participants may be assigned to different classes according to their language proficiency. This makes it possible to draw conclusions about the developmental process of the individual participants within the population. Additionally, the comparison of learners with different L1s within one cross-sectional studies allows to identify which developmental steps or error patterns are due to language transfer or part of the genuine acquisition process of L2 German.

To my knowledge, only a few longitudinal studies of the L2-acquisition of German exist. The first is the 2-year ZISA study (Clahsen et al. 1983) with Romance learners (Italian, Portuguese and Spanish). The second is the 2.5-year ESF[1] study (Klein & Perdue 1992) investigating L2-German learners with L1 Turkish and Italian. The third is the 1-year VYSA study (Vainikka & Young-Scholten 2011) with 3 English learners of L2 German. The transcripts of the ESF and the VYSA study are available through the TalkBank system (MacWhinney 2007).

9.2 General observations

I will summarize the generalized observations in order to gain a robust picture of the L2-acquisition of word order in German and draw comparisons to the L2-acquisition of other V2-languages. The observations are inspected with respect to two aspects, the developmental steps of mastering correct word order patterns and specific error patterns at each state. It must be noted that the data in each study is usually not very telling, especially in the initial stages, because the utterances are highly ambiguous. As an example, the two-word utterance *Ich esse* 'I eat' can be classified as SV-order, verb second and V-final. It would even count as subject-penultimate if this would be a desirable assumption. Since, especially in the beginning of the acquisition process, learner utterances are comparably short and affected by omission of constituents, only few utterances constitute clear evidence for word order regularities.

9.2.1 Verb placement

In the following, I will combine observations about developmental stages of L2-acquisition of German proposed in Clahsen et al. (1983), Clahsen (1984) and Clahsen & Muysken (1986), based on a cross-sectional analysis and verified by longitudinal data of the ZISA study (Clahsen et al. 1983). Through the inclusion of additional sources, the number and formulation of the individual stages deviate from the above mentioned but still retain the core characteristics. For the sake of completeness, I will mention that prior to stages in which verb-argument order can be distinguished, there might be an *NP-stage* in which learner utterances consist mostly of noun phrases, as reported for L2 Dutch by Coenen & Klein (1992).

L2-stage I is characterized by non-finite utterances with fixed word order patterns. For learners with an verb-initial L1-background (e. g. Romance languages), the word order is

[1] In this project also a longitudinal study of L2 Dutch learners was conducted that is also discussed below (Coenen & Klein 1992).

fixed to the SVO pattern, as in (1). The verbal complex may consist of an auxiliary or a modal verb together with a lexical verb as in illustrated in (1c). Vainikka & Young-Scholten (2011: 135–158) note that such complex verb forms are quite rare in early utterances.

(1) SVO learners: NP ≺ AUX/MOD ≺ V ≺ (NP)/(PP)

a. ich mötte eine sohn
I want.1SG a son
'I want to have a son.' (L1 Italian) (Clahsen et al. 1983: 101)

b. ich nich schlecht gesagt von deutsche
I not bad said.PTCP of Germans
'I do not speak badly of Germans' (L1 Spanish) (Clahsen et al. 1983: 101)

c. ich hab verstehen auch nix
I have.1SG understand.INF also nothing
'I also haven't understood anything.' (L1 Portuguese) (Clahsen 1984: 225)

If those utterances contain adverbials (adverbs and preposition phrases), these are typically placed at the left or right edge. At the left, this is the sentence-initial position, as in (2). This does not affect the position of the verb, resulting in typical V3 error patterns. Alternatively adverbs are placed at the right periphery, i. e. clause-finally, as in (3).

(2) a. vielleicht ich bleiben hier
maybe I stay.INF here
'Maybe I'll stay here.' (L1 Spanish)

b. in Italia viel interessiert die Kinder die Familie
in Italy much interest.3SG the children the family
'In Italy the family is very interested in the children.' (L1 Italian)

(Clahsen et al. 1983: 135)

(3) a. die leute arbeiten hier
the people work.3SG/INF here
'The people work here.' (L1 Spanish)

b. er ist eine vertretung in ausland
he is.3SG a replacement in abroad
'He is a (working as) a replacement abroad.' (L1 Spanish)

(Clahsen et al. 1983: 129)

Clahsen & Muysken (1986: 108–109) argue that this SVO-like pattern is also valid for learners with verb-final L1s, in particular Turkish. However, there is convincing evidence indicating otherwise. Vainikka & Young-Sholten (1994) report that L2-learners of German with L1 Turkish or L1 Korean show a predominant OV pattern in the early stages of acquisition, as illustrated in (4). An initial OV preference is also reported for Turkish children learning L2 German (Haberzettl 2003) and early stages of Turkish adults learning L2 Dutch (Coenen & Klein 1992).

(4) NP ≺ (NP)/(PP) ≺ V

a. Ama ich zwei Jahre Berlin bleiben.
but[Turkish] I two years Berlin stay.INF
'But I stayed (in) Berlin two years.' (L1 Turkish) (Vainikka & Young-Sholten 1994: 280)

b. Ja Frau Türkei muss
yes wife Turkey must.∅-1/3SG
'Yes (my) wife must (go to) Turkey.' (L1 Turkish) (Vainikka & Young-Sholten 1994: 282)

c. Eine Katze Fisch alle essen.
a cat fish entire eat.INF
'A cat ate the entire fish.' (L1 Korean) (Vainikka & Young-Sholten 1994: 280)

d. Katze Maus essen
cat mouse eat
'The cat eats the mouse.' (L1 Turkish, ca. 6 years) (Haberzettl 2003: 48)

However, copula clauses, corresponding to the pattern in (5), are reported for both learner groups irrespective of the head-parameter of the L1-VP. Vainikka & Young-Sholten (1994) interpret these copula patterns as precursors of the next stage.

(5) NP ≺ Cop ≺ ADJ/NP/PP

a. Das ist Atatürk Bild ja.
that is.3SG Atatürk picture yes
'Yea, that's (a) picture (of) Atatürk.' (L1 Turkish) (Vainikka & Young-Sholten 1994: 284)

b. Schnee ist da
snow is.3SG there
'(There) is snow there.' (L1 Korean) (Vainikka & Young-Sholten 1994: 284)

c. aber ist nicht gut für arbeiten
but is3.SG not good for work.INF
'But (this) is not good (at) work.' (L1 Italian) (Klein & Carroll 1992: 129)

L2-stage Ib: Vainikka & Young-Scholten (2011: 142–143, 152–153) suggest that the initial preference for VO-pattern of learners with an verb-initial L1, e. g. Italian, Spanish or English, switches to a preference for OV patterns, as in (6), at the end of this stage.

(6) a. Diese hier Tür zumache.
this here door close.INF/1SG
'This (person) here closes the door.' (L1 Spanish) (Vainikka & Young-Scholten 2011: 143)

b. Die Mädchen immer die Buch lesen.
the girl always the book read.INF
'The girl always reads the book.' (L1 English) (Vainikka & Young-Scholten 2011: 154)

This might be subject to individual variation. At least some speakers, such as the Italian learner Gina (Klein & Carroll 1992), still show head-initial VPs in combination with auxiliaries, as in (7), even though she also uses the target like structures with a head-final VP, as in (8).

(7) a. dann habe gesehen eine *camion* mit der Brot
then have seen a van (ITA) with the bread
'Then I have seen a van with bread.' (L1 Italian)

b. und eine Frau hat gesehen die Mädchen
and a woman has seen the girl
'And a woman saw the girl.' (L1 Italian)

(Klein & Carroll 1992: 157)

(8) a. und dann habe eine Brot gebringe
and then have a bread brought
'And then I have brought a bread.' (L1 Italian)

b. diese Mädchen hat deine Brot gebringt
this woman has your bread brought
'This woman has brought your bread.' (L1 Italian)

(Klein & Carroll 1992: 157)

In **L2-stage II**, a consistent differentiation between finite and non-finite verbal elements takes place (Klein & Carroll 1992). Non-finite parts of discontinuous elements appear in clause-final position, e. g. separable particles of particle verbs, as in (9a), analytic verb forms, as in (9b), and infinitives in verb clusters with modal verbs, as in (9c). Some learners also apply this mechanism to copula constructions, as in (10).

(9) a. die schmeißt mi' schon jetz (r)aus, …
she throws.3SG me already now out
'She kicks me out already now.' (L1 Italian)

b. die schwere worten so hab' ich auf die hand geschrieben
the difficult words PRT have.1SG I on the hand written.PTCP
'So I wrote the difficult word on my hand.' (L1 Portuguese)

c. kann ich selber kaufen
can.1SG I on my own buy.INF
'I can buy (this) on my own' (L1 Spanish)

(Clahsen et al. 1983: 137)

(10) example of *ist gewesen* (Klein & Carroll 1992)

a. ich war + ich war + ich bin gewesen und nicht mädchen
I was.1SG + I was.1SG + I am.1SG been.PTCP and not girl
'It was me and not the girl.' (L1 Italian)

b. ist die mädchen gewesen und nicht diese mann
is.3SG the girl been.PTCP and not this man
'It has been the girl and not this man.' (L1 Italian)
(Klein & Carroll 1992: 138–139)

This stage is also confirmed by the data of learners with L1 Turkish (Cedden & Aydın 2007). Although the finite and non-finite parts of the verb complex appear separately, the error patterns still display a strict SV_{fin} order in which the finite verb follows the subject even when other constituents are placed before the verb, see (11).

(11) a. Außerdem ich kann nicht so romantisch sein.
besides I can.1SG not so romantic be.INF
'I cannot be so romantic.' (L1 Turkish)

b. [Mit einigen Strafen] [die Zahl der Fälle] kann reduziert werden.
with some penalties the number of cases can.3SG reduced.PTCP be.INF
'With some penalties the number of cases can be reduced.' (L1 Turkish)
(Cedden & Aydın 2007: 10)

Further data is provided by Leonini (2003). She reports results from a interview transcript analysis with nine Italian learners of German (18–22 years): All discontinuous verb forms with a finite modal or auxiliary and a non-finite verbal element show a SV_{fin} XP V_{inf} order. Generally 76% (n=92) of the main clauses show a target word order, in which the vast majority of these clauses are SVO (n=78; 85%). Main clauses with incorrect word order (n=29; 24%) show mostly a V3 order with XP SVO order.

Klein & Dittmar (1979: 154–163) report similar results for an analysis of recordings of Romance learners of German. They distinguish between 8 proficiency groups. With increasing proficiency, V2 becomes the more preferred pattern, occurring in (60–90%) of the main clauses. Consequently, V3 patterns of the form XP SVO decrease (30–15%). Also increasing as a function of proficiency is the number of analytic verb forms and the frequency of placing the non-finite part strictly in final position. In fact, low proficiency learners avoid the usage of finite particle verbs altogether but tend to use only the non-separated non-finite form.

In **L2-stage III**, the learners robustly apply V_{fin}S-order[2] in contexts with sentence-initial non-subjects (arguments, adverbials and embedded clauses), as in (12), and in interrogative sentences, as in (13).

(12) a. französich kann ich auch noch heute
French can.1SG I also still today
'I still speak French today.' (L1 Spanish)

b. jetzt kann sie mir eine frage machen
now can.3SG you.PL me a question make.INF
'Now you can ask me a question' (L1 Italian)

[2]This pattern is frequently labeled *subject-verb inversion* (e. g. Clahsen & Muysken 1986: 107). I consider such terminology problematic for an observation because it already implies a specific syntactic analysis.

c. [wenn ich hier rauskommen] kenn ich keine mensch
when I here out.come.INF know.1SG I no man
'When I go out here I don't know anyone.' (L1 Portuguese)
(Clahsen et al. 1983: 141)

(13) was lernt man in literatur?
what learn.3SG one in literature
'What does one learn in literature?' (Clahsen et al. 1983: 141)

In **L2-stage IV**, adverbials are optionally placed clause-internally, between the finite verb and the object, as in (14).

(14) a. da is' immer schwierigkeit
there is always difficulty
'There is alway a difficulty.' (L1 Italian)

b. aber ich habe in Remscheid die zeug gelassen
but I have.1SG in Remscheid the stuff left.PTCP
'But I have left my stuff in Remscheid.' (L1 Spanish)
(Clahsen et al. 1983: 152)

L2-stage V concerns the word order in embedded clauses. In this stage, the finite verb appears in clause-final position, as in (15).

(15) a. und das hab ich [weil ich dahinten schon viel bekannten haben]
and that have.1SG I because I over there already many acquaintances have.INF
'And I have that bacause I already have many acquaintances over there.' (L1 Portuguese) (Clahsen et al. 1983: 353)

Prior to this stage, L2-learners overgenerate, and utter V2-patterns also in subordinate clauses, as in (16), (see also Jansen 2008, Baten & Håkansson 2015).

(16) a. ich denke wann ich haben ein kin in kindergarten. dann lern ich deutsch
I think when I have.INF a child in kindergarden then learn.∅ I German
'I think when I one child goes to kindergarde then I'll learn German' (L1 Spanish)
(Clahsen et al. 1983: 364)

b. … ob sie wollte nach Großmutter gehen
whether she wanted to grandmother go
'…whether she wanted to go to visit her grandmother' (L1 Italian) (Leonini 2003: 10)

c. Und allen Deutsches denken, dass wir haben genug Freunden jetzt.
and all Germans think that we have enough friends now
'And all Germans now think that we have enough friends.' (L1 English) (Vainikka & Young-Scholten 2011: 301)

Leonini (2003) states that, in her corpus, the majority of the embedded clauses (n=26; 68%) do not show a V-final but an SV order. Klein & Dittmar (1979: 163–166) report that the

number of subordinate clauses is very low for low-proficiency learners and increases with proficiency. The less proficient groups only produce non-finite verb forms in subordinate clauses. With increasing proficiency the proportion of finite verb forms increases. Additionally, low-proficiency learners place the verbs of subordinate clauses erroneously in second position in roughly 50 % of the cases. With increasing proficiency the verb-final placement of the verb increases to 100%.

It is not clear which patterns occur in embedded clauses for learners with head-final L1s. Vainikka & Young-Scholten (2011: 273) mention that those learners also produce V2 embedded clauses but they do not provide examples. In contrast, Klein & Carroll (1992: 162–179) mention that the Turkish learners produce mostly target-like subordinate clauses, indicated only by the two examples in (17). In their summary, however, they conclude that subordinate clauses are very rare and do not differ in structure from declarative main clauses, which implies that these exhibit V2-order (Klein & Carroll 1992: 181).

(17) a. Und dann der Chef wollte etwas zeigen, was er machen kann
and then the boss wanted something show what he make can
'And then the boss wanted to show what he can make.' (L1 Turkish)

b. vorher hat er eine Mädchen gesehen, dass sie eine Brot geklaut hatte.
before has he a girl seen that she a bread stolen had
'Before, he has seen a girl who had stolen a bread.' (L1 Turkish)

(Klein & Carroll 1992: 168)

9.2.2 Dummy Auxiliaries

An interesting observation concerns *dummy auxiliaries*. To my knowledge the first description of this pattern stems from Coenen & Klein (1992) in the description of Turkish L2-learners of Dutch and their extended use of the Dutch auxiliary *is* 'is'. As in German, inflected forms of *sein* 'be' can function as copula or an auxiliary for a restricted class of verbs. The characteristics of the dummy-*is* in L2-Dutch are the following:

1. It is lacking proper subject-verb agreement. Despite its superficially inflected appearance the dummy-*is* remains unchanged when it appears with subjects that are not third person singular.

2. It shows no lexical or morphological restrictions. The dummy-*is* also cooccurs with verbs that select the auxiliary *haben* 'have'. Additionally, the dummy-*is* cooccurs with all sort of morphological forms of the corresponding verb, such as participles, infinitives, bare verb stems and even finite, inflected forms, of which only the first are licit structures in the target languages.

The only source of dummy-*is* in L2-acquisition of German is Haberzettl (2003), who reports this use in the interlanguage of Turkish speaking children (6;0 years) learning L2 German. The data stems from free conversations and a picture story telling task. The observed patterns in (18) show the same characteristics, containing an infinitive in (18a), a participle, which selects auxiliary *haben* 'have', in (18b), and a finite verb in (18c).

(18) a. Ein Junge is die Fußball spielen.
a boy is the football play.INF
'A boy is playing (with the) football.' (L1 Turkish, ca. 6 years) (Haberzettl 2003: 45)

b. Der Junge ist so gemacht
the boy is so made.PTCP
'The boy has made (something) so.' (L1 Turkish, ca. 6 years) (Haberzettl 2003: 48)

c. Quack ist nicht Geld kommt [=bekommt]
Quack is.3SG not money gets.3SG
[Quack has attempted a robery.]'Quack did not get the money.' (L1 Turkish, ca. 7 years) (Haberzettl 2003: 55)

Verhagen (2009: 58-62) reports similar cases for Turkish and Maroccan (Arabic) learners of L2 Dutch. Examples for L2 Dutch dummy-*is* are given in (19). The discussion in van de Craats (2009) reveals that dummy-*is* also appears in the interlanguage of children with different L1s who learn English as L2. In her detailed study of Turkish learners of L2 Dutch she also mentions two new patterns, the double realization of dummy-*is*, as in (19c), and the combination of dummy-*is* with a raised thematic verb, as in (19d).

(19) L2 DUTCH

a. De meneer blauw is springen
The mister blue is jump.INF
'Mister blue does jump.' (L1 Moroccan) (Verhagen 2009: 61)

b. hij is komt huis
he is.3SG comes.3SG home
'He comes home.' (L1 Turkish Coenen & Klein 1992: 205)

c. Is papa is niet komen
is.3SG father is.3SG not come.INF
'Father doesn't come.' (L1 Turkish) (van de Craats 2009: 79)

d. Zij is ligt in de boot
she is.3SG lies.3SG in the boat
'She is lying in the boat.' (L1 Turkish) (van de Craats 2009: 77)

Although the dummy-*is* pattern seems to be present in L2-learners of both German and Dutch, most frequently these patterns are reported for Turkish L2-learners of Dutch. Verhagen (2009: 62) also notes that the Moroccan learners produced more modal verbs and significantly less dummy-*is* construction than the Turkish learners. For L2 German, the specific dummy-*is* pattern is only reported for child learners (Haberzettl 2003, Chilla et al. 2013). This begs the questions which the conditions for the development of such a dummy verb pattern are.

Early approaches tried to give functional explanations for the use of dummy-*is*. Verhagen (2009) presents sentence pairs in which the dummy-*is* stands in complementary distribution with a negation. She takes this as evidence that the dummy-*is* marks assertion. This, however, seems very unlikely noting the fact that the dummy-*is* pattern may also involve negations as in (18c) and (19c) above. Haberzettl (2003) and van de Craats (2009) present

robust counterarguments against this hypothesis. They propose that the dummy-*is* pattern is a precursor for the movement pattern. Under this interpretation, dummy auxiliaries are similar to the verb doubling patterns in L1-acquisition of German, see Section 8.1.4. Example (20) represents the only case of verb doubling in the literature on L2 German that I am aware of. And even that example is presented in Vainikka & Young-Scholten (2011) without any further comment about this phenomenon, its context or frequency.

(20) Oder vielleicht ich frage meine Eltern, wenn sie kaufen für mich Alkohol kaufen.
or perhaps I ask my parents when they buy for me alcohol buy.
'Or perhaps I'll ask my parents when they'll buy alcohol for me.' (L1 English) (Vainikka & Young-Scholten 2011: 300)

9.2.3 The role of finiteness, tense and agreement

Parodi (2000) investigates verb placement in L2 German with regard to the acquisition of finiteness/verbal agreement morphology and the distinction between lexical and non-thematic verbs (modals, auxiliaries, and copula verbs) drawing on data from three participants of the ZISA study (Clahsen et al. 1983). She observes that agreement patterns differ between thematic and non-thematic verbs: Non-thematic verbs show a target-like agreement morphology from early stages onwards, whereas thematic verbs show a steady increase of correct agreement patterns. Parodi (2000: 373–376) argues for a systematic correlation between target-like agreement morphology and placement of verbs in relation to the negation, with non-finite verbs following the negation (NEG>V_{inf}), as in (21a), and finite verbs preceding the negation (V_{fin}>NEG), as in (21b). Misplacements, such as negation preceding the finite verb in (21c), are very rare. However, the overall numbers of Parodi's (2000) analysis are rather low, which is a weak point of her generalization.

(21) a. wenn schiedsrichter nich schreiben, versicherung nich bezahl
if referee not write insurance not pay
'if the referee does not write a report, the insurance will not pay' (L1 Italian) (Parodi 2000: 374)

b. ich versteh Michael wirklich nich
I understand.1SG Michael really not
'I really don't understand Michael' (Parodi 2000: 366)

c. aber vielleist nicht will meine chef
but maybe not want.3SG my boss
'but maybe my boss doesn't want to' (L1 Italian) (Parodi 2000: 375)

Supportive evidence for the claim comes from experimental investigations of Turkish L2-learners of German. In a production study Schimke (2009: 91-95) could confirm that (finite) non-thematic verbs consistently precede negation. Although thematic verbs exhibit some errors, a clear split between finite verbs, which precede negation, and non-finite verbs, which follow negation, was found. In an elicited imitation task Schimke (2009: 95-113) observed that participants consistently repaired non-thematic verbs by raising them over the negation.

Additionally, participants changed preverbal non-finite verbs into finite verb forms. These results indicate that the learners had established a relation between finiteness and verb raising.

Comparable results of a split between non-thematic and thematic verbs and a clear correlation between finiteness marking and syntactic placement of the verb with respect to negation are also reported for learners of L2 Dutch by Verhagen (2009).

9.3 Theoretical accounts of the L2-acquisition of V2

Generally, L2-acquisition can be described as a developmental process of an interlanguage grammar, i. e. the learner's representation of the target L2-language. The development starts with an initial state and successively alters the interlanguage grammar. In contrast to L1-acquisition, in which all (healthy) learners attain a steady adult grammar of the target language, L2-acquisition does not always necessarily end with a native-like target grammar. It seems that different learners stop at different points of their development of the interlanguage grammar. It is still debated whether (late) learners are able to achieve native-like competence and performance (White 2000, 2003). Certainly, not all linguistic areas are subject to the same difficulties for learners, for example learners may show native like proficiency with respect to word order but they might never show native-like competence with respect to gender assignment/agreement.

9.3.1 The hypothesis space: An overview

Theoretical accounts of L2-acquisition differ with respect to assumptions about two main properties of the developmental process, the initial state and constraints/conditions on subsequent development. Several accounts have been proposed which differ along these two parameters. They all receive support from empirical data, but not necessarily from comparable classes of phenomena.

A first distinction that affects both the initial state and the subsequent development is the accessibility of *Universal Grammar* (UG) in L2-acquisition. Taking an extreme position, Bley-Vroman (1990) proposed that UG is transformed into a steady (L1) grammar during L1-acquisition. Afterwards, UG is no longer accessible, as an unvalued blueprint. This account is known as the *Fundamental Difference Hypothesis*. The inaccessibility of UG in L2-acquisition is the core argument to explain the difference between L1- and L2-acquisition. As a consequence of this assumption, the initial state for L2-acquisition consists of the steady L1-grammar that is subsequently changed through reparametrization.

Several other accounts assume that UG remains accessible even after L1-acquisition. However, these accounts differ with respect to in how far the initial state of the interlanguage is determined by the L1, which is referred to as *L1-transfer*. In the literature, three degrees of L1-transfer have been distinguished: full, partial and no transfer. Schwartz & Sprouse (1996) proposed that the initial state of the interlanguage equals the L1-grammar. Subsequently, the interlanguage will be reparametrized according to UG. This has become known as the *Full Transfer/Full Access Model*. Taking the other extreme position, some authors have proposed

that the initial state of L2-acquisition is UG, as in L1-acquisition, such as the *Initial Hypothesis of Syntax* (Platzack 1996) and the *Full Access Hypothesis* (Epstein et al. 1996). Two accounts take an intermediate position and assume only a partial L1-transfer, basically only for the lexical categories. The *Valueless Feature hypothesis* (Eubank 1993a) assumes that higher functional structure is present but unvalued. In a similar fashion, the *Minimal Trees* (Vainikka & Young-Sholten 1994) and its successor, the *Organic Grammar* (Vainikka & Young-Scholten 2011), assume that functional structure is not present initially but develops subsequently.

Generally, all these accounts build on an understanding of UG and syntactic structures in a fashion of the Principles and Parameter framework. A characteristic of this framework, which has led to serious criticism thereof, is the freedom in postulating principles and complex constraints. It seems to me that a reformulation of the above mentioned accounts in terms of a contemporary, economy driven minimalistic grammar is (almost) impossible. Furthermore, the above mentioned accounts make different predictions with respect to the initial state of learners varying in their L1 (transfer). As White (2003) illustrates, claims about the initial state are hard to falsify. Findings from early learners can always be argued to be post-initial state observations. Hence, we can only draw conclusions from predictions concerning the developmental process illustrated by the developmental steps and respective error patterns, which may differ considerably too.

One account appears to differ considerably from the above mentioned ones, the *Processability Theory* (Pienemann 1998). As the name suggest, this theory focuses on aspects of performance and not on the modeling of linguistic competence. Pienemann (1998: 73–88) formulates a supposedly universal hierarchy of processing procedures, which he derives from assumptions about the general architecture of the human language processing apparatus. The basic idea is that L2-learners have to learn subroutines starting from the lexicon (lemma access), through the phrasal level, to the sentential level. The acquisition of these procedures are ordered in a hierarchical (and chronological order) based on the assumption that the procedures of each lower level are prerequisites for the successful application of higher order routines. However, within the sentential level, Pienemann (1998) merely stipulates successive developmental steps in accordance with the observations of L2-development, presented in Section 9.2.1, which may be partially motivated by processing routines but cannot be derived from them. Additionally, Pienemann (1998) assumes that the embedded clause word order is acquired last by implementing a specific embedded clause processing routine. I cannot see how main clauses can be distinguished from embedded clauses without resorting to grammatical representations. Generally, I consider the processability theory a grammatical theory in disguise.

In the following, I will discuss the relevant accounts with respect to the data of L2-acquisition of German word order, in particular the placement of verbal elements.

9.3.2 The role of L1-transfer in the L2-acquisition of German

The observations presented in Section 9.2.1 indicate that L1-transfer does in fact take place in the L2-acquisition of German. The order of object and verb that learners produce in the L2-stage I corresponds to the order of their L1, i. e. English and Romance native speakers produce VO structures whereas Turkish and Korean native speakers produce OV structures.

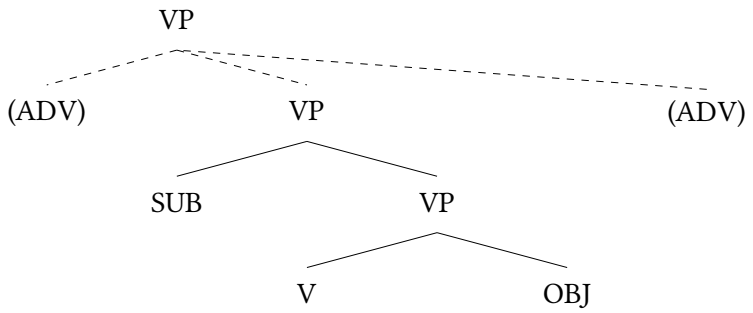
However, the data does not imply that transfer goes beyond the VP structure. Håkansson (2001) and Håkansson et al. (2002) argue against the full transfer hypothesis based on two studies with Swedish L2-learners of German. They report that Swedish learners do not seem to transfer the V2-rule into German but systematically produce V3 structures in which adverbs precede the subject and the verb. However, this only shows that learners might not transfer an abstract rule, such as V2-placement in isolation. Note that Swedish differs from German already at the level of the lexical phrases, exhibiting a VO order instead of a OV order. A plausible hypothesis would be that L1 is bound to a hierarchy principle: Structural properties may be transferred on several/all layers but starting at the lowest level (VP) until a point of divergence, i. e. a point at which the transferred structure does not result in target structures. For the transfer of V-to-C structures, this might be observable in L2-acquisition of German by L1-speakers of Dutch and vice versa, and speakers of Scandinavian languages inter alia. L2-investigations of these language combination have never come to my attention. They would provide interesting test cases.

9.3.3 The role of functional categories in the L2-acquisition of German

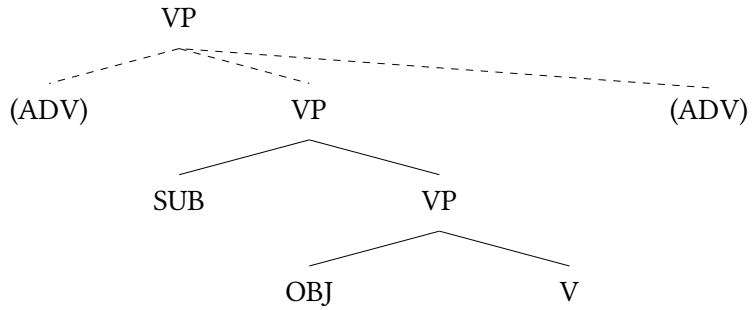
Despite the different assumptions regarding the initial state and the role of L1-transfer, there is a large consensus in the literature about the grammatical representations of the L2-stages described above. The markup of the functional projections is the crucial factor that determines word order regularities in German. I will present a generalized representation of suggestions in Clahsen & Muysken (1986), Eubank (1992), and Vainikka & Young-Scholten (2011). These differ somewhat in formalization, labeling, and minor assumptions but the core idea is identical.

The initial L2-stage I can be modeled with a VP structure, which hosts subject, object and verb. The headedness of the VP may be subject to L1-transfer. Therefore, the structure in (22a) corresponds to VO-learners and the structure in (22b) to VO-learners respectively. The dashed lines indicate that adverbials may be adjoined to the right or to the left of the VP.

(22) a.



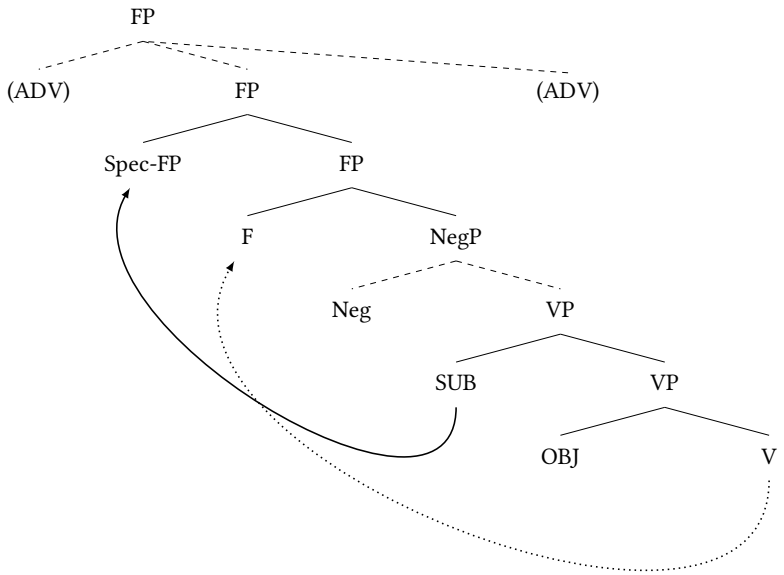
b.



The observation that copula constructions yield a uniform NP ≺ Cop ≺ ADJ/NP/PP pattern irrespective of the L1 either indicates that the learners already have a functional projection at their disposal, or that they use a formulaic frame in which the subject and the predicative element are inserted without a sophisticated grammatical representation. Furthermore, if, as assumed by Vainikka & Young-Scholten (2011), VO-learners of German switch to VO at the end of L2-stage I, they change their structure hypothesis from (22a) to (22b).

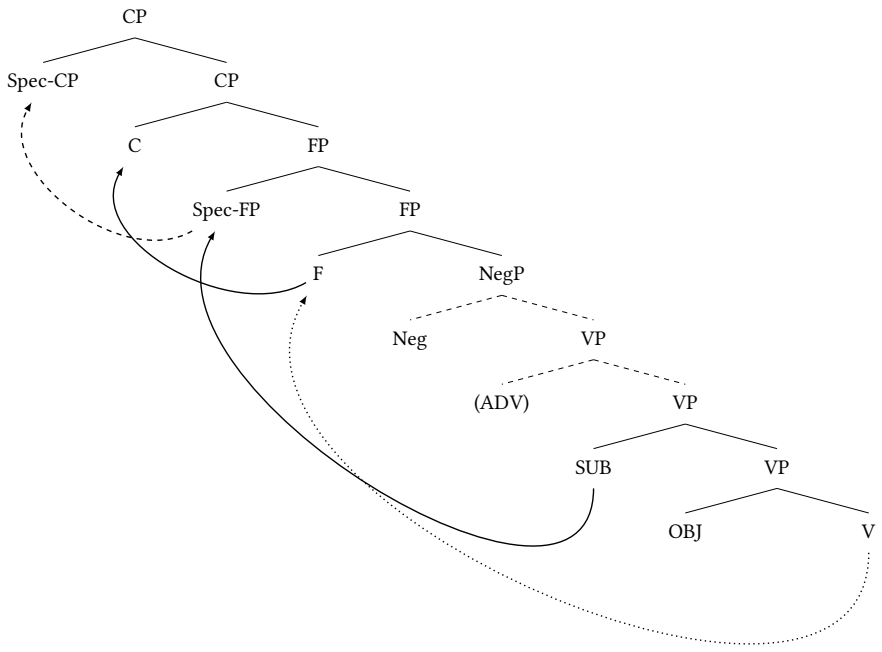
At the latest in L2-stage II, the grammar exhibits a functional phase above the VP. This phrase is consistently lexicalized by auxiliaries and modal verbs in discontinuous verb forms and verb clusters. Additionally, finite verbs are increasingly raised into this position, which also enables the separation of particle verbs. This functional position, which I labeled FP in accordance with the description in L1-acquisition in Section 8.2, can be initially filled by an underspecified element, such as the dummy auxiliaries discussed in Section 9.2.2. Subsequently, the position is more and more identified with tense, and also with subject-verb agreement. Because of this gradual increase of correct agreement morphology and verb raising, Eubank (1992) and Vainikka & Young-Scholten (2011) assume two separate functional phrases, a TP and an AgrP. In light of contemporary syntactic theory, this specification can be realized by one syntactic head encoding several features. As indicated by the tree in (23), not only the finite verb raises but also the subject. The dotted line for the verb raising indicates that the lexical verb only moves if there is no modal or auxiliary in F. Similar to the previous stage, adverbials are adjoined to the top node, which leads to erroneous V3 patterns. Additionally, this structure gives a good description of the distribution of non-thematic and thematic verbs and the negation under the assumption that negation is posited above the VP.

(23)



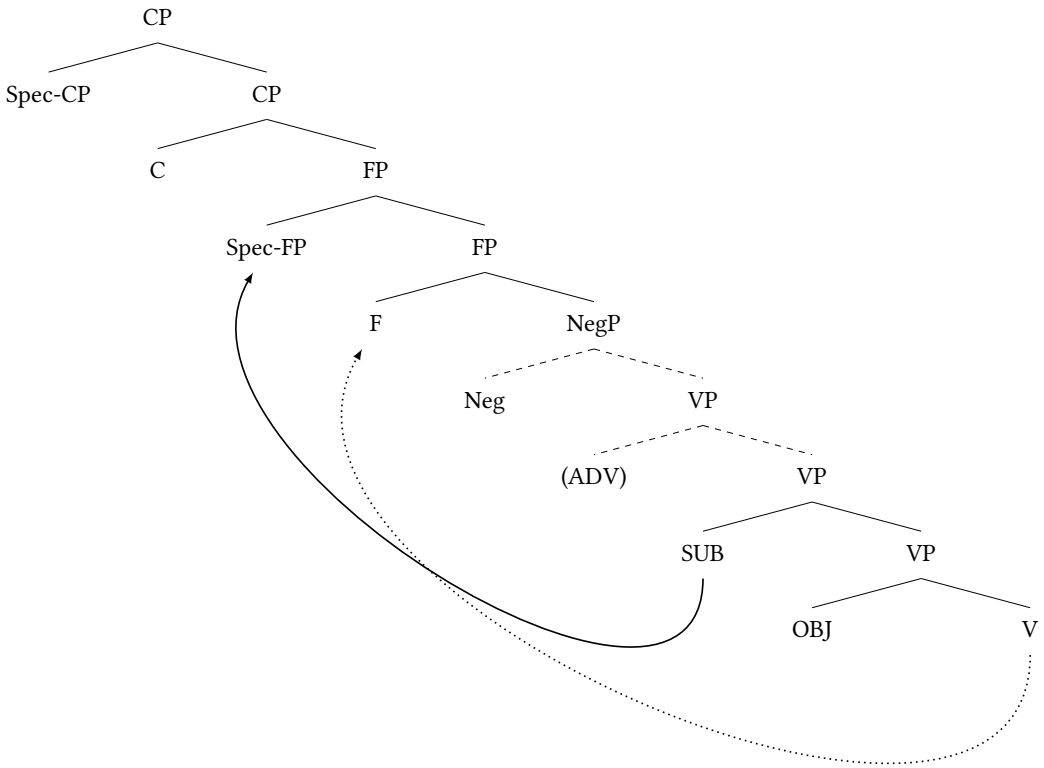
In L2-stage III the structure is once more extended by an additional functional phrase, a CP, as shown in (24). This now allows proper V2-order in non-subject-initial sentences. The optional movement of the subject to Spec-CP, which only applies in subject-initial root clauses, is indicated by the dotted arrow.

(24)



This structure also accounts for the SVO order in embedded clauses, as illustrated in (25). The C-head is filled by a lexical complementizer. Hence no movement to the C-domain applies. The result is an embedded clause as in (26). The example also illustrates a further change, formulated by L2-stage IV, namely that adverbials appear clause internally.

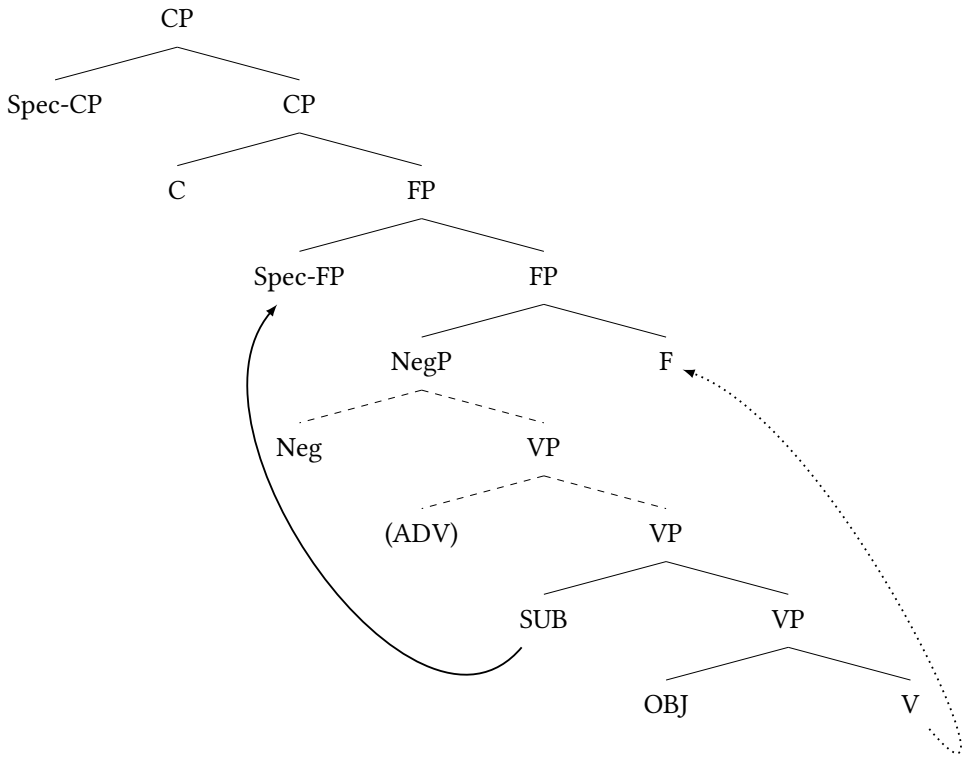
(25)



(26) Wir haben beschlossen, dass wir wollen [in die Ferien]$_{ADV}$ irgendwo treffen.
we have decided that we want in the vacation somewhere meet
'We've decided that we want to meet somewhere during the vacation.' (L1 English)
(Vainikka & Young-Scholten 2011: 302)

In the final adjustment the learner changes the directionality of the functional projection to head-final, as in (27). Corresponding to L2-stage V, this produces target-like V-final embedded clauses.

(27)



9.4 Summary and comparison with L1-acquisition

The discussion of the L2-acquisition of German word order has shown that it proceeds through four basic steps that can be modeled by successive extension and a final readjustment of the phrase structure hypotheses of the L2-learner. The developmental path exhibits several parallels to the L1-acquisition. Starting with the VP-level, it was argued that L2-learners, may transfer the OV order from their L1. This way, OV-native speakers assumably start out with a similar base structure as L1-learners. Learners with a verb-initial L1, seem to consistently begin with a non-target-like SVO order that is superficially similar to subject-initial V2-clauses. That these structures differ from the target language is indicated by erroneous V3 patterns with clause-initial adverbials.

In L1- and L2-acquisition, this base structure will be extended by a head-initial functional phrase. In both cases, the functional head is initially lexicalized by auxiliaries and modals. In L2-acquisition this lexicalization is sometimes realized by dummy auxiliaries. With the emergence of morphological marking of finiteness, the placement of finite verb into this functional phrase increases. At this point, the consistent separation of analytic verb forms and the separation of particle verbs is established. One apparent difference seems to be that L1-learners place adverbials after the finite verb, whereas L2-learner still place them at the clausal periphery giving rise to erroneous V3 patterns.

For both groups, a second extension of the functional structure takes place. In L1-acquisition this seems to apply by an insertion of a head-final IP between the VP and the head-initial functional phrase. This transitions may be accompanied by verb doubling. In L2-acquisition, the extension proceeds by adding a further head-initial phrase. This leads to target-conform structures in main clauses, whereas embedded clauses show a non-target like V2-pattern. Note that such error patterns have also been reported for some individuals in L1-acquisition, see Section 8.1.2, which may indicate that some L1-learners assume a non-optimal extension of functional structures. However, for L2-learners this seem to be an obligatory developmental stage.

In a final change, the L2-learner has to adjust the headedness of the lower functional projection from head-initial to head-final. Only then, embedded clauses appear target language-conform with the finite verb in clause final position. For L1-learners this readjustment seems to be accompanied by verb doubling patterns in embedded clauses.

In sum the most crucial difference between L1- and L2-acquisition is the headedness of the lower functional category, corresponding to the IP. With increasing evidence, it seems very probable that the order on the lexical level, i. e. the VP can be transferred from the L1. An open question remains whether L2-learners are also able to transfer properties related to the functional structure.

10 Experimental investigations of verb placement in L2-German

This chapter reports the result of four psycholinguistic experiments that investigate the processing-related aspect of the L2-acquisition process. The hypotheses of the experiments connect thoughts that have been discussed in the previous chapters, of course in an idealized and simplified fashion. The experiments focus on the mastering of basic word orders of German.

In Chapter 3 and Part II, I argued that the comprehension process of V2-clauses by native speakers involves V-final routines (V2-Reconstruction Hypothesis). Similarly the review of the L1-acquisition of German in Chapter 8 showed that V-final patterns are acquired first. Based on these observations, I hypothesize that V-final parsing routines are a prerequisite for successful parsing of V2-clauses in German. The discussion of L2-acquisition showed that a description in terms of phrase structure hypotheses about the VP and its functional extension (IP, CP) is well-suited to describe the developmental process and predict typical error patterns. Additionally, we found evidence that learners initially transfer the basic word order parameters (headedness of V and I) from their L1 into the interlanguage grammar. In the most simple way, I will relate the grammatical knowledge with the parsing routines, see Chapter 4 for details. This allows us to formulate clear hypotheses that make sharp predictions and which can be tested against experimental results.

The prediction goes as follows: Learners of a V-final (head-final) language transfer the parsing routines for OV-order and maybe also for the head final IP. Learners of an V-initial (head-initial) language must develop parsing routines for OV order and also the head-final IP. The actual V2-movement, i. e. V-to-C movement must be acquired by both groups alike. Therefore, we expect that learners with a head-final L1 will show a better performance for embedded clauses in German, because these conform to the native structures and therefore to the parsing routines. In addition, we expect that learners of a head-initial L1 show relatively more problems because at the beginning of the learning process they lack the target-like structures/parsing routines. I will call this the *functional transfer hypothesis*.

In order to determine that the experimental results correlate with a developmental process, we need at least two observations from different states of L2-learning. Comparison of theses two states then allows us to determine whether there is development and whether it points in the predicted direction. If the development shows a uniform pattern irrespective of the L1s, this indicates that learners do not transfer functional structures. I will call this the *functional development hypothesis*.

The experiments in Section 10.2 and 10.3 focus on the production site. The other two experiments investigate the comprehension-related responses (Section 10.4 and 10.5). Additionally the experiments vary along other variables, such as time pressure, explicitness of

linguistic intention, and involved sentence types. The experiments in this section are serialized according to decreasing explicitness of the linguistic aspect for the participants. In experiment 6, participants were fully aware that word order plays an important role in the response whereas in the sentence matching tasks word order played no role in the task.

10.1 General remarks about the L2-experiments

10.1.1 The L2-participants

Four groups of L2-learners of German participated in the experiments below. These groups are classified according to a 2×2 matrix. Factor 1 is the native language (L1): One cohort consists of Indian learners who were all students of German at the *Jawaharlal Nehru University* (JNU) in New Delhi. Those participants often had more than one native language. Crucially, all of the native languages are OV languages and none of it is a V2-language.[1] A list of these L1s is given in Table 10.1. The second cohort consists of students of German at the *University of Verona* (UVR). All of these participants specified only Italian, a VO language, as their native language. Each L1-cohort consists of two subgroups that differ in their proficiency level approximated by the duration of study at the university. A broad overview of the learner groups is given in Table 10.2.

Table 10.1: First languages of the Indian participants at JNU

Language	**word order**	**(Sub-)Family**	**ISO 639-3**
Hindi	SOV	Indo-Aryan	hin
Bangla	SOV	Indo-Aryan	ben
Bhojpuri	SOV	Indo-Aryan	bho
Garhwali (Uttrakhendi)	SOV	Indo-Aryan	gbm
Haryanvi	SOV	Indo-Aryan	bgc
Ladakhi (Bhoti)	SOV	Sino-Tibetan	lbj
Magahi	SOV	Indo-Aryan	mag
Marathi	SOV	Indo-Aryan	mar
Panjabi	SOV	Indo-Aryan	pan
Sindhi	SOV	Indo-Aryan	snd
Sylheti	SOV	Indo-Aryan	syl
Tamil	SOV	Dravidian	tam
Tibetan	SOV	Sino-Tibetan	bod
Urdu	SOV	Indo-Aryan	urd

The total number of participants (n=60) indicate that the UVR-low group, i. e. the low-proficiency Italian learners, is severely underrepresented. The participation in the experiments was totally voluntarily. During the stay in Verona only five students from this group

[1] Only one participant (B15) also specified English as one of four L1s, of which only English is head-initial.

Table 10.2: Overview of the L2-participant groups

	L2-proficiency	
	low	**high**
JNU (OV-L1, Indian)	3rd semester B. A., n=21	M. A. students (>6th semester), n=20
UVR (VO-L1, Italian)	4th semester B. A., n=5	6th semester B. A., n=14

decided to participate. Table 10.3 provides some more background data on the participant groups. The groups are comparable with respect to age distribution and the years of studying German in university. The groups differ, however, notably in two respects. First the Indian learner groups show a balanced gender distribution whereas the Italian groups almost exclusively female learners participated. Second, and probably more important, the groups differ in their pre-university German lessons. The Italian learners took on average 5–6 years German lessons in school. For the Indian learners on the other this only amounts to an average of less than one year because only three student took German lessons at school at all. The participant list with details about the acquisition biography is given in the appendix.

Table 10.3: Data concerning the acquisition biography of the L2-participants per group

	age (mean)	female	years of acq.	years at school (ratio)	years at university	count
JNU-high	20–26 (22)	55%	4.6	0.4 (15%)	3.6	20
JNU-low	18–23 (20)	43%	1.5	0 (0%)	1.4	21
UVR-high	21–25 (22)	93%	8.7	5.2 (79%)	3.0	14
UVR-low	20–21 (20)	100%	8.8	6.6 (100%)	2.0	5

10.1.2 The testing environment and procedure

Each participant completed all four experiments in a single experiment session. The order of the experiments was always identical. The first experiments were sentence matching tasks (Experiments 8 and 9). Subsequently, I conducted the elicited production task (Experiment 6). Thereafter, I filled out the participant information form, together with the participants in an informal interview. This tasks provided a little pause for the participant. The elicited imitation task (Experiment 7) was the last part. The elicited production task and the elicited imitation task involved the same sentences (with the same lexemes). During the production task, the participants could read the materials without time pressure. I suspected that if participants did not know any of the lexemes, they would ask. Opting for this order thereby

minimized the probability that the participants would encounter an unknown lexeme in the final imitation task.

Sessions took approximately one hour for fast participants and up to two hours for slow participants with an average of 1.5 hours. All instructions were given in German. If there were serious problems of understanding regarding the instruction or during the interview, we switched to English.

The students at the JNU received a reimbursement of ₹ 350 (Indian Rupees), approximately 5 € for participation at the complete session. The students at the University of Verona received 10 € for participation.

10.2 Experiment 6: Word order in embedded clauses (elicited production task)

10.2.1 Rationale

In this production experiment, participants should utter complex sentences that contain an embedded clause. The main focus of the experiment was the mastering of the V-final embedded clause word order in German. Therefore the experiment materials must not prime the participants for this word order. To prevent this, the visual presentation consisted only of main clauses in main clause word order. Participants were asked to combine these into one complex sentence.

Using a production task, I intended to tap into the processing routines of the participants which assumably reflect the learner's grammar. I suspected that oral production is more spontaneous and that the participants would therefore produce more learner specific errors than e. g. in a written task in which the participants presumably apply a longer and more thorough planning phase followed by a visual feedback of the output.

This experiment focuses on the automatization of the different word orders in matrix and embedded clauses in German. Especially if the learners show different answer patterns for different types of embedded clauses, this may also be an indication that learners derive structural properties from the semantic/pragmatic status of the clauses. Additionally the clauses may also appear in reverted order to prevent participants from applying a V2–V-final pattern without interpreting the sentences. Inverting the order is also a suitable diagnostic to identify whether participant use a V2-routine or a SVO-routine: If the matrix clause appears sentence-initial, the matrix subject may precede the finite verb. If, however, the embedded clauses appears sentence-initial, only the embedded clauses precede the finite verb whereas the matrix subject always follows it.

According to the transfer hypotheses outlined above, I formulate the following predictions as a function of the headedness of the native languages of the participants. The JNU-group (V-final) has an advantage for uttering the embedded V-final order. This might go as far as overgenerating this word order. Therefore I expect few errors in embedded clauses and maybe V-final order in matrix clauses. No mistakes are expected with respect to the linearization of verb and object because native and target language are strictly OV. The UVR-group (SVO), on the other hand, will overgenerate SVO-structures in the embedded clauses and

non-subject-initial matrix clauses (sentence-initial embedded clause). Consequently I expect more errors in these clause types. Subject-initial clauses should not constitute any problems for the UVR-learners because they partly conform to their L1-structures. Additionally, I expect that the Italian learners may produce erroneous VO structures, as transfer effect from their L1.

Furthermore, I expect also proficiency correlated effects. Most prominently, low proficiency learners will make more mistakes than more advanced learners. Possibly low proficiency learners may also show clause type specific problems that are undetectable in the advanced learner performance.

Despite these expectations this study additionally has an exploratory character which is due to the fact that, as far as I know, no comparable study exists.

10.2.2 Method

Participants

The participants are described in detail in Section 10.1.1.

Procedure

The participants saw a paradigm on the screen, as illustrated in (1): two simple sentences (1a) and (1c) together with a phrase that indicates the relation between the two clauses (1b). The participants were instructed to tell in one sentence what has happened (1d). Finally, the presentation included a form with gap lines and the complementizer, as in (1e). Example (2) presents the target utterance which the participants were supposed to produce. This target utterance was not presented on the screen.

(1) a. The parents believed something.
b. And in fact the following:
c. The boy has paid for the chocolate.
d. Please state in one sentence what has happened:
e. _____ that _____.

(2) **Intended answer**
The parents believed that the boy paid for the chocolate.

To prevent participants from only producing the V2 matrix clause pattern and V-final embedded clause pattern in an automated strategy, we varied the order of matrix and embedded clause in the gap form. Details are given below.

After a written instruction, participants received 16 practice items to become acquainted with the task. The practice items involved all sentence types of the experimental conditions with both orders of matrix and embedded clause. This was to ensure that the participants comprehended the task and correctly identified the presented gap forms. During the practice trial, the experimenter gave feedback to the utterances of the participants and selected the subsequent item. The 48 experimental items were randomized by the experiment software.

This experiment did not involve any filler items. After giving the response, the participants selected the next item by clicking on a button on the keyboard. The experiment took 20 minutes on average. The procedure was programmed in the python experiment suite *PsychoPy* (Peirce 2007, 2009) and run on a laptop (OS Linux Ubuntu). The responses of the participants were recorded with a *Olympus LS-5* PCM recorder.

Materials

The experimental stimuli consisted of 48 items varying in eight different clause types with six lexicalizations each. Each item was presented either in a matrix clause ≺ embedded clause or in an embedded clause ≺ matrix clause order. One example item for each of the eight clause types is given in (3)–(10). The instruction line was identical for all stimuli and is only given once in (3d). Intended target utterances are given in square brackets.

(3) **Declarative clause**

a. Die Eltern haben etwas geglaubt.
the parents have something believed
'The parents believed something.'

b. Und zwar Folgendes:
and in fact following
'And indeed the following:'

c. Der Junge hat die Schokolade bezahlt.
the boy has the chocolate paid
'The boy has paid for the chocolate.'

d. Bitte erzähle mit einem Satz, was passiert ist:
please tell with one sentence what happened is
'Please state in one sentence what has happened:'

e. MC≺EC: _____, dass _____.
[Die Eltern haben geglaubt, dass der Junge die Schokolade bezahlt hat.]
the parents have believed that the boy the chocolate paid has
'The parents believed that the boy paid for the chocolate.'

f. EC≺MC: Dass _____, _____.
[Dass der Junge die Schokolade bezahlt hat, haben die Eltern geglaubt.]
'That the boy paid for the chocolate, did the parents believe.'

(4) **Polar interrogative clause**

a. Der Vater hat etwas nicht gewusst.
the father has something not known
'There was something the father didn't know.'

b. Nämlich, ob Folgendes wahr ist:
namely, whether following true is
'Namely, whether the following is true:'

c. Der Nachbar hat den Hund getötet.
the neighbor has the dog killed
'The neighbor has killed the dog.'

d. MC≺EC: _____, ob _____.
[Der Vater hat nicht gewusst, ob der Nachbar den Hund getötet hat.]
the father has not know whether the neighbor the dog killed has
'The father didn't know whether the neighbor killed the dog.'

e. EC≺MC: Ob _____, _____.
[Ob der Nachbar den Hund getötet hat, hat der Vater nicht gewusst.]
whether the neighbor the dog killed has has the father not known
'Whether the neighbor killed the dog, the father didn't know.'

(5) ***Wh*-interrogative clause**

a. Der Polizist hat etwas untersucht.
the policeman has something investigated
'The policeman investigated something.'

b. Und zwar Folgendes:
and in fact following
'An in fact the following:'

c. Wer hat die Diamanten gestohlen?
who has the diamonds stolen
'Who stole the diamonds'

d. MC≺EC: _____, wer _____.
[Der Polizist hat untersucht, wer die Diamanten gestohlen hat.]
the policeman has investigated who the diamonds stolen has
'The policeman investigated who stole the diamonds.'

e. EC≺MC: Wer _____, _____.
[Wer die Diamanten gestohlen hat, hat der Polizist untersucht.]
who the diamonds stolen has has the policeman investigated
'Who stole the diamonds, the policeman investigated.'

(6) **Temporal adverbial clause**

a. Die Kollegin hat einen Tee gekocht.
the colleague has a tea boiled
'The colleague prepared (a) tea.'

b. Davor ist Folgendes passiert:
prior to that is following happened
'Prior to that the following happened:'

c. Der Kunde hat den Raum verlassen.
the customer has the room left
'The customer left the room.'

d. MC≺EC: _____, nachdem _____.
[Die Kollegin hat einen Tee gekocht, nachdem der Kunde den Raum verlassen
the colleague has a tea boiled after the customer the room left
hat.]
has
'The colleague has prepared (a) tea after the customer had left the room.'

e. EC≺MC: Nachdem _____, _____.
[Nachdem der Kunde den Raum verlassen hat, hat die Kollegin einen Tee
after the customer the room left has has the colleague a tea
gekocht.]
boiled
'After the customer had left the room, the colleague prepared (a) tea.'

(7) **Causal adverbial clause**

a. Die Mutter hat gelacht.
the mother has laughed
'The mother laughed'

b. Der Grund dafür ist:
the reason for it is
'The reason for it is:'

c. Der Sohn hat einen Witz erzählt.
the son has a joke told
'The son told a joke.'

d. MC≺EC: _____, weil _____.
[Die Mutter hat gelacht, weil der Sohn einen Witz erzählt hat.]
the mother has laughed because the son a joke told has
'The mother laughed because the son had told a joke.'

e. EC≺MC: Weil _____, _____.
[Weil der Sohn einen Witz erzählt hat, hat die Mutter gelacht.]
because the son a joke told hat has the mother laughed
'Because the son had told a joke the mother laughed.'

(8) **Concessive adverbial clause**

a. Der Mechaniker hat den Motor repariert.
the mechanic has the engine repaired
'The mechanic repaired the engine.'

b. Und trotzdem gilt:
and nevertheless holds
'And nevertheless it holds:'

c. Das Auto fährt nicht mehr.
the car drives not anymore
'The car doesn't run anymore.'

d. MC≺EC: _____, obwohl _____.
[Das Auto fährt nicht mehr, obwohl der Mechaniker den Motor repariert
the car drives not anymore although the mechanic the engine repaired
hat.]
has
'The car doesn't run anymore although the mechanic did repair the engine.'

e. EC≺MC: Obwohl _____, _____.
[Obwohl der Mechaniker den Motor repariert hat, fährt das Auto nicht mehr.]
although the mechanic the engine repaired has drives the car not anymore
'Although the mechanic did repaire the engine, the car doesn't run anymore.'

(9) **Conditional clause**

a. Der Student kann die Miete bezahlen.
the student can the rent pay
'The student can pay the rent.'

b. Voraussetzung dafür ist Folgendes:
precondition for it is following
'The precondition for this is the following:'

c. Die Tante hat das Geld überwiesen.
the aunt has the money transferred
'The aunt has transferred the money.'

d. MC≺EC: _____, wenn _____.
[Der Student kann die Miete bezahlen, wenn die Tante das Geld überwiesen
the student can the rent pay if the aunt the money transferred
hat.]
has
'The student can pay the rent if the aunt has transferred the money.'

e. EC≺MC: Wenn _____, _____.
[Wenn die Tante das Geld überwiesen hat, kann der Student die Miete bezahlen.]
if the aunt the money transferred has can the student the rent pay
'If the aunt has transferred the money the student can pay the rent.'

(10) **Relative clause**

a. Der Junge hat das Fahrrad verloren.
the boy has the bike lost
'The boy lost the bike.'

b. Und das Fahrrad:
and the bike
'And the bike:'

c. Das hat der Großvater repariert.
that has the grandfather repaired
'That (bike), the grandfather has repaired.'

d. MC≺EC: _____ verloren, das _____.
[Der Junge hat das Fahrrad verloren, das der Großvater repariert hat.]
The boy has the bike lost that the grandfather repaired has
'The boy lost the bike that the grandfather has repaired.'

e. EC≺MC: _____, das _____, verloren.
[Der Junge hat das Fahrrad, das der Großvater repariert hat, verloren.]
the boy has the bike that the grandfather repaired has lost
'The boy lost the bike that the grandfather has repaired.'

Data analysis

The recordings were first[2] cut into single stimuli files. These files provided the input for a semi-automated annotation process that presented a predefined form to the annotator and automatically saved the annotation into a text-based table. These steps were executed using the GUI and scripts of the phonetics software *Praat* (Boersma & Weenink 2017). An overview of the annotation scheme is given in Table 10.4.

The annotation table was analyzed using the statistic software *R* (R Core Team 2015). Prior to analysis all 23 empty cells were removed (0.8% of the data). These cells resulted from items that have been (accidentally) skipped during the experiment, i. e. no oral response was given. Because of the different group sizes and the resulting difference in number of observations, I report only proportional values especially in the data plots. I will, however, give absolute number in the text or legend of the plot when necessary. Where I report the results of (generalized) linear mixed-effects models below, theses were carried out using the *lme4* package (Bates et al. 2013). Following the arguments in Barr et al. (2013) and Bates et al. (2015), I fitted mixed-effects models with the simplest justifiable random-effect structure.

10.2.3 Results

Proficiency differences

In general, the participant performed very good, i. e. error rates are very low. The proportions of the mistakes are displayed in Figure 10.1. As expected, the more proficient learners show lower error rates across the different categories. However, this pattern is less evident for the UVR-group. Due to the low number of participants especially in the UVR-low group the data might not be representative. The four right panels indicate that errors relating to the inflection morphology of the verbal elements are almost absent. The first panel indicates that ungrammatical responses are also very rare. Highest error rates occur within the clause assignment class. Interchanging the embedded and the matrix clause leads in many cases to nonsensical utterances. Therefore the nonsensical answers are also comparably high. Almost all cases of argument structure errors stem from not eliding the *etwas* 'something' in structures with argument clauses, see (3)–(5) above, thereby providing a superfluous argument in

[2] All audio files that were recorded in stereo have been transformed into mono using the open-source command line utility *Sound eXchange* (SoX). This software was also used to apply a noise-filter to the recording of participant A01. Curiously, this was the only recording that was extremely noisy.

Table 10.4: Annotation scheme for Experiment 6 (elicited production task)

ID	possible values	comments
attempts	[1, ..., n]	(attempts: starting an utterance with repeating a clause-initial phrase, usually subject DP or conjunction + subject DP. As an example, if you have *... dem Bruder gesagt, dass der Vater den ...+... dass der Vater den Jungen gesehen hat* = new attempt. *... dass der Vater den ...+... den Jungen gesehen hat* = **not** a new attempt. In cases where it is hard to decide, for a new attempt at least two lexical phrases have to be repeated.)
grammaticality	[yes, no]	(is the string grammatical, despite the meaning?)
sense	[yes, no]	(does it make sense?)
clause.order	[MC-EC, EC-MC]	(The embedded clause (EC) is taken as the clause introduced by an complementizer, *wh*-pronoun, or relative pronoun. Is it the first or second clauses?)
clause.assignment	[correct, switched]	(Does the assignment of the propositions to matrix and embedded clause match the target, i. e. the intended interpretation?)
MC.finite.verb.position.ultimate	[V2, Vfinal, both, other]	(count correct position in the final attempt)
MC.finite.verb.position.interim	[none, V2, Vfinal, both, other]	(count correct position, in the initial or other non-final attempts, if the position differs from the final realization.)
EC.finite.verb.position.ultimate	[Vfinal, V2, both, other]	(count correct position in the final attempt)
EC.finite.verb.position.interim	[none, V2, Vfinal, both, other]	(count correct position, in the initial or other non-final attempts, if the position differs from the final realization.)
arguments	[correct, etwas, missing, superfluous]	(*etwas* is actually a frequent subclass of *superflous*, in which the participant didn't omitted the *etwas* when inserting the subordinate clause)
lexical.replacement	[no, noun, verb, other]	(Did the participant replace lexical items? If yes, please specify the class.)
MC.lexical.verb.morphology	[correct, wrong, missing]	(in the final attempt, for example correct verb/participle form, wrong verb/participle form, or pure stem/no inflection)
EC.lexical.verb.morphology	[correct, wrong, missing]	(in the final attempt, for example correct verb/participle form, wrong verb/participle form, or pure stem/no inflection)
MC.AUX.finiteness.morphology	[correct, wrong, missing]	(in final attempt)
EC.AUX.finiteness.morphology	[correct, wrong, missing]	(in final attempt)
comment	[...]	

the matrix clause, as shown in (11). The only four other cases in this category involve missing arguments. All of these stem from center embedded relative clauses, such as (10e). Maybe the participants have mistakenly taken the relative clause as argument or the complexity of this construction disturbed the sentence planning. The low number of these mistakes does not allow to draw any legitimate conclusion.

(11) Die Ärztin hat etwas gedacht, dass der Patient die Pillen geschluckt hat.
the doctor has something thought that the patient the pills swallowed has
'The doctor has (*something) thought, that the patient has swallowed the pills.' (A11, patient)

In sum the picture is as expected. The low-proficiency groups show higher error rates than the high-proficiency groups. The patterns are more pronounced for the JNU-low group, which is most likely due to the larger sample in this group. The low number of learners in the UVR-low group may be not representative for this "population".

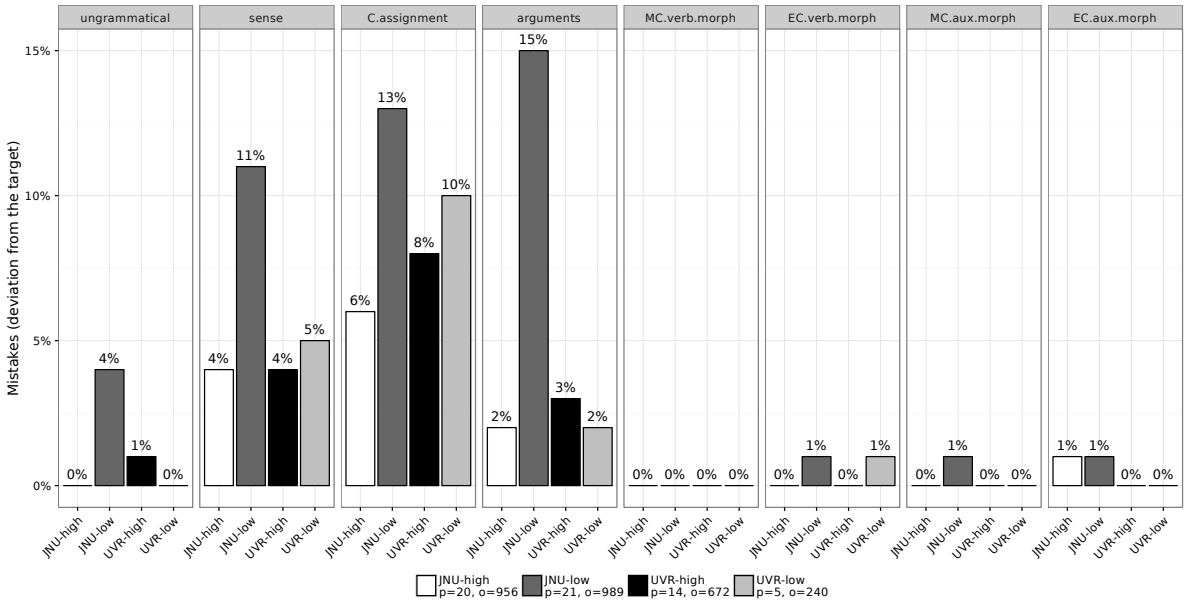


Figure 10.1: Mistakes in Experiment 6 (elicited production task) per participant groups. Legend shows number of participants (p) and number of observations (o) per group.

L1-differences

Matrix clauses In matrix clauses, participants produced almost exclusively V2-order (98.3%–100%). The error rates are extremely low. Therefore cases with deviant word order within the different subgroups (sentences types, clause order) are so small that they do not allow statistical evaluation, nor robust generalizations.

Cases with V-final order where very rare, only 10 occurrences in 2857 observations (0.35%). Some of the utterances are displayed in (12). Interesting cases are the utterances of one Indian

learner in (12d) and (12e) that initially chose the correct V2-order and then immediately self-corrects to V-final order. The two utterances by Italian learners in (12g) and (12h) show that these mistakes are not unique to OV-native speakers.

(12) V-final matrix clauses (n=10)

a. Die Ärzte den Opfern helfen können, wenn der Feuerwehrmann das Feuer gelöscht hat. (A08, aerzte)

b. Die Nachbarin eine Fest gefeiert hat, obwohl der Arbeiter geschlafen hat. (A08, nachbarin)

c. Der Autofahrer gebremst hat, weil ein Auto die Straße überquert hat. (B02, kind)

d. Das Auto fährt nicht + das Auto nicht mehr fährt, obwohl der Mechaniker den Motor repariert hat. (B07, mechaniker)

e. Die Touristin wart + die Touristin immer noch wartet, obwohl der Soldat das Tor schon geöffnet hat. (B07, soldat)

f. Der Doktor das Telefon ausgeschaltet hat, weil das klingeln die Leute gestört hat. (B13, klingeln)

g. Nachdem der Passagier den Koffer gefunden hat, der Pilot die Stewardess angerufen ist + hat. (D09, passagier)

h. Der Bruder die Suppe kochen kann, wenn die Schwester das Gemüse gekauft hat. (D11, schwester)

A second interesting pattern concerns the verb doubling cases. Here the learners pronounce two finite verbs in the matrix clauses, as shown in (13). Even though these cases are very rare, it is interesting that the learners pronounce the finite verb only in V2-position and in the V-final position, and not in a post-subject position, as shown in (13b) and (13c), in which the finite verb follows the fronted embedded clause and precedes the subject of the matrix clause. In three of the six doubling cases, the participants corrected this error, as shown in (13d).

(13) Matrix clauses with doubling of the finite verb (n=6)

a. Die Schauspielerin hat das Theater gewechselt hat, nachdem der Zuschauer die Karte verkauft hat. (B09, schauspielerin)

b. Wer die Oper komponiert hat, hat die Musikering geahnt + *pause* + hat. (D03, oper)

c. Nachdem die Kollegin einen Tee gekocht hat, hat der Kunde den Raum verlassen hat. (D12, kunde)

d. Obwohl der Arbeiter geschlafen hat, hat die Nachbarin ein Fest gefeiert hat + *ehm* + obwohl der Arbeiter geschlafen hat, hat die Nachbarin ein Fest gefeiert. (B05, nachbarin)

The remaining deviations contain mostly incomplete sentences in which the finite verb or larger parts of the sentence have not been recorded. Two special cases are shown in (14). In (14a) the learner produces an SVO-order in the matrix clause, i. e. the auxiliary follows the subject instead of preceding it. In (14b) it seems as if the learner only pronounces one

of two adjacent finite verbs. However, the learner also confused the contents of matrix and embedded clause rendering this structure completely nonsensical.

(14) Matrix clauses with *other* order (n=11)

a. Wer die Oper komponiert hat, die Musikerin hat etwas geahnt. (A03, oper)

b. Dass der Chef bezweifelt hat die Sekretärin den Brief geschrieben. (A07, sekretaerin)

No interesting patterns could be identified in the interim attempts besides the above mentioned wrong corrections and the self-correct cases of verb doubling. This is mainly due to the good performance of the participants. Hesitations and new attempts were very rare and did not reveal specific problems of clause order and word order.

Embedded clauses The plot in Figure 10.2 illustrates that the word order accuracy in embedded clauses was also very good. The error rates, however, are clearly higher than in the matrix clauses.

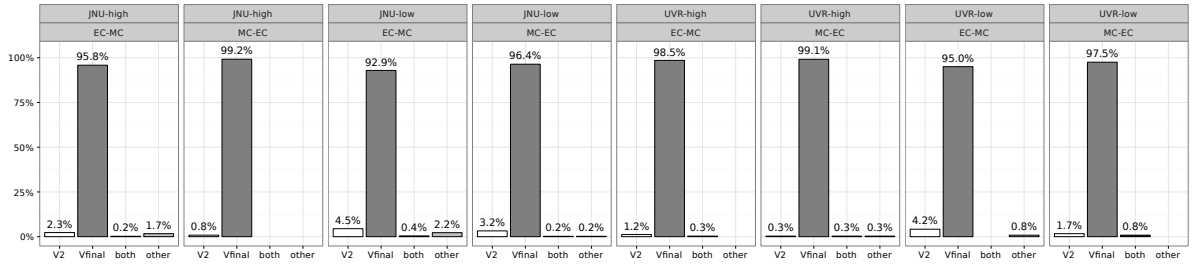


Figure 10.2: Verb position in the embedded clause in the final attempt in Experiment 6

Statistical analysis revealed main effects of clause order and participant groups indicating that participants produced more deviant word orders in embedded clauses which precede the matrix clauses than in embedded clauses which follow the matrix clause. Additionally, the low proficiency Indian learners produced more deviant word orders than the other groups. The exact model output is displayed in Table 10.5.

A closer look reveals that these mistakes are not equally distributed across sentence types and clause orders. The most prominent sentence type is the *wh*-interrogative, as shown in Figure 10.3. The visual inspection is supported by the results of a generalized linear model. The model revealed an interaction of clause type and clause order indicating a higher rate of deviant word order in those *wh*-interrogatives which precede their matrix clause ($p = 0.005$). This means we observe almost no mistakes if the interrogative follows the matrix clause. If it precedes the matrix clause, however, error rates go as high as 26.2%. The exact output of the model is given in Table 10.6. The high-proficiency learner groups show proportionally smaller error rates than the low-proficiency learner groups. This difference, however, could not be confirmed statistically, probably due to the low number of data points, which is most pronounced in the UVR-groups. Some of the responses to sentence-initial *wh*-interrogatives are given in (15). Without exception, the participants produced a V2 matrix clause, i. e. the

Table 10.5: Output of the GLME model for the elicited production task: correct vs. incorrect word order per participant groups and clause order in Experiment 6.
`glmer(word.order~clause.order+participant.group+(1|participant.ID)+(1|stimulus.ID),family=binomial)`

	Estimate	SE	z	p(>|z|)
Intercept (JNU-high, MC-EC)	−4.545	0.375	−12.114	0.000
clause.order (EC-MC)	0.600	0.231	2.598	0.009
JNU-low	0.853	0.366	2.327	0.020
UVR-high	−0.724	0.507	−1.428	0.153
UVR-low	0.315	0.598	0.527	0.598

subsequent matrix clause began with the finite verb. This indicates that the *wh*-interrogative clause was recognized as a constituent of the matrix clauses. The V2 in the *wh*-interrogative clauses can therefore not be identified as the result of uttering two independent matrix clauses after another. Especially interesting is the utterance in (15e). The participant first utters the clauses in the wrong order (matrix before embedded clause) with the superfluous argument *etwas* 'something'. In a second attempt the participant corrects the clause order and elides the superfluous argument. However, he chooses V2-order for the embedded *wh*-interrogative.

(15) Embedded *wh*-interrogatives with V2-order (n=30)
   a. Wer hat die Oper komponiert, hat die Musikerin etwas geahnt? (A11, oper)
   b. Wer hat die Diamanten gestohlen, hat der Polizist untersucht? (A16, diamanten)
   c. Wer hat das Turnier gewonnen, hat die Tänzerin erzählt? (B09, turnier)
   d. Wer hat eine Zigarette geraucht, hat die Krankenschwester gewusst? (C05, zigarette)
   e. Der Onkel hat etwas erfahren, wer den Kuchen gebacken hat + wer hat den Kuchen gebacken, hat der Onkel erfahren. (A14, essen)

Cases of verb doubling occurred in an equally low number as in matrix clauses. Some examples are given in (16). They illustrate that verb doubling occurs in various types of embedded clauses. Typically the first of the two finite auxiliaries appears after the subject, except for the one case in (16d) in which the first auxiliary appears between complementizer and subject.

(16) Embedded clauses with doubling of the finite verb (n=7)
   a. Obwohl die Nachbarin hat ein Fest gefeiert hat, hat der Arbeiter geschlafen. (A05, nachbarin)
   b. Wenn die Tante hat das Geld überwiesen hat, kann der Student die Miete bezahlen. (B02, tante)

Table 10.6: Output of the generalized linear model for the elicited production task: correct vs. incorrect word order per clause types and clause order in Experiment 6
`glmer(word.order~clause.order*clause.type,family=binomial)`

	Estimate	SE	z	p(>|z|)
Intercept (declarative, MC-EC)	−3.790	0.506	−7.495	0.000
clause.order (EC-MC)	0.029	0.715	0.040	0.968
causal	−0.316	0.771	−0.409	0.682
concessive	0.446	0.654	0.681	0.496
conditional	−1.398	1.123	−1.244	0.213
relative	0.705	0.570	1.236	0.217
temporal	0.963	0.601	1.601	0.109
wh-interrogative	−0.704	0.872	−0.807	0.419
yn-interrogative	−1.431	1.123	−1.274	0.203
clause.order (EC-MC):causal	−1.082	1.362	−0.794	0.427
clause.order (EC-MC):concessive	0.482	0.889	0.543	0.587
clause.order (EC-MC):conditional	0.687	1.422	0.483	0.629
clause.order (EC-MC):relative	−13.510	619.560	−0.022	0.983
clause.order (EC-MC):temporal	−1.273	0.978	−1.302	0.193
clause.order (EC-MC):wh-interrogative	2.856	1.029	2.776	0.005
clause.order (EC-MC):yn-interrogative	1.172	1.362	0.860	0.390

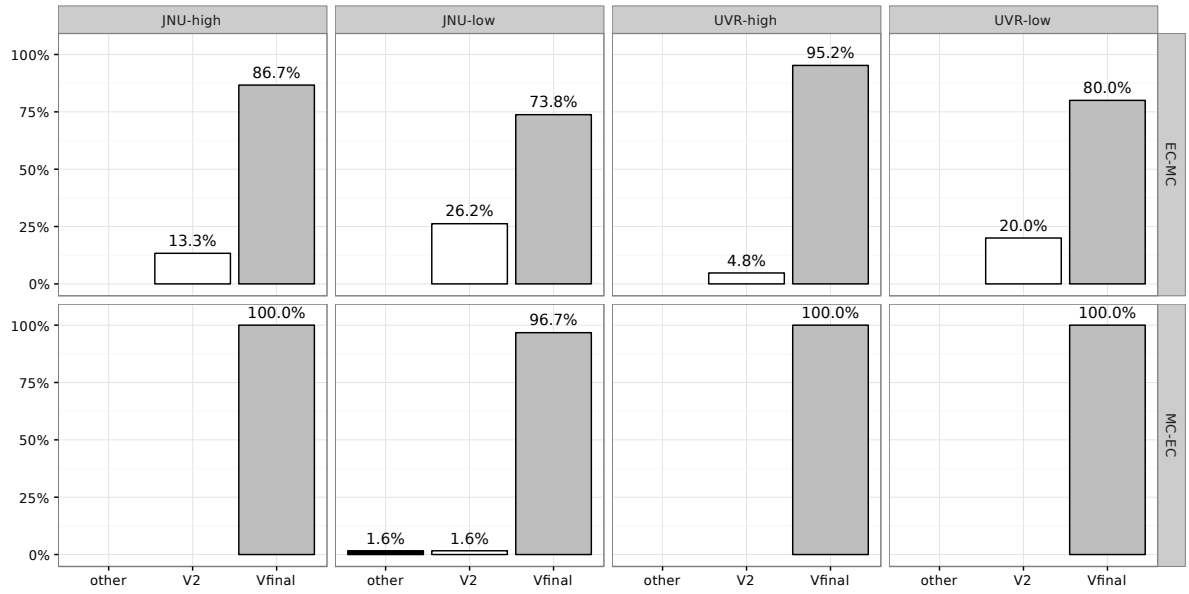


Figure 10.3: Verb position in the *wh*-interrogative clauses in the final attempt of producing the target sentence in Experiment 6

c. Der Chef hat bezweifelt, dass die Sekretärin hat den Brief geschrieben hat. (C04, sekretaerin)
d. Die Schauspielerin hat das Theater gewechselt, nachdem hat der Zuschauer die Karte gekau + *ehm* + verkauft hat. (D03, schauspielerin)

As for the matrix clauses, the inspection of word order in interim attempts did not reveal any interesting patterns.

10.2.4 Discussion

The participants produced very few errors in this task. As expected, error rates of the low-proficiency learners are higher than for the high-proficiency learner groups. Contrary to the predictions, the analysis did not reveal any correlation between erroneous word order patterns and the L1 of the participant groups. This allows two conclusions: Either there is no L1-transfer that is relevant for word order, or the task was not well-suited to diagnose such effects. I assume that the latter interpretation is more likely, especially in the light of the low error rates overall.

Only one condition elicited a high number of errors, namely sentence-initial embedded *wh*-questions. This clause type shows rates of V2-order in up to 26.2% of the cases. However, these errors are unlikely to be L1-transfer effects because this pattern shows up in both L1-groups. I suspect that the cause of this increased rate of erroneous V2-order is the following: Embedded *wh*-interrogatives are the only subordinate clause type that appears sentence-initially and that is not introduced by a subordinator (complementizer). The only other clause type in the experiment that is comparable in this respect is the relative clause that is introduced by a relative pronoun. However, in contrast to *wh*-interrogatives, relative clauses cannot appear sentence-initially but must follow their head noun. Therefore, I assume that it is the lack of an overt complementizer that leads to a higher number of V2-orders, especially with decreasing L2-proficiency. Moreover, this increased chance of verb movement is not the consequence of mistaking the initial clause as matrix clause. This possibility is excluded by the correct word order of the following matrix clause, as shown in (15). On the other hand, almost no V2-order has been produced when the *wh*-interrogative clause followed the matrix clause. Consequently, at least two factors seem to be necessary to entrap learners to produce a V2-order: lack of an overt complementizer and clause-initial embedded clause.

Occurrences of finite verb doubling were very low in number. These few occurrences, however, are equally distributed across the relevant factors such as participant groups, clause types, clause order and even across embedded vs. matrix clauses. Hence, I will consider these cases as non-systematic production errors.

Generally, the experiment design does not seem to be well-suited to investigate the syntactic skills of the participants in a fine grained manner. The participants even produced very few errors in sentences in which they switched matrix and embedded clauses. This indicates that producing a correct word order does not require understanding the propositional content. The fact that the stimulus clauses were visually present during the trials further facilitated the task and presumably precluded more errors. Overall, the task was similar to

textbook exercises for learners. Therefore, the good performance of the participants in this task may be attributed to their ability to apply their explicit grammatical knowledge rather than tapping into their interlanguage grammar/their internalized processing routines.

10.3 Experiment 7: Word order in embedded clauses (elicited imitation task)

10.3.1 Rationale

This experiment has a similar objective as Experiment 6 above. But in contrast to the previous experiment which focused on explicit knowledge of language, this experiment was designed as an elicited imitation task that measures implicit knowledge of language (Erlam 2006). The elicited imitation method has been used in first language acquisition since the nineteen-sixties (Fraser et al. 1963) and has been adapted to second language acquisition (Flynn 1986), see Bley-Vroman & Chaudron (1994) for a critical discussion of this experimental paradigm. In this task, participants are asked to listen to recorded sentences and repeat them. Usually the participants are instructed to repeat the sentences verbatim (cf. Erlam 2006 for deviating instructions). It is important that the number of segments of the target sentence (e. g. words) exceed the short-term memory capacity (about seven units, Miller 1955), to avoid that participants only serially recall the list of segments (Bley-Vroman & Chaudron 1994). If the capacity is exceeded, participants have to resort to a representation of a higher order, and chunk the input into larger units, such as phrasal, or clausal/propositional units. After the comprehension process, participants have to transform this representation back into a proper utterance. This part of the task is *reconstructive*, since the exact morpho-syntactic structure has to be reconstructed on the basis of the representation. In this way the task involves two instances in which the participants have to make use of their interlanguage grammar – comprehension and reconstruction.

The experimental manipulation in this task targeted the word order of the embedded clause. The recordings that were presented to the participants either exhibited a grammatical V-final order or an ungrammatical V2-order. The predictions for this experiment are structured as follows: Accurate repetition of the input only indicates that the participants followed the instructions. Only deviations from the recorded input are revealing. Those deviations fall into two major groups. Deviations from grammatical sentences (*corruptions*) indicate which phrase structure configuration is active in the learners interlanguage grammar. Under the functional transfer hypothesis, SVO-type errors are predicted only for Italian learners. Under the functional development hypothesis, SVO-type errors are predicted for low-proficiency learners, irrespective of their L1. Deviations from ungrammatical input sentences are different. They can be instances of *corrections*, i. e. participants' response to an ungrammatical[3] embedded V2-clause with a grammatical V-final clause. Such an automated

[3]The term *ungrammatical* is certainly an idealization here. Some embedded clauses are acceptable with V2-order in German. The licensing conditions for embedded V2-clauses is, however, still controversially debated (see e. g. Heycock 2006 and references cited therein). A meaningful discussion of this matter is beyond the scope of this thesis and not primarily relevant for the interpretation of the experimental results.

correction indicates that V-final structure is part of the interlanguage grammar/processing routines. Corrections will be assessed through the ratio between corrections and sole repetitions. Under a strict L1-transfer hypothesis, higher correction rates are predicted for Indian learners. Besides I expect that correction rates increase with proficiency, i. e. higher correction rates for high proficiency learners.

10.3.2 Method

Participants

The participants are described in detail in Section 10.1.1.

Procedure

The recording of the target sentences took place in a sound proof booth in the *PhonLab* of the University of Konstanz. The material was spoken by a female speaker with (almost) no regional dialect. Intonation was kept as neutral as possible. Every target sentence was recorded in two conditions that are explained in detail below. The experiment started with textual instructions followed by three practice trials to acquaint the participants with the task. For every trial, the participant saw a fixation cross in the center of the screen. Pressing the space bar started the playback of the recording. The participants could repeat the playback as often as they wanted by pressing the space bar. They were instructed to utter the sentence when they had understood it. After repeating they pressed the enter button to proceed to the next trial. We opted for the possibility of the repeated playback because, especially for the low proficiency group, the sentences were very difficult to understand.

The procedure was programmed in the python experiment suite *PsychoPy* (Peirce 2007, 2009) and run on a laptop (OS Linux Ubuntu). The responses of the participants were recorded with a *Olympus LS-5* PCM recorder. Every participant saw 48 experimental items interspersed with 6 fillers, resulting in 54 stimuli in total that were randomized by the experiment software. The experiment took 31 minutes on average but the duration varied considerably between the participants (18–61 min.).

Materials

The experimental stimuli were very similar to the material of the elicited production task presented in Section 10.2.[4] The materials consisted of 48 base sentences that belong to one of eight different types of embedded clauses with six lexicalizations each, as in (17)–(24). Two conditions were created for each stimulus that differed only in the word order of the embedded clause: a grammatical version with verb-final order (V-FINAL) and an ungrammatical variant in which the finite verb appeared in a potential V2-position (V2). For this *fictional* V2-order, I constructed regular V2-clauses that followed the subordinations. Two clause types are extraordinary in this respect, namely *wh*-interrogatives and relative clauses. The

[4] In fact, the grammatical condition in this experiment is identical to the target utterance of the elicited production task above.

elements introducing theses clauses are not subordinations but argumental pronouns, see (19) and (24). Hence, in the V2-condition, the finite verb follows these elements. All relative clauses are object relative clause which results in object-initial clauses in the V2-condition. In all other clause types the fronted finite verb followed the subject argument. As already mentioned above, the distinction between grammatical and ungrammatical embedded clauses in the material is idealized (see Freywald 2014 for V2-clauses with overt complementizers in German).

(17) **Declarative clause**

a. V-FINAL
Die Eltern haben geglaubt, dass der Junge die Schokolade bezahlt *hat*.
the parents have believed that the boy the chocolate paid has
'The parents believed that the boy paid for the chocolate.'

b. V2
*Die Eltern haben geglaubt, dass der Junge *hat* die Schokolade bezahlt.
the parents have believed that the boy has the chocolate paid

(18) **Polar interrogative clause**

a. V-FINAL
Der Vater hat nicht gewusst, ob der Nachbar den Hund getötet *hat*.
the father has not know whether the neighbor the dog killed has
'The father didn't know whether the neighbor killed the dog.'

b. V2
*Der Vater hat nicht gewusst, ob der Nachbar *hat* den Hund getötet.
the father has not know whether the neighbor has the dog killed

(19) ***Wh*-interrogative clause**

a. V-FINAL
Der Polizist hat untersucht, wer die Diamanten gestohlen *hat*.
the policeman has investigated who the diamonds stolen has
'The policeman investigated who stole the diamonds.'

b. V2
*Der Polizist hat untersucht, wer *hat* die Diamanten gestohlen.
the policeman has investigated who has the diamonds stolen

(20) **Temporal adverbial clause**

a. V-FINAL
Die Kollegin hat einen Tee gekocht, nachdem der Kunde den Raum verlassen
the colleague has a tea boiled after the customer the room left
hat.
has
'The colleague has prepared (a) tea after the customer had left the room.'

b. V2
*Die Kollegin hat einen Tee gekocht, nachdem der Kunde *hat* den Raum
the colleague has a tea boiled after the customer has the room
verlassen.
left

(21) **Causal adverbial clause**

a. V-FINAL
Die Mutter hat gelacht, weil der Sohn einen Witz erzählt *hat*.
the mother has laughed because the son a joke told has
'The mother laughed because the son had told a joke.'

b. V2[5]
(*)Die Mutter hat gelacht, weil der Sohn *hat* einen Witz erzählt.
the mother has laughed because the son has a joke told

(22) **Concessive adverbial clause**

a. V-FINAL
Das Auto fährt nicht mehr, obwohl der Mechaniker den Motor repariert
the car drives not anymore although the mechanic the engine repaired
hat.
has
'The car doesn't run anymore although the mechanic did repair the engine.'

b. V2[6]
*Das Auto fährt nicht mehr, obwohl der Mechaniker *hat* den Motor repariert.
the car drives not anymore although the mechanic has the engine repaired

The conditional clauses have all been recorded/presented in the serialization in which the *if-clause* (antecedent) precedes the consequent clause. According to my impression, this is actually the unmarked order in German. Additionally, this resulted in a condition that differed from the other conditions in two parameters: It is the first clause that must be corrected and the matrix clause is non-subject-initial.

(23) **Conditional clause**

a. V-FINAL
Wenn die Tante das Geld überwiesen *hat*, kann der Student die Miete bezahlen.
if the aunt the money transferred has can the student the rent pay
'If the aunt has transferred the money the student can pay the rent.'

b. V2
*Wenn die Tante *hat* das Geld überwiesen, kann der Student die Miete bezahlen.
if the aunt has the money transferred can the student the rent pay

[5]V2-clauses introduced by *weil* are frequently used and fully acceptable in German. However they are not identical in meaning to the V-final variant (Scheffler 2013, Antomo & Steinbach 2010).
[6]With an appropriate intonation *obwohl* can connect two main clauses. This is irrelevant here.

The relative clauses are all centrally embedded, with the non-finite verb of the matrix clause following it. This structure enabled us to avoid extraposition of relative clauses. German exhibits a restricted class of relative clauses with V2-order (Gärtner 2001). Crucially, one of the felicity conditions of these V2-clauses id that they have to appear in sentence-final position. The center embedding therefore excludes this variant.

(24) **Relative clause**

a. V-FINAL
Der Junge hat das Fahrrad, das der Großvater repariert *hat*, verloren.
The boy has the bike that the grandpa repaired has lost
'The boy lost the bike that the grandpa has repaired.'

b. V2
*Der Junge hat das Fahrrad, das *hat* der Großvater repariert, verloren.
The boy has the bike that the grandpa repaired has lost

The filler clauses involve paratactic structures conjoined by the connectors *aber* 'but' and *und* 'and', as displayed in (25a) and (25b). Crucially, these filler sentences resemble the word order of the ungrammatical V2-condition in the experimental items in so far as the finite verb directly follows the subject in both clausal conjuncts.

(25) a. Peter möchte Mathematik studieren aber sein Vater will das nicht.
Peter likes study math but his father wants that not
'Peter would like to study math but his father doesn't want that.'

b. Der Verkäufer singt ein Lied und der Kunde kauft eine Flasche Wasser.
the salesclerk sings a song and the customer buys a bottle water
'The salesclerk sings a song and the customer buys a bottle of water.'

Data analysis

Pre-processing of the recorded responses was almost identical as for the elicited production task described in Section 10.2.2. One exception was that the annotation scheme differed slightly, as illustrated in Table 10.7.

In the same way, the remarks about the statistical analysis in Section 10.2.2 are valid for this experiment. Prior to the analyses, all empty cells were removed (approximately 6% of the data). These resulted from skipped items (especially those of one participant who aborted the experiment) and incomplete answers that could not be classified properly.

Table 10.7: Annotation scheme for Experiment 7 (elicited imitation task)

ID	possible values	comments
attempts	[1, ..., n]	(attempts: starting an utterance with repeating a clause-initial phrase, usually subject DP or conjunction + subject DP. As an example, if you have *... dem Bruder gesagt, dass der Vater den ...+... dass der Vater den Jungen gesehen hat* = new attempt. *... dass der Vater den ...+... den Jungen gesehen hat* = **not** a new attempt. In cases where it is hard to decide, for a new attempt at least two lexical phrases have to be repeated.)
incomplete	[no, yes]	(in final attempt; if it is more missing than just the final auxiliary, e. g. the lexical verb or also arguments. Is it maybe just the matrix clause.)
missing.arguments	[no, yes]	(in final attempt; Is e. g. the object missing?)
MC.finite.verb.position	[V2, Vfinal, both, other]	(count correct position, V-final, if it comes in an early attempt in a automated fashion; otherwise use the final attempt)
MC.lexical.verb.lexical.occurrence	[correct, wrong, missing]	(in final attempt)
MC.AUX.lexical.occurrence	[correct, wrong, missing]	(in final attempt)
EC.finite.verb.position	[Vfinal, V2, both, other]	(count correct position, V-final, if it comes in an early attempt in a automated fashion; otherwise use the final attempt)
EC.lexical.verb.lexical.occurrence	[correct, wrong, missing]	(in final attempt)
EC.AUX.lexical.occurrence	[correct, wrong, missing]	(in final attempt)
finite.verb.doubling.MC	[no, yes, different.lex]	(at least once in the utterance even if not in the final attempt, since this might indicates unconscious processes)
finite.verb.doubling.EC	[no, yes, different.lex]	(at least once in the utterance even if not in the final attempt, since this might indicates unconscious processes)
MC.lexical.verb.morphology	[correct, wrong, missing]	(in the final attempt, for example correct verb/participle form, wrong verb/participle form, or pure stem/no inflection)
EC.lexical.verb.morphology	[correct, wrong, missing]	(in the final attempt, for example correct verb/participle form, wrong verb/participle form, or pure stem/no inflection)
MC.AUX.finiteness.morphology	[correct, wrong, missing]	(in final attempt)
EC.AUX.finiteness.morphology	[correct, wrong, missing]	(in final attempt)
comment	[...]	

10.3.3 Results

The results are reported for two main groups: the control measures and the target sentences that exhibited the experimental manipulation.

Control measures: Matrix clauses, mistakes, and fillers

Deviant word orders in the matrix clauses are very rare (<1%). No effect could be identified for the word order of the input or clause types. Verb position of interim responses did not reveal any pattern either.

Rates of general mistakes are shown in Figure 10.4. The graph seems to indicate that the Italian learners made more mistakes than the Indian learners. However, these numbers have to be interpreted with care because the participants could playback the input as often as they wanted. Therefore, participants may have different strategies: answering earlier with less playbacks and a higher risks of producing errors, or opting for more playbacks to repeat the input more accurately.

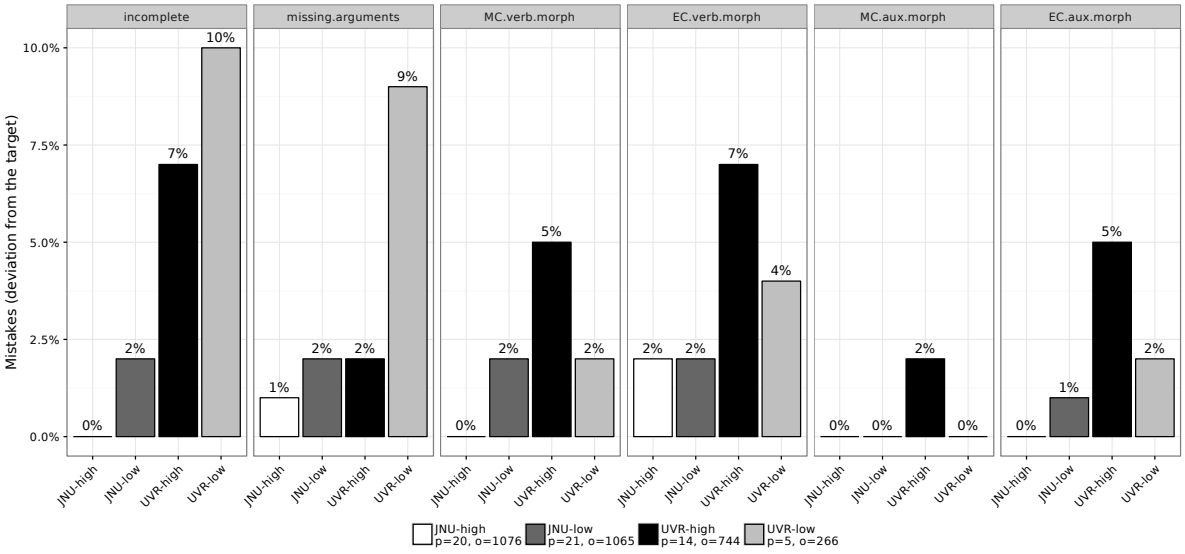


Figure 10.4: Mistakes in Experiment 7 (elicited imitation task). The four panels on the right show percentages of non-target like inflection morphology on the lexical verbs and auxiliaries in matrix and embedded clauses, respectively. Legend shows number of participants (p) and number of observations (o) per group.

The fillers consisted of two matrix clauses conjoined by either *und* 'and' or *aber* 'but'. The first clause was generally repeated with V2-order except for a few exceptions in the JNU-low group. However, the second sentence elicited more deviations, as displayed in Figure 10.5. But as indicated by the number of occurrences (ranging from 28–118), the absolute number of clauses with deviant verb position in these coordinated structures is rather small.

Only nine utterances show a V-final structure in the second clause. Three of them cannot be regarded as syntactic violations because participants replaced the coordinative *aber* 'but' with the subordinating *obwohl* 'although' which requires V-final word order, as shown in (26).

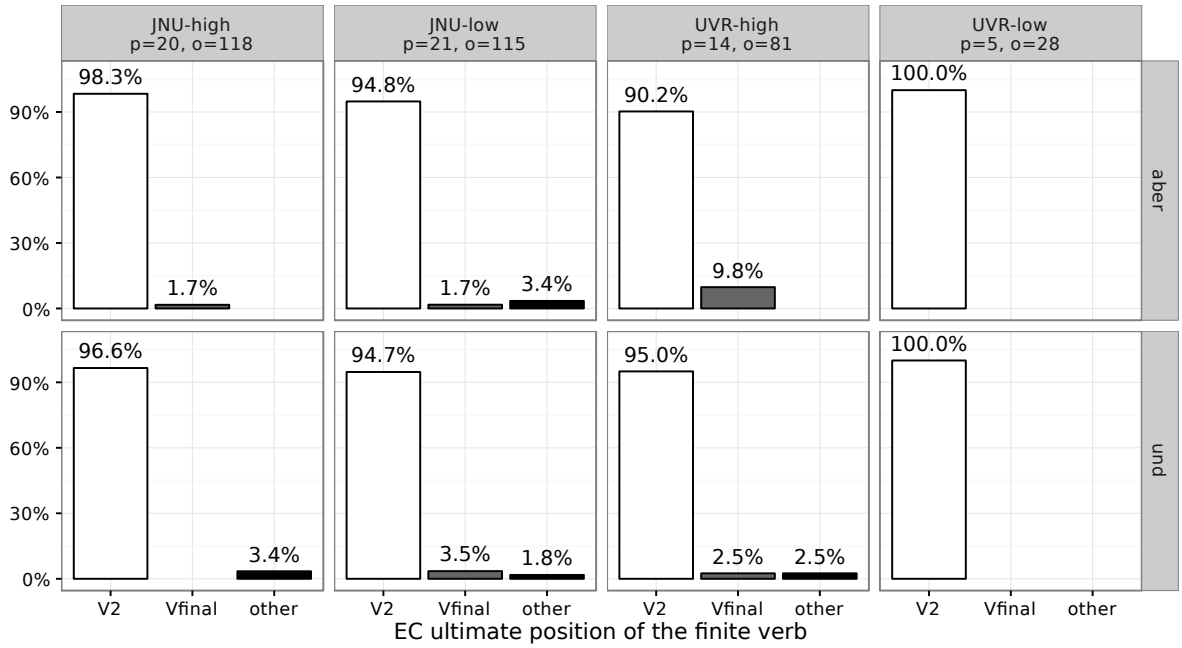


Figure 10.5: Position of the finite verb in the second clause of the filler sentences in Experiment 7. Panel headings show number of participants (p) and number of observations (o) per group.

(26) a. Peter möchte eine Mathematik studieren, obwohl sein Vater nicht will. (A02, filler6)
Peter wants a math study although his father not want

b. Der Vermieterin war im Bahnhof gefahren, obwohl der Zug weg war. (D09, filler4)
the landlord was in the station driven although the train gone was

c. Peter will Mathematik studieren, obwohl seine Vater nicht will. (D09, filler6)
Peter wants math study although his father not want

The remaining six utterances, displayed in (27) and (28), exemplify the ungrammatical V-final word order in coordinated matrix clauses. Except for (27c) the V-final structure is unambiguously marked by a finite auxiliary in the clause-final position. The lexical variation and mistakes are reflections of the experimental method. It shows that participants repeated the content of the sentences with their own linguistic means.

(27) Input:
Die Fußballmanschaft ist Weltmeister geworden und die Leute haben auf der
the soccer team is world champion become and the people on the street
Straße getanzt.
danced
'The soccer team became world champion and the people danced on the street.'
a. Die Fußballmannschaft hat die Weltmannschaft gewonnen und die Leute auf den Straße getanzt hat. (A02, filler3)
b. Die Fußballmannschaft hat die Weltmeister geworden und die Leute auf der Straße getanzt hat. (A03, filler3)
c. Die Fußballmannschaft ist Weltmeister geworden und die Leute auf die Straße tanzen. (D11, filler3)

(28) a. Die Vermieterin ist zum Bahnhof gefahren, aber der Zug schon weg ist. (B18, filler4)
b. Der Kaiser hat Geburtstag, aber sein bester Freund im Urlaub ist. (D06, filler5)
c. Der Kaiser hat ihre Geburtstag aber sein Freund im Urlaub ist. (D09, filler5)

The remaining fillers that reannotated with the verb position *other* are mostly cases in which the finite verb is missing and only the participle appears in V-final position, as in (29).

(29) Die Fußballmanschaft ist Weltmeister geworden und die Leute auf der Straße getanzt. (B06, filler3)

Target: Embedded clauses

The embedded clauses are the target regions in this experiment. Figure 10.6 gives an overview of the responses per participant group and input condition. In response to the grammatical V-FINAL input, participants produced very few deviations. The UVR-low group even shows an accuracy of 100%. The inspection of the interim utterances, i. e. the non-final attempts, however, revealed that the UVR-low group also produced V2-orders in 1.9% of the cases. For the other three participant groups the V2-order in non-final attempts is generally smaller than in the final counts. Therefore, the rates of erroneous V2 embedded clauses in response to V-FINAL input is equally low in all participant groups but the UVR-low group corrects these deviations more often than the other groups. In the V2-condition, however, participants deviated in a large number of cases from the word order of the input file. Both input conditions will be discussed separately below.

V-final input

As noted above, the overall rate of deviations from the V-final word order of the input is very low (below 3%). The distribution across sentence types, however, shows at least two noteworthy accumulations. The results for the V-FINAL condition are displayed in Figure 10.7. The UVR-high group shows a V2-deviation in 10% of the causal clauses. However, these deviations actually only amount to four occurrences, as the one in (30a). The other accumulation

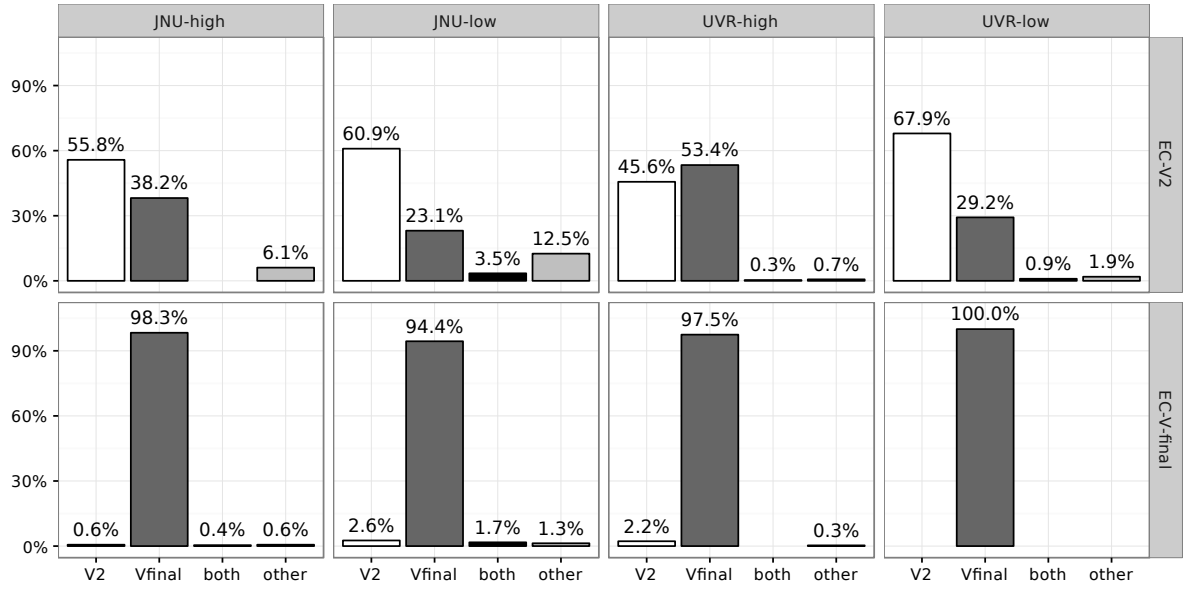


Figure 10.6: Elicited imitation task: Ultimate verb position in the embedded clause per participant group and input condition. V2-input in the top row and V-final input in the bottom row.

can be found for embedded polar interrogatives within the JNU-low group. The devations are either V2-responses, as in (30b), or cases of verb doubling, as in (30c), in which the finite verb is uttered in the V2-position and in the V-final position.

(30) a. Die Mutter hat gelacht, weil der Sohn hat einen Witz erzählt. (D14, sohn)
b. Der Lehrer hat nicht verstanden, ob der Schüler hat die Prüfung bestanden. (A14, schueler)
c. Der Lehrer hat nicht verstanden, ob der Schüler hat die Prüfung bestanden hat. (A18, schueler)

In sum, the V-FINAL condition does not provide any interesting patterns.

V2-input

The responses to the V2-input are the most interesting ones because the input is actually ungrammatical in German. It is this condition in which we expect participants to repair the ungrammatical structures. This *repair* is measured by the *correction rate*, i. e. a V-final response to a V2-input. The correction rate for the participant groups and the different clause types is displayed in Figure 10.8.

The generalized linear mixed-effects model revealed significantly higher correction rates for the high-proficiency groups ($p = 0.007$) and only a tendency for higher correction rates for the Italian learners ($p = 0.08$). These differences are indicated by the dashed lines in Figure 10.8. The model output is given in Table 10.8.

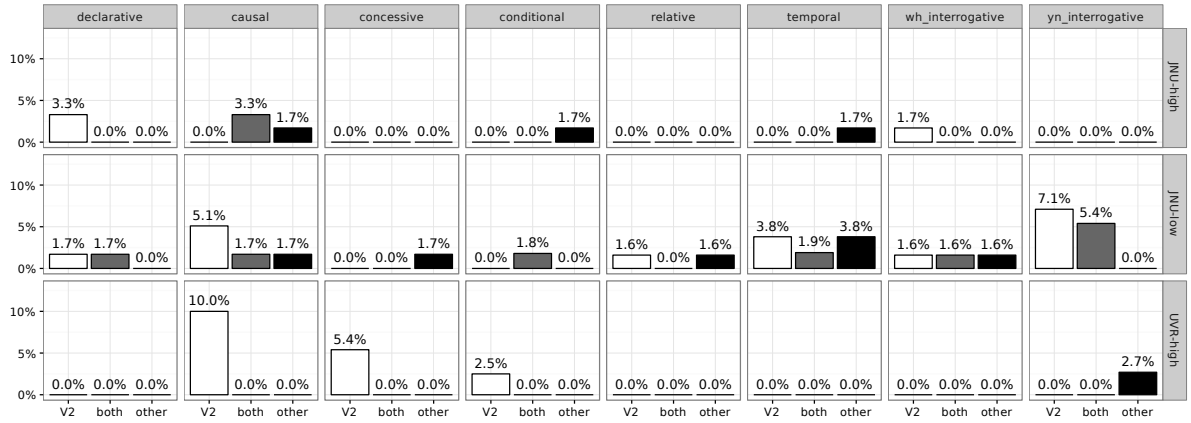


Figure 10.7: Elicited imitation task: Deviating verb position in the embedded clauses in response to the V-FINAL condition per clause type.

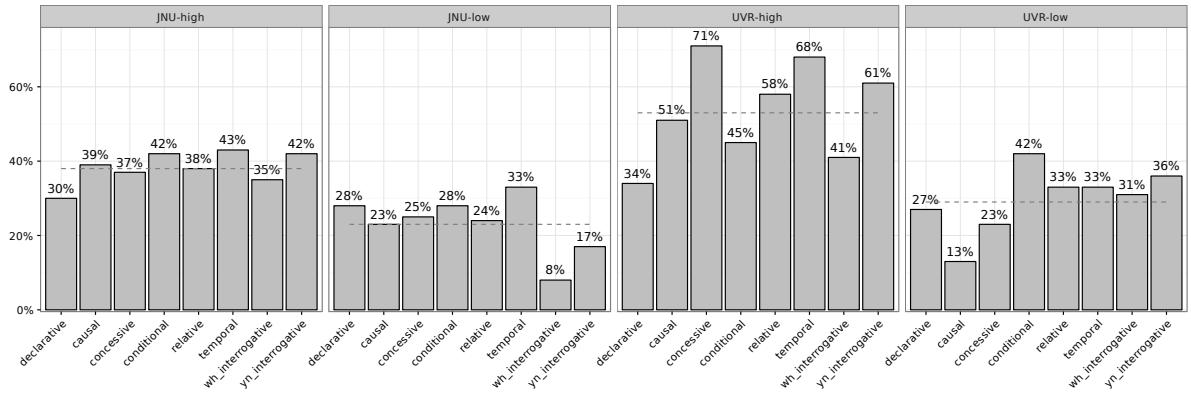


Figure 10.8: Elicited imitation task: Rate of correcting V2-input to V-final clauses. Dashed lines indicate the means per participant group.

Table 10.8: Output of the GLME model for the elicited imitation task: correction rate per participant groups.
`glmer(correction.rate~L1.group+proficiency.group+(1|stimulus.ID)+(1|participant.ID),family=binomial)`

	Estimate	SE	z	p(>|z|)
Intercept (JNU, low)	−1.856	0.367	−5.050	0.000
L1 group (UVR)	0.836	0.477	1.753	0.080
proficiency group (high)	1.223	0.452	2.705	0.007

Subsequently, the statistical analysis was also applied to the subsets of the individual participant groups in order to determine the correction rate between the different clause types[7]. The model revealed no significant effect within the JNU-high group and the UVR-low group. Within the JNU-low group, the *wh*-interrogatives show a significantly lower correction rate than the other clause types ($p = 0.010$). Within the UVR-high group, three sentence types showed significantly higher correction rates: concessive clauses ($p = 0.005$), temporal clauses ($p = 0.013$) and polar-interrogative clauses ($p = 0.046$). The outputs of the models are displayed in Table 10.9.

Figure 10.6 above shows that a considerable amount of responses is classified as *other* with respect to the verb position. From 91 occurrences in this category, the majority of 80 responses is lacking the finite verb (auxiliary) of the embedded clause. In the remaining eleven cases, the finite verb is placed either before the subject, as in (31), or directly before the non-finite verb, as in (32).

(31) a. Der Auto fährt nicht mehr, obwohl hat der Mechaniker das repariert. (A14, mechaniker)
b. Der Pilot hat das Stewardess angerufen, nachdem hat der Passagier seinen Koffer + Koffer gefunden. (A17, passagier)
c. Die Touristin wartet immer noch, obwohl hat der Soldat das Tor geöffnet. (B14, soldat)

(32) a. Die Polizist + der Polizist hat untersucht, wer die Diamanten hat gestohlen. (B04, diamanten)
b. Die Detektive hat + haben untersucht, ob der Mörder den Aufzug benutzt hat + hat benutzt. (C01, moerder)
c. Der Junge hat das Fahrrad, das der Großvater hat repariert, verloren. (D02, großvater)

The responses with missing auxiliaries[8], as in (33), seem to be unequally distributed across the participant groups. Consequently, I evaluated them statistically. For the analysis, the data was transformed into a binary variable indicating whether the auxiliary of the embedded clause was missing or not. This *missing auxiliary rate* is displayed in Figure 10.9. The statistical analysis[9] revealed simple effects of all three factors: L1 group, proficiency group and input condition. Indian learners omit the auxiliary more often than Italian learners. In fact, numbers for missing auxiliaries within the Italian groups are so low ($n = 3$) that they cannot be considered substantial. Within the Indian cohort, low proficiency learners produce more responses with missing auxiliaries than high proficiency learners. Both Indian proficiency groups, however, show a substantial number of auxiliary omission only in response to a V2-input. The output of the statistical model is shown in Table 10.10.

[7] Comparisons were carried out with *dass*-clauses (declarative) as reference point.

[8] Some of the utterances could principally be complete grammatical structures because for some verbs in German the word form of the past participle is identical to the 2SG.PRS, such as *repariert* '(has) repaired/repairs' or *benutzt* '(has) used/uses'. I ignored this fact in the analysis below because in most cases the change in tense least to nonsensical utterances.

[9] The statistical analysis had to be carried out by a simple generalized linear model because models with random effect structures did not converge.

Table 10.9: Output of the GLME model for the elicited imitation task: correction rate per clause types.
`glmer(correction.rate~clause.type+(1|stimulus.ID)+(1|participant.ID),family=binomial)`

	JNU-high				JNU-low				UVR-high				UVR-low			
	Est.	SE	z	p(>|z|)	Est.	SE	z	p(>|z|)	Est.	SE	z	p(>|z|)	Est.	SE	z	p(>|z|)
Intercept (declarative)	−1.3	0.6	−2.1	0.032	−1.3	0.5	−2.4	0.015	−0.8	0.7	−1.1	0.268	−1.3	0.8	−1.6	0.114
causal	0.7	0.6	1.1	0.257	−0.4	0.6	−0.6	0.570	1.0	0.8	1.3	0.191	−1.0	1.0	−1.0	0.333
concessive	0.5	0.6	0.9	0.391	−0.2	0.6	−0.4	0.694	2.4	0.8	2.8	0.005	−0.2	1.0	−0.2	0.865
conditional	0.8	0.6	1.3	0.181	−0.4	0.7	−0.6	0.576	0.6	0.8	0.7	0.473	0.8	0.9	0.9	0.379
relative	0.6	0.6	1.0	0.337	−0.3	0.6	−0.5	0.649	1.4	0.8	1.7	0.083	0.6	0.9	0.6	0.545
temporal	1.0	0.6	1.7	0.094	0.2	0.6	0.4	0.699	2.0	0.8	2.5	0.013	0.4	0.9	0.4	0.687
wh-interrogative	0.4	0.6	0.7	0.506	−1.9	0.8	−2.6	0.010	0.3	0.8	0.3	0.744	0.3	0.9	0.3	0.732
polar-interrogative	0.8	0.6	1.4	0.155	−0.9	0.7	−1.4	0.163	1.6	0.8	2.0	0.046	0.6	0.9	0.6	0.534

(33) Der Vater hat nicht gewusst, ob der Nachbar der + den Hund getötet. (A16, nachbar)

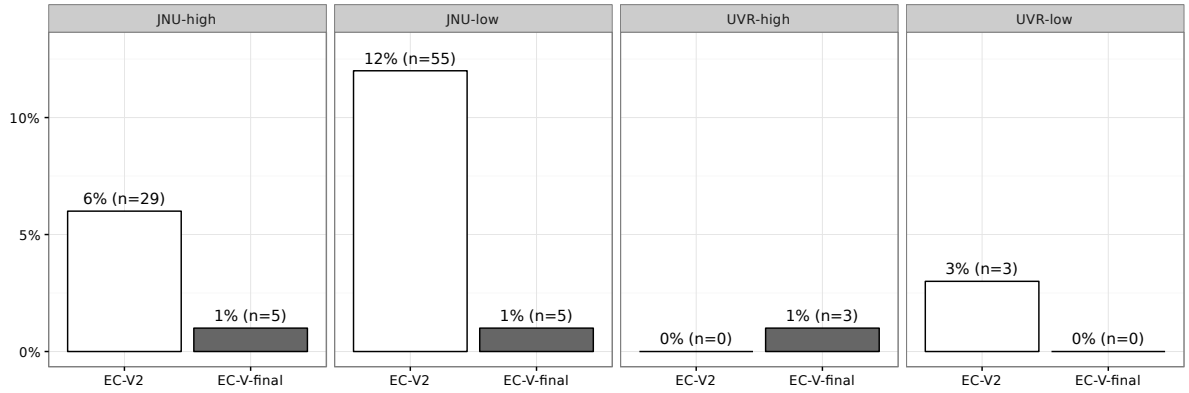


Figure 10.9: Elicited imitation task: Rate of missing finite verb (auxiliary) per participant group and input condition. Absolute number of occurrences in brackets.

Table 10.10: Output of the generalized linear model for the elicited imitation task: missing auxiliary rate per participant groups. `glm(missing.aux.rate~L1.group*proficiency.group*input.condition, family=binomial)`

	Estimate	SE	z	p(>|z|)
Intercept (JNU low V2)	−2.02	0.14	−13.97	<0.0001
L1 group (UVR)	−1.51	0.60	−2.51	0.0121
proficiency group (high)	−0.79	0.25	−3.22	0.0013
input condition (V-final)	−2.31	0.44	−5.31	<0.0001
L1 group:proficiency group	−1.36	1.19	−1.14	0.2528
L1 group:input condition	−12.72	633.54	−0.02	0.9840
proficiency group:input condition	0.36	0.69	0.51	0.6083
L1 group:proficiency group:input condition	15.31	633.54	0.02	0.9807

Verb doubling

A particular kind of verb position is the doubled pronunciation of the finite verb, as illustrated in (34). Figure 10.10 summarizes all occurrences of verb doubling, either in the interim or in the ultimate response. The overall frequency is very low and a substantial amount of verb doubling cases are only produced by the JNU-low group. This was confirmed by the statistical analysis for embedded clauses ($p = 0.001$) and with a simplified model also for the matrix clause ($p = 0.034$). Model outputs are given in Table 10.11 and Table 10.12. In the matrix

clauses, 3 of 10 cases occurred in response to the V2-condition, and 22 of the 33 occurrences in the subordinate clauses. In sum, only the JNU-low group produces verb doubling cases and much more often in embedded clauses than in matrix clauses.

(34) a. Die Tante hat geklopft, weil der Onkel hat die Tür verlassen hat. (A03, onkel)
b. Der Junge hat das Fahrrad, das hat der ver… + Großmutter repariert hat, verloren. (A10, grossvater)
c. Der Bauer hat seinen Sohn angeschauen + der Bauer hat seinen Sohn angeschrien, nachdem der Pferd hat die Pflanzen gefressen … hat. (A14, pferd)
d. Wenn die Schwester hat die Gemüse gekocht hat, kann der Bruder die Suppe gekocht hat. (A09, schwester)
e. Die Mutter hat den Fernseher ausgeschalten hat, nachdem die Tochter die Hausaufgaben gemacht hat. (A02, Tochter)
f. Wenn der Assistent das Handout kopiert hat, kann der Chef Besprechung fortsetzen kann. (B08, assistent)

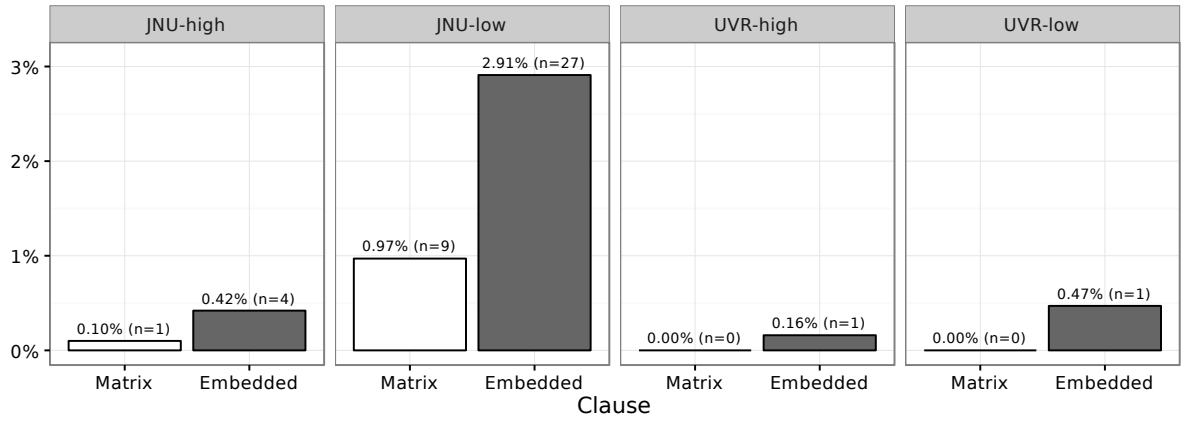


Figure 10.10: Elicited imitation task: Verb doubling in matrix and embedded clauses. Absolute number of occurrences in brackets.

10.3.4 Discussion

First, we can state that the experimental design worked as intended: Participants really performed a reconstructive task. This is indicated by the following observations: In the filler structures, the participants replaced the contrastive lexical connector *aber* 'but' with the contrastive subordination *obwohl* 'although', see (26). While these elements are semantically very similar, they are formally very different in that *aber* introduces a matrix clause with V2-order whereas *obwohl* introduces a subordinate clause with V-final order.[10] Hence participants preserved the meaning but changed the lexical and syntactic form.

[10] Josef Bayer (p. c.) pointed out correctly that *obwohl* does also occur with V2-clauses. However, these constructions need special intonation marking and do not have a comparable meaning to V-final *obwohl* or *aber*.

Table 10.11: Output of the GLME model for the elicited imitation task: verb doubling in embedded clauses
`glmer(verb.doubling~L1.group*proficiency.group+(1|stimulus.ID) +(1|participant.ID), family=binomial)`

	Estimate	SE	z	p(>|z|)
Intercept (JNU, high)	−6.323	0.700	−9.037	0.000
L1 group (UVR)	−0.923	1.179	−0.783	0.433
proficiency group (low)	2.038	0.642	3.176	0.001
L1 group:proficiency group	−0.919	1.641	−0.560	0.576

Table 10.12: Output of the generalized linear model for the elicited imitation task: verb doubling in matrix clauses.
`glm(verb.doubling~L1.group*proficiency.group, family=binomial)`

	Estimate	SE	z	p(>|z|)
Intercept (JNU, high)	−6.859	1.001	−6.855	0.000
L1 group (UVR)	−15.708	1948.214	−0.008	0.994
proficiency group (low)	2.234	1.055	2.117	0.034
L1 group:proficiency group	−2.234	3840.893	−0.001	1.000

A second illustration that participants performed a reconstructive task is given in example (35) – a sentence-initial conditional/temporal clause with the finite verb in V-final position. The response of the participant is given in (35b), again the plus symbol (+) marks boundaries of a new attempt. At the beginning, the initial clause is mistaken as a main clause and therefore realized with V2-order although this order was not triggered by the input material (35a). This mistake happens again in the second attempt. Only in the third attempt, the initial clause is recognized as a subordinate clause which is indicated by the overt realization of the complementizer *wenn* "if, when". Interestingly, as soon as the clause was recognized as a subordinate clause, it was realized with the finite verb in clause-final position. The erroneous forms of the determiner, i. e. the constant gender mismatch of feminine *die Feuer* instead of neuter *das Feuer* 'the fire', indicates that the participant performs a reconstructive task instead of strictly repeating verbatim in the last attempt.

(35) a. input sentence (therefore also target sentence)
Wenn der Feuerwehrmann das Feuer gelöscht hat, können die Ärzte den
when the fire fighter the fire extinguished has can the doctors the
Opfern helfen.
victims help.
"When/If the fire fighters have extinguished the fire than the doctors could help the victims."

b. participants response (B04, aerzte)
der Feuerwehrmann hat die Feuer gelöscht nee? + der Feuerwehrmann hat
the fire fighter has the fire extinguished no? + the fire fighter has
die Feuer gelöscht + Wenn der Feuerwehrmann die Feuer gelöscht hat
the fire extinguished + when the fire fighter the fire extinguished has
können die Ärzte die Opfer helfen
can the doctors the victim help

Third, the corrections of the ungrammatical V2-input into grammatical V-final embedded clauses are indications of a reconstructive performance of the participants and at the same time the primary results of the experiment.

Closer inspection of the **correction rates** per clause type revealed a parallel to the elicited production task above. Remember that in the elicited production task, the *wh*-interrogatives triggered higher V2-rates, although only in sentence-initial position. The JNU-low group showed a very low correction rate for exactly this sentence type. I tentatively assume that it is the lack of an overt complementizer that lowers the impulse of producing a V-final order. Speculating further, this could indicate that the learners have already internalized a negative correlation between overt subordinations and V2-movement. The contrast to the JNU-high group indicates that, with increasing proficiency, learners extend this grammatical rule to embedded clauses with covert subordinators such as *wh*-interrogative. Hence the difference is no longer present in the JNU-high group, see Figure 10.8. The UVR-high group can be considered to be more proficient in general. Hence, it is not surprising that they do not show a penalty for the complementizerless *wh*-interrogatives parallel to the high proficient Indian learners. In contrast to the high proficient Indian learners, however, the UVR-high

group shows significant peaks for three clause types: concessive clauses, temporal clauses and polar interrogatives. It remains unclear as to what could trigger the high correction rate for these three types. On the one hand, theses sentence types seem quite resistant to a V2-variant in comparison to, for instance, causal clauses introduced by *weil* 'because' which exhibit a V2-alternative (see e. g. Freywald 2010: 58–61, Scheffler 2013: 50–52: among many others). On the other hand, *wenn*-clauses 'when' should pattern either with temporal *nachdem*-clauses 'after' in their temporal reading, or with polar interrogatives in their conditional reading[11]. Because these clauses do not cause higher correction rates in any of the other groups, JNU-high or UVR-low, they cannot be regarded as proficiency- or L1-specific. I will leave the interpretation of these peaks to future research. The UVR-low group did not show any significant effect for the clause types. However, we must keep in mind that the participant group only counted five participants. The lack of effects can therefore hardly be seen as reliable.

The **missing auxiliary rate** actually shows the distribution and direction that was hypothesized for the word order corrections. It seems that the Indian learner have been more disturbed by embedded clauses with a V2-order which lead to the omission of the finite auxiliary. I assume that Indian learners have more problems with embedded V2-clauses because they do neither correspond to the target grammar, nor to the L1 grammar. Hence problems arise already at the encoding of the input. These encoding problems lead to the omission of the finite verb, as a strategy to resolve the conflict of processing an element with conflicting features, internal properties (meaning and form) and external properties (syntactic position). No such conflict arises in the V-final input condition: V-final clauses are compatible with the target and the L1 grammar. Hence no encoding problems arise and the missing auxiliary rate is non-significantly low. Consequently, the Italian learner have no problem in encoding embedded V2-clauses in the input. Even though they do conform to the target grammar, they partly conform to the L1 grammar because the finite verb (T) follows the subject, as in SVO languages with a head-initial TP. This explains why the Italian learners show an almost no missing auxiliaries irrespective of the input condition.

Whereas the experiment yielded the expected *correction effect*, i. e. participants responded to the ungrammatical V2 input with grammatical V-final clauses, there was no significant *anti-correction effect*. The prediction that especially Italian low proficiency learners would produce V2- or rather SVO-structures in embedded clauses also in response to V-FINAL input was not borne out.

The results indicated that **verb doubling** is characteristic of low-proficiency learners with a V-final L1. Considering that this phenomenon is more prominent in embedded clauses, I assume that it result from overgenerating V2-movement of the finite auxiliary from a clause-final position. In this movement dependency both copies are pronounced. The observations in this experiment match in all relevant parameters with corresponding cases in the L1-acquisition of German and Swiss German (Schönenberger 2001: 137–140): very rare occurrence, appear mostly in embedded clauses but in a small proportion also in matrix clauses, affect only non-thematic verbs (auxiliaries and modal verbs).

[11] Polar interrogatives share the semantic similarity that they operate on a binary-alternative and show formal similarities such as (optional) V1 order in V2-languages such as German.

Despite the fact that the UVR-low group was very small and therefore not representative, some aspects of the experiment are subject to critique. The complex sentences made the task very demanding and maybe even too demanding for most of the low-proficiency participants. The experimental sentences were very long, with usually four different discourse referents, two per verb in the matrix and embedded clause respectively. In order to receive enough useful responses, participants were allowed to play back the input sentences as often as they wanted. As a consequence, several participants could only solve the task by listening to the recording and repeating parts of the target more or less simultaneously. This behavior presumably led to a reduction of the reconstructive nature of the responses and covered significant aspects of the interlanguage grammar. Maybe one could facilitate the task by presenting the nominal arguments on the screen and restrict the number of repetitions.[12]

10.4 Experiment 8: Parsing of basic word order in matrix clauses (sentence matching task)

10.4.1 Rationale

The two previous experiments involved the explicit knowledge of the participants' interlanguage grammar insofar as the participants had to perform a linguistic task, such as uttering a sentence. The two following experiments are designed to tap into the unconscious grammatical knowledge and the corresponding processing routines of the learners. The sentence matching task, which is explained below, allows us to investigate the processing abilities of L2-comprehension in a parametric fashion. In Section 9.3, I reviewed the accounts of several authors who modeled L2-acquisition path of V2 through adding of phrase structure projections and readjusting the headedness parameter of existing projections. For German sentence structure, three projections and their respective headedness are of importance: VP, TP, and CP. Each of these projections has two potential head-directions: head-initial or head-final. The C-projection has a third option, basically a null option, i. e. no movement to C at all. This results in $2 \times 2 \times 3 = 12$ mathematically possible configurations. The possible permutations of the sentence in (36) are illustrated in Table 10.13. Effectively, we have to consider only a smaller number of surface orders because at least one position is not filled by a surface element but corresponds to the origin of the V2-moved element. Note that V2- and SVO-order can only be distinguished in non-subject-initial clauses. Only the highlighted possibilities are unique surface orderings. All options with a head-final CP are string-identical to configuration with a head-final TP.[13] Additionally V-to-C movement into a head-final CP would not result in V2-order.

[12] Interestingly though, only five participants noted that the word order in some of the sentences was not correct. All these participants were from the JNU groups (Indian L1s). Of course I cannot estimate how many of them recognized the ungrammatical word order but remained silent about it. However, I met one participant of the UVR-high group one year after the experiment when I was presenting some preliminary results at the university of Verona. The participant was very surprised to hear that there have been clauses with ungrammatical word order in the experiment. This may indicates that such deviations are more likely to be overlooked, if they conform to the L1 grammar.

[13] Obviously, we would receive even more homomorphic surface structures if we would consider sentences with only one finite verb because then the surface distinction between V and T position would vanish.

Three elements that function as fix points are necessary to diagnose unequivocally which configuration is present. The first is an object which forms a unit with the verbal head and allows to distinguish between OV and VO. The headedness of T can be identified by the positioning of the T-head with respect to this VP-complex: T-VP or VP-T. V2-order is identified by the occurrence of the finite verb between the subject and the prefield element *gestern* 'yesterday'.

(36) Gestern hat er ihn gesehen.
yesterday has he him seen
'Yesterday he saw him.'

Table 10.13: Possible permutation according to headedness parameters of VP, TP, and CP. Subscripts indicate the heads of the projections (V, T, and C) as well as subject (S) and object (O).

	V-initial (VO)	**V-final (OV)**
	without T-to-C movement	
T-initial	Gestern er_S hat_T $gesehen_V$ ihn_O	Gestern er_S hat_T ihn_O $gesehen_V$
T-final	Gestern er_S $gesehen_V$ ihn_O hat_T	Gestern er_S ihn_O $gesehen_V$ hat_T
	with T-to-C movement (T-initial)	
C-initial	Gestern hat_C er_S $\emptyset_T$ $gesehen_V$ ihn_O	Gestern hat_C er_S $\emptyset_T$ ihn_O $gesehen_V$
C-final	Gestern er_S $\emptyset_T$ $gesehen_V$ ihn_O hat_C	Gestern er_S $\emptyset_T$ ihn_O $gesehen_V$ hat_C
	with T-to-C movement (T-final)	
C-initial	Gestern hat_C er_S $gesehen_V$ ihn_O $\emptyset_T$	Gestern hat_C er_S ihn_O $gesehen_V$ $\emptyset_T$
C-final	Gestern er_S $gesehen_V$ ihn_O $\emptyset_T$ hat_C	Gestern er_S ihn_O $gesehen_V$ $\emptyset_T$ hat_C

From previous sentence matching tasks with L2-learners of German we know the following: High proficiency learners show sensitivity to the V2/SVO alternation (Eubank 1993b) and are more sensitive for certain grammatical violations (Pienemann 1998). Furthermore and native speakers show sensitivity to structural violations only in complex sentences (Eubank 1993b, Clahsen et al. 1995). Whereas those studies only tested clauses with one verbal element, the current studies involve analytical verb forms with a finite auxiliary which allows a more detailed investigation of the phrase structural markup of the interlanguage grammar.

The overarching hypothesis yields the following predictions for this experiment: Under the functional transfer hypothesis, it is predicted that both learner groups show sensitivity for their L1-configuration, i. e. shorter reaction times for an OV and T-final configuration for Indian learners, and shorter reaction times for a VO and T-initial configuration for Italian learners. If there is also a proficiency specific contrast, this effect should be more prominent in the low proficiency groups. Under the functional development hypothesis both L1-groups should show shorter reaction times in the T-initial (SVO-like) configuration. This configuration may be more prominent in the low-proficiency groups, too.

10.4.2 Method

Participants

In addition to the four learner groups described in Section 10.1.1, a reference group of 19 adult German native speakers, all students of the University of Konstanz participated in this study. One person was excluded from the analysis because the experimenter witnessed a foreign accent. Subsequently the data of 18 participants (age 20–33 years, mean 26 years; 3 male, 1 left handed) entered the analysis. Participants received a reimbursement of 3 € for participation.

Procedure

The experiment was carried out as a sentence matching task (Freedman & Forster 1985)[14]. This procedure has been successfully applied in investigations of L2-acquisition by Eubank (1993b) and Clahsen & Hong (1995). The primary task for the participants is to judge whether two presented stimulus sentences are identical or not. All experimental items contain two identical strings. Most importantly, the strings vary in their grammaticality. The rationale is the following: The participants are faster to compare and judge grammatical strings because these can be chunked into meaningful units. Ungrammatical strings, on the other hand, behave more like lists and have to be compare element per element. The decision latencies therefore indicate whether the string receives a proper phrase structure analysis.

After a written instruction, participants received nine practice items to get acquainted with the task. A schema of the sentence matching task paradigm is given in Figure 10.11. Prior to each stimulus, the participants saw a fixation cross in the center of the screen. They could start the presentation by pressing any button on the keyboard. Two properties of the presentation should preclude that the participants compare the two strings only visually without parsing it: First, the two sentences were not vertically aligned but the lower sentence was indented. Second, the two stimuli sentences were presented serially on the screen. For a certain interval Int_1, only the first sentences was visible on the screen. For interval Int_2, both stimuli sentences were visible on the screen. For interval Int_3, none of the sentences were visible on the screen but the participants were still allowed to give their judgment. After interval Int_3, a timeout screen appeared. Obviously, the length of the intervals is crucial to impose a time pressure on the participants. The presentation intervals for the L2-learners were readjusted by the factor 1.5 (following Clahsen & Hong 1995). The exact values of the intervals for native speakers and L2-learners are given in Table 10.14. Measurement of the response latencies started with the appearance of the second stimulus sentence. After each judgment, participants were presented a feedback about the correctness of the response to stimulate motivation.

Every participant saw 36 experimental stimuli interspersed with 44 filler stimuli (20 from Experiment 9 below), resulting in 80 stimuli in total. The material was presented in standard orthography. The experimental items of this experiment (n=36), the experimental items of the other experiment (n=20), and four additional filler involved matching sentence pairs (60

[14]For an elaborate discussion of same-different matching tasks see Forster (1979).

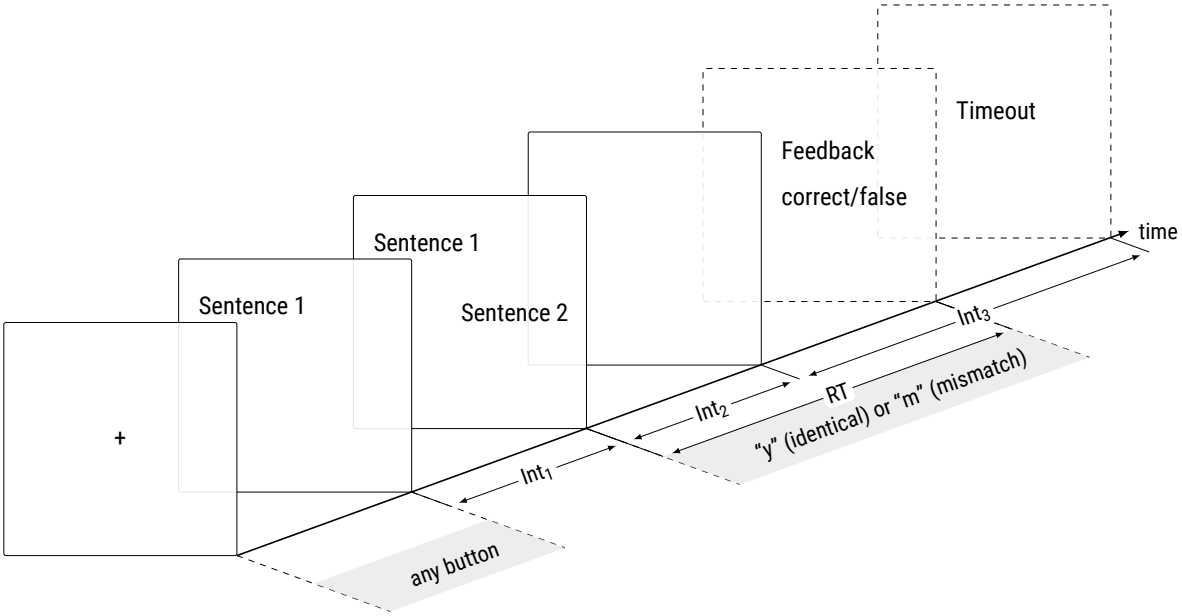


Figure 10.11: Scheme of the sentence matching task

	Int_1	Int_2	Int_3
L1	2.0	2.0	3.0
L2	3.0	3.0	4.5

Table 10.14: Presentation intervals (in seconds) of the sentence matching procedure for native speakers and L2-learners

in total). Together with 20 filler stimuli that involved non-matching pairs, the overall ratio of matching and non-matching pairs resulted in 3:1, as in Clahsen & Hong (1995: 37, also fn. 10). I opted for this ratio, instead of a 1:1 ratio, to hold the overall experiment time comparably short in order to avoid fatigue effects. The procedure was programmed in the python experiment suite *PsychoPy* (Peirce 2007, 2009) and run on a laptop (OS Linux Ubuntu).

Materials

The experimental stimuli consisted of 36 simple declarative main clauses, as in (37). The initial position was always filled by an adverbial, here *gestern* 'yesterday'. The other constituents were a definite subject DP, an object DP/PP and a complex verb form that consisted of a non-finite thematic verb and a finite auxiliary. The order of the constituents varied in 6 experimental conditions according to a 2×3 design. The first factor (V-Position) varied the order of the non-finite verb and the object, thereby creating head-final (OV) or head-initial VP structures (VO) respectively. The second factor (T-Position) varied the position of the finite auxiliary, either in second position after the adverbial but before the subject (V2), after the subject (T-initial), or in clause-final position (T-final). As indicated, only the configuration in (37a) is grammatical in German. The auxiliary was *haben* 'have' in 29 lexicalizations and *sein* 'be' in the remaining 7 items.

(37) a. OV–V2
Gestern hat der Vater ein Haus gekauft.
yesterday has the father a house bought
'Yesterday the father bought a house.'

b. OV–T-initial
*Gestern der Vater hat ein Haus gekauft.

c. OV–T-final
*Gestern der Vater ein Haus gekauft hat.

d. VO–V2
*Gestern hat der Vater gekauft ein Haus.

e. VO–T-initial
*Gestern der Vater hat gekauft ein Haus.

f. VO–T-final
*Gestern der Vater gekauft ein Haus hat.

The 20 fillers that stem from a different experiment are described below in Section 10.5.2. The remaining fillers fall into two categories: plausible mismatch sentences (n=18), and word salad (n=6). The plausible mismatch sentences consisted of a pair of grammatical sentences that differed in one word, as in (38). The word salad fillers (4 matching and 2 mismatching) are just strings of words that not even form proper phrases, as illustrated in (39). All stimuli are given in the appendix.

(38) a. Der Schüler rennt nicht zu einem *anderen* Bahnhof.
the student runs not to a different station
'The student doesn't run to a different station.'

b. Der Schüler rennt nicht zu einem *kleinen* Bahnhof.
the student runs not to a small station
'The student doesn't run to a small station.'

(39) Lieben alle neuen von Universität Apfel Haus.
love all new from university apple house

Data analysis

Data analysis was carried out using the statistical software package *R* (R Core Team 2015). Prior to analysis, all empty cells were excluded, i. e. trials in which participants did not press any button before the timeout (0.4% of the data, 0.2% of this experiment's items). Subsequently error rates and reaction times for correct decisions have been evaluated using (generalized) linear mixed-effects model of the *lme4* package (Bates et al. 2013). Following the arguments in Barr et al. (2013) and Bates et al. (2015), I fitted mixed-effects models with the simplest justifiable random-effect structure. Subsequently, model criticisms were performed, as recommended in (Baayen & Milin 2010) by excluding absolute standardized residuals exceeding 2.5 standard deviations. I report the results of the criticized model and take effects as significant if the respective t-value exceeds an absolute value of 2. Groupwise comparisons have been carried out using pairwise t-test with Holm-correction for multiple testing (Holm 1979).

10.4.3 Results

The results are presented as comparisons between and within the participant groups. The response accuracy was very high. The overall values of correct responses within each condition ranges from 86%–100%. If we exclude the UVR-low group which comprises only five participants, the values rise to 94%–100%. Comparisons of the accuracy rates both between groups, and within groups per condition did not reveal significant differences.

The summary of the reaction times is displayed in Figure 10.12. Groupwise comparisons using pairwise t-test with Holm-correction confirmed that the reaction times of the native speakers are significantly shorter than for all learner groups (all $p < 0.00001$). This difference is also detectable for the fillers. Additionally, the group mean of the UVR-high group was significantly lower than the mean of other three learner groups (all $p < 0.001$). No differences between the means of the three remaining groups could be detected.

Within the native speaker group no differences between the conditions could be detected. Although the graphs for both proficiency levels of the Indian learners look very similar, the mixed effects models detected a significant interaction for the experimental factors T-Position and V-Position with shorter reaction times for the grammatical OV–V2 condition in the JNU-high group ($t = 2.041$). In the UVR-high group the model revealed an interaction of both factors with shorter reaction times for V2-order than T-initial in the VO condition. However, this effect decreased to non-significance after model criticism, indicating that it was driven by outliers. Within the UVR-low group, the model revealed an interaction of both factors with shorter reaction times for VO in contrast to OV order in the T-initial condition. The exact model outputs are given in Tables 10.15 to 10.17

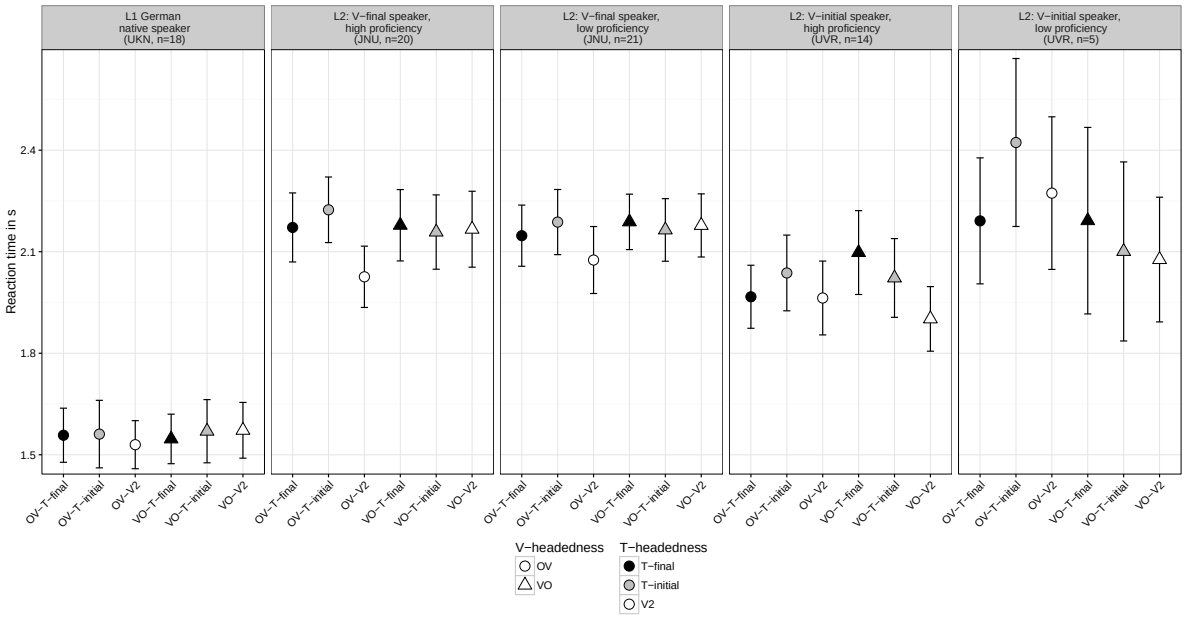


Figure 10.12: Mean reaction times for verb position in matrix clauses in Experiment 8 (95 % CIs)

Table 10.15: Output of the LME model for the JNU-high group in Experiment 8: Reaction time per experimental conditions.
`lmer(RT~V.headedness*T.headedness+(1+V.headedness+T.headedness|participant.ID)+(0+V.headedness|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (OV:T-final)	2.157	0.123	17.602	2.170	0.123	17.684
V.headedness (VO)	−0.007	0.066	−0.108	−0.002	0.071	−0.022
T.headedness (T-initial)	0.034	0.073	0.466	0.048	0.075	0.635
T.headedness (V2)	−0.138	0.068	−2.041	−0.152	0.072	−2.118
VO:T-initial	−0.071	0.093	−0.766	−0.076	0.099	−0.767
VO:V2	0.111	0.093	1.188	0.156	0.099	1.579

Table 10.16: Output of the LME model for the UVR-high group in Experiment 8: Reaction time per experimental conditions.
`lmer(RT~V.headedness*T.headedness+(1+V.headedness*T.headedness|participant.ID)+(1+T.headedness+V.headedness|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (VO:T-final)	2.025	0.141	14.409	2.083	0.130	16.016
V.headedness (OV)	−0.083	0.092	−0.900	−0.125	0.099	−1.258
T.headedness (T-initial)	−0.064	0.087	−0.736	−0.066	0.085	−0.779
T.headedness (V2)	−0.130	0.086	−1.513	−0.188	0.088	−2.146
OV:T-initial	0.142	0.123	1.149	0.144	0.114	1.267
OV:V2	0.125	0.125	0.995	0.186	0.127	1.471

Table 10.17: Output of the LME model for the UVR-low group in Experiment 8: Reaction time per experimental conditions.
`lmer(RT~V.headedness*T.headedness+(1+V.headedness+T.headedness|participant.ID)+(0+V.headedness|stimulus.ID)`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (OV:T-initial)	2.349	0.203	11.584	2.414	0.219	11.034
V.headedness (VO)	−0.340	0.160	−2.130	−0.350	0.164	−2.131
T.headedness (T-final)	−0.158	0.180	−0.878	−0.224	0.190	−1.184
T.headedness (V2)	−0.137	0.167	−0.819	−0.152	0.161	−0.941
VO:T-final	0.347	0.202	1.721	0.353	0.213	1.660
VO:V2	0.214	0.199	1.075	0.174	0.210	0.826

10.4.4 Discussion

The observation that the accuracy levels are indifferently high provides a convenient baseline for the comparison of the reaction times. Furthermore, the comparable accuracy rates indicate that all participant groups were capable of conducting the task.

The between-group reaction time differences show that native speakers are faster in comparing grammatically licit as well as grammatically illicit strings. This indicates that the advantage of native speakers is rooted in processing routines that are below the clausal level, probably the phrasal level and also at the level of lexical access. Generally, this advantage is not unexpected in a model in which processing is dependent on the development of routines. Native speakers have the advantage that they enhanced the language specific routines for many more years than the learners. Interesting but not obviously clear is the difference between the advanced Italian speakers (UVR-high) and the other learner groups. On the one hand, the contrast to the low proficiency Italian learners (UVR-low) is expected, because the respective processing routines develop over time/with practice. The contrast to the high proficiency Indian learners (JNU-high), on the other hand, is unexpected. A closer look at the acquisition biography (see Table 10.3), however, reveals that almost all participants from the UVR-high group had German lessons already in school (5.2 years on average) whereas the learners from the JNU-high group had almost no German lessons in school (0.4 years on average). Even though both high proficiency groups show a comparable duration of German lessons in the university, the reaction time differences must be attributed to the difference in duration of acquisition.

The primary target of interest, however, are the reaction time differences between the experimental conditions within the participant groups. For the comparison of main clauses with varying word order we did not find any differences within the native speaker group. This matches the results of Eubank (1993b) and Clahsen et al. (1995) in which native speakers of German and English do not show differences for short matrix clauses with ungrammatical word order. I assume that native speakers are able to repair these structures in almost no time.

The results of the learner groups however show interesting contrasts. The high proficiency Indian learners (JNU-high) show a very specific advantage for only the grammatical order namely the OV–V2 order. This indicates that the processing routines of these learners have been successfully adjusted to the position of the finite verb in German main clauses, while they may recycle/transfer the OV-routine from their native language.

The Italian learners on the hand show different patterns which are related to the parametric difference of their native language. The low proficiency group (UVR-low) does not show an overall preference for the native language pattern (VO–T-INITIAL) but exactly this configuration is involved in the strongest contrast. I have to be cautious here because the analysis did not reveal a main effect of V-POSITION, but contrasts seems to indicate the following: Switching from the L1-parameters VO–T-INITIAL to a different T-POSITION does not result in a significant difference whereas switching the V-POSITION parameter does. This implies that the processing of the VO-order is still preferred for the UVR-low group. The results of the high proficiency Italian learners can only be seen as a tendency because the significance disappeared after model criticism. Nevertheless, it is nevertheless worth a remark: The ad-

vanced Italian learners (UVR-high) showed a contrast of V2 order and T-FINAL order within the VO order. The details for the Italian learners are still somewhat unclear. One reason is that the data points are comparably few. With more data the patterns would be more suitable for comparisons.

One generalization can be formulated: The Indian learners do not show any sensitivity to VO order which is neither part of their native language nor of the target language German. For the Italian learners, on the other hand, the VO parameter is involved in the significant contrasts. Taken together, this indicates that a transfer of processing routines from L1 into the parsing of L2 do take place. The headedness of the VP, i. e. the order of object and verb, seems to be fundamental. The effect is not so strong that it is appropriate to claim that Italian learners only use VO-parsing routines. It seems more appropriate that these learners show interference from their L1-parameters in this experiment, i. e. partial match with L1-parameters leads to a slow-down in reaction times.

10.5 Experiment 9: Parsing of basic word order in subordinate clauses (sentence matching task)

10.5.1 Rationale

This experiment is very similar to Experiment 8. It also investigates the underlying parsing routines in L2-comprehension. In contrast to Experiment 8, this experiment targets the processing of embedded clauses. I suspect language users may have different *parsing modes* for matrix and embedded clauses, especially in the context of a V-final (and T-final) V2-language such as German. To keep number of conditions small, V2-patterns are not included in the materials for embedded clauses. The possible permutations of the two projections (VP and TP) are therefore restricted to $2 \times 2 = 4$ possible permutation, which are spelled out in the following section.

The overarching hypothesis yields basically identical predictions as for the previous experiment: Under the functional transfer hypothesis, it is predicted that both learner groups show sensitivity to their L1-configuration, i. e. shorter reaction times for an OV and T-final configuration for Indian learners, and shorter reaction times for a VO and T-initial configuration for Italian learners. If there is also a proficiency specific contrast, this effect should be more prominent in the low proficiency groups. Under the functional development hypothesis both L1-groups should show shorter reaction times in the T-initial (SVO-like) configuration. This configuration may be more prominent in the low-proficiency groups, too.

10.5.2 Method

Participants and procedure are identical to Experiment 8 in Section 10.4. Both experiments have been combined in one experimental run.

Materials

The experimental stimuli consisted of 20 complex sentences which are composed of a declarative matrix clause and a declarative embedded clause, as illustrated in (40). The matrix clause always consisted of a subject DP followed by a clause embedding verb. The embedded clause always started with the declarative complementizer *dass* 'that', followed by a subject DP (here *der Vater* 'the father'). Subsequently, three other constituents completed the embedded clause: an object DP/PP, a non-finite thematic verb, and a finite auxiliary. The order of these three constituents varied in 4 experimental conditions according to a 2×2 design. The first factor (V-Position) varied the order of the non-finite verb and the object, thereby creating head-final (OV) and head-initial VP structures (VO), respectively. The second factor (T-Position) varied the position of the finite auxiliary. It appeared either directly after the subject (T-initial), or in clause-final position (T-final). As indicated, only the combination in (40a) is grammatical in German. The auxiliary was *haben* 'have' in 16 lexicalizations and *sein* 'be' in the remaining 4 cases.

(40) a. OV–T-final
Der Nachbar weiß, dass der Vater ein Auto repariert hat.
the neighbor knows that the father a car repaired has
'The neighbor knows that the father has repaired a car.'

b. OV–T-initial
*Der Nachbar weiß, dass der Vater hat ein Auto repariert.

c. VO–T-final
*Der Nachbar weiß, dass der Vater repariert ein Auto hat.

d. VO–T-initial
*Der Nachbar weiß, dass der Vater hat repariert ein Auto.

Detailed information about the fillers, the 36 experimental items of Experiment 8, as well as the 24 independent fillers are given in Section 10.4.2. All stimuli are given in the appendix.

10.5.3 Data analysis

The analysis procedure is identical to the one described in Section 10.4.2.

10.5.4 Results

The results are presented as comparisons between and within the participant groups. The accuracy within each condition was more stretched in comparison to Experiment 8 and ranged between 86%–100%, even without the small UVR-low group. The lowest value stems from the native speaker in response to the OV-T-initial condition. But even this condition amounts only to 12 false responses. Consequently statistical analysis did not reveal any significant differences for the accuracy rate as a function of the experimental conditions.

The reaction times are displayed in Figure 10.13. The groupwise comparison using pairwise t-test with Holm-correction revealed a similar pattern as in Experiment 8. The reaction times of the native speakers were significantly shorter than for all learner groups (all $p < 0.0001$).

Additionally, the group mean of the UVR-high group was significantly lower than the mean of all other learner groups (all $p \leq 0.001$).

Within the native speaker group, the model detected a tendency with shorter reaction times for the OV-condition ($t = 1.896$). This tendency, however, disappeared after model criticism which indicates that it was only driven by outliers. For the high proficiency learner groups (JNU-high and UVR-high), no effects could be detected. Within the JNU-low group, the model detected a main effect of V-Position indicating that reaction times were shorter for the grammatical OV-condition than for the ungrammatical VO-condition ($t = 2.536$). This effect is more prominent in the T-final condition. Within the UVR-low group, the model revealed an interaction with significantly shorter reaction times for T-final-order within the VO-condition ($t = 2.433$). The exact model outputs are given in Tables 10.18 to 10.20.

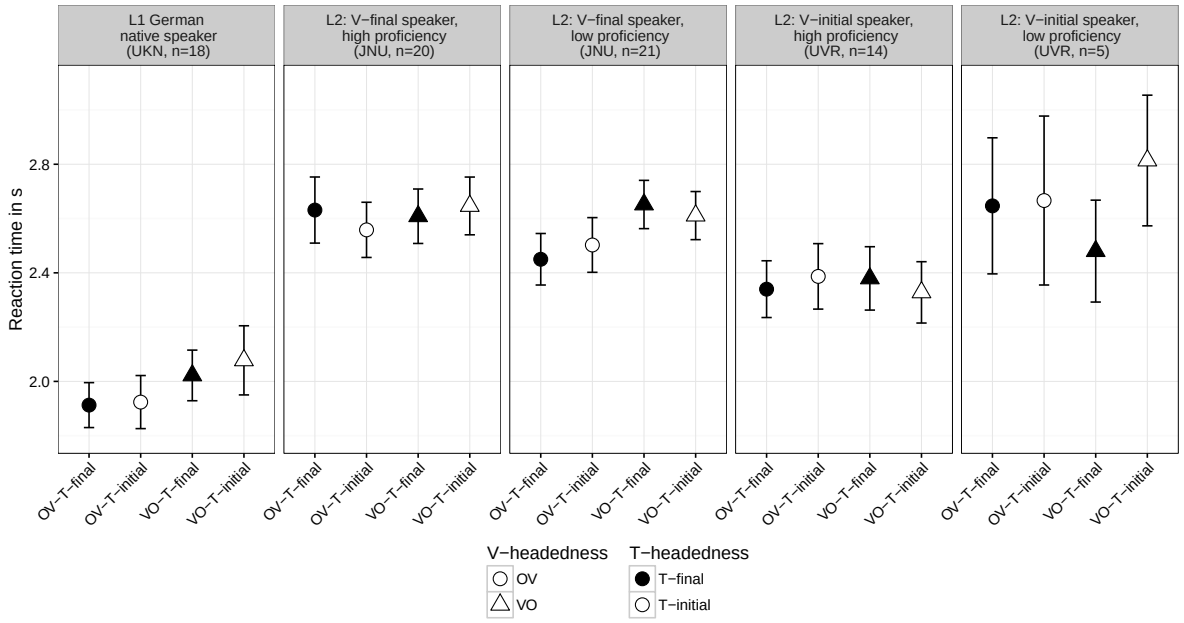


Figure 10.13: Mean reaction times for verb position in embedded clauses in Experiment 9 (95 % CIs)

10.5.5 Discussion

The tendentious preference for OV structures within the native speaker group is as expected. The mere fact that we could detect an effect for the native speakers in embedded clauses, although we did not find any contrast for matrix clauses (Experiment 8), supports the observation of Eubank (1993b) that native speakers may only show sensitivity in sentence matching tasks if the processing demands of the stimuli exceed a certain threshold.[15]

[15] Obviously, the processing demand is also dependent on the time pressure. Therefore a reduction of the presentation intervals might lead to stronger contrasts within the native speaker group.

Table 10.18: Output of the LME model for the native speakers in Experiment 9: Reaction time per experimental conditions.
`lmer(RT~V.headedness+T.headedness+(1+V.headedness*T.headedness|participant.ID)+(1+V.headedness+T.headedness|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (OV:T-final)	1.930	0.078	24.614	1.919	0.084	22.921
V.headedness (VO)	0.065	0.060	1.077	0.116	0.061	1.896
T.headedness (T-initial)	0.016	0.044	0.357	0.040	0.060	0.671

Table 10.19: Output of the LME model for the JNU-low group in Experiment 9: Reaction time per experimental conditions.
`lmer(RT~V.headedness+T.headedness+(1+V.headedness*T.headedness|participant.ID)+(1+V.headedness*T.headedness|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (OV:T-final)	2.452	0.123	19.927	2.460	0.124	19.785
V.headedness (VO)	0.138	0.055	2.536	0.155	0.056	2.745
T.headedness (T-initial)	0.009	0.055	0.164	−0.003	0.061	−0.054

Table 10.20: Output of the LME model for the UVR-low group in Experiment 9: Reaction time per experimental conditions.
`lmer(RT~V.headedness*T.headedness+(1+V.headedness*T.headedness|participant.ID)+(0+V.headedness*T.headedness|stimulus.ID))`

	criticized model			raw model		
	Estimate	SE	t	Estimate	SE	t
Intercept (VO:T-final)	2.484	0.187	13.306	2.481	0.182	13.633
V.headedness (OV)	0.076	0.242	0.314	0.147	0.219	0.672
T.headedness (T-initial)	0.380	0.156	2.433	0.327	0.180	1.810
OV:T-initial	−0.240	0.233	−1.030	−0.263	0.267	−0.983

The two low proficiency groups showed the expected effects. The low proficiency Indian learners (JNU-low) showed shorter reaction times for embedded clauses with OV order which was even more prominent with T-FINAL structures. This configuration matches both the structure of the native language and the structure of the target language. The low proficiency Italian learners, on the other hand, showed sensitivity to T-POSITION only in the VO-condition that matches the VP-order of the native language. It remains speculative what the source of this contrast actually is. The word order pattern that is identical to the native language T-INITIAL–VO is actually dispreferred in contrast to its T-FINAL pendant. I will take this as an indication that the L1-pattern causes interference effects that result in longer reaction times.

These results allow two conclusions: First, only the low proficiency learner showed sensitivity to the parametric manipulation of embedded clause order. This indicates that the high proficiency learners already developed the processing routines necessary to parse embedded sentences and to perform local repairs quite rapidly. The low proficiency learners, on the other hand, are still in a developmental stage in which they rely on their native language parsing routines, at least for the lexical VP. Second, the observed patterns can be interpreted as a kind of harmony effect. For the Indian learners, all newly developed parsing routines are in harmony with the routines of their native language. For the Italian learners, on the other hand, the newly acquired routines are disharmonic to the native language's routines. If the participants are confronted by an L1-structure with L2-material in the sentence matching tasks, this disharmony may lead to longer reaction times. By and large, these results also support the conclusion that functional structure may be transferred from the L1.

10.6 General discussion

The different experimental methods lead to a heterogeneous collection of data that did not straightforwardly support the idealized hypotheses given at the beginning of this chapter. Nevertheless, the combination of these different aspects provided several interesting insights about the L2-acquisition of German.

To sum up, the elicited production revealed that sentence-initial, complementizerless embedded clauses (*wh*-interrogative) caused a raise in erroneous V2-order across participant groups – an effect that also showed up in the low correction rates of the JNU-low groups in the elicited imitation task. I took this as an indication that the learners already established a syntactic analysis in which complementizer and verb movement in German occupy the same position but still rely on overt cues. The general correction rate, i. e. the automatized production of V-final embedded clauses, rises with increasing proficiency. Effects that correspond to the L1-grammar have only been found for the omission of the finite auxiliary. I have argued that this indicates problems in the encoding process. Doubling of the finite verb was only present in responses of the JNU-low group. In the sentence matching task, the native speakers were basically insensitive to the word order manipulation. This does not only mean that not only parsing of licit linearizations is highly automatized but also repair of deviant structures. The Indian learners did not show sensitivity to the VO order that is neither present in their native language nor in the target language. The JNU-high group showed a preference for V2-order matrix clauses and the JNU-low groups showed a preference for OV

order in the embedded clauses. The Italian learners, on the other hand, showed interference effects that are caused by disharmony with parameters of their native language.

Taken together, these effects indicate that parameters of functional phrase structure projection may be subject to transfer processes in L2-acquisition. In the experiments above those transfer effects could be related to encoding processes. However, the effects seem to be strongly task dependent. The Indian learners showed a higher rate of omission of the finite auxiliary in response to the V2-input in the elicited imitation task. This indicates that they have somehow more problems to cope with this input structure. The Italian learners do not show such an effect which indicates that their native SVO parsing routines provide an advantage in this respect. That these routines are involved in the parsing of L2 German was revealed in the sentence matching task. There, the Italian learners seem to be disturbed by structures that partly match their L1-configuration whereas the Indian learners did not show any sensitivity to SVO configurations.

The second main result concerns parallels to L1-acquisition: The sentence matching task using embedded clauses only revealed effects for low-proficiency learners, whereas the matrix clause variant also yielded effect for the high proficiency learners. This indicates that L2-learners, too, first develop routines for the underlying structure that surfaces in embedded clauses. The Indian learners may achieve this simply by transferring their L1-routines. The high proficiency learners seem to have developed those routines to such a high level that they may already repair deviating structures quite rapidly. Additionally, occurrences of verb doubling could only be detected for low proficiency Indian learners which indicates that verb doubling may be characteristic for the development of T-to-C movement building on T-final routines.

To conclude, I assume that learners transfer as much as possible. However, transfer may follow an implicational hierarchy corresponding to phrase structural projections. This explains why Swedish learners cannot directly transfer the V2-configuration from Swedish to German (see Section 9.3.2). In this combination, the more basic configurations of the VP and the TP are different. Hence the transfer of the higher order is blocked. Transfer of V2 (T-to-C) should therefore be possible among German, Dutch, Frisian, Afrikaans and Kashmiri since they are all OV, T-final and V2-languages. The same predictions hold, of course, among the VO, T-initial V2-languages: Mainland Scandinavian, Icelandic, Faroese.[16]

[16]I omitted Yiddish from the list intentionally. Assuming that Haider (2012: 97–105) is on the right track in suspecting that Yiddish is neither strictly VO nor strictly OV but a third type that is actually a relict from old Germanic, predictions for L1-transfer may not be straightforward.

11 Grand summary and conclusion

This dissertation makes three major contributions to the investigation of the V2-phenomenon which build on the well-established insight that the V2-order is a derived word order establishing a dependency between the base position and the surface position of the finite verb. First, the dissertation provides empirical evidence from linguistic and psycholinguistic investigations for the hypothesis that the lexical content of the V2-verb is reconstructed into and only interpreted in its base position. Verb reconstruction, therefore, provides a case in which language comprehension closely follows grammatical principles. Second, the discussion refines some details of the reconstruction process and relates it to other general properties of language processing in German. Third, with respect to L2-acquisition of German, the findings indicate that learners may show specific (dis)advantages due to transfer effects of grammatical knowledge and processing routines.

In the following, I briefly summarize the chapters and recapitulate the main conclusions and open issues.

Part I sets the scene with an introduction into the broader phenomenon of V2-movement and the presentation of the V2-Reconstruction Hypothesis – the core idea the dissertation is based on.

In Chapter 2, I illustrated the main properties of the V2-phenomenon. First, there must be a movement dependency between the base position of the finite verb and the V2-position with the latter being a derived position because, under certain conditions, specific verbs may only appear in the base position but not in the V2-position, whereas the reverse pattern is unattested. Second, V2-movement applies exceptionless, i. e. it cannot be suspended. In some cases, the application of V2-movement conflicts with another rule of grammar and would result in an ungrammatical structure. Crucially, however, the non-application of V2-movement in such cases also leads to ungrammaticality. The only possibility is to alter the sentence, e. g. by using a different verb form, such that both grammatical requirements can be satisfied. Third, V2-movement targets one specific position in the left periphery of the clause. While the filling of the prefield shows larger variation giving rise to V1- or V3-pattern, these patterns are very restricted in their interpretation and use conditions.

Chapter 3 introduced the central assumption, namely the V2-Reconstruction Hypothesis, according to which V2-movement affects only the finiteness features while the lexical part of the verb is pied-piped. Consequently, the lexical part has to be reconstructed into its base position, which is is also the only locus at which the lexical content of the verb is interpreted. Two groups of evidence were presented in support of the V2-Reconstruction Hypothesis: First, I showed that the V2-position is systematically filled with surface elements that are insufficient for interpretation (particle verbs), semantically empty (periphrastic *tun*), or outright ungrammatical if interpreted at this point (verb doubling). Second, using semantic

operators which require a c-command relation, such as association with focus, verbal NPIs and sentence negation, I provided evidence that the finite verb must be interpreted in its base position. Taken together, the results strongly support the V2-Reconstruction Hypothesis.

All in all, Part I provided the empirical and theoretical background to understand the significance and the implications of the V2-Reconstruction Hypothesis. Additionally, it also provided an empirical basis for the validity of the V2-Reconstruction Hypothesis whose predictions concerning language processing were applied in the next part. The discussion of Part I has shown that V2-movement is a rather abstract mechanism that attracts only the finiteness features or, as the data from complementizer agreement indicates, only the subset of subject-agreement features. However, it still remains unclear, why these features have to be realized in the left periphery in V2-languages. There exist several sophisticated accounts that connect V2-movement with the illocutionary potential of main clauses. As mentioned in Chapter 2, for now, these accounts seem to be language-specific. They may not be generalizable for all V2-languages and, moreover, do not explain why such a feature movement seems to be unnecessary in the majority of languages.

Part II provided a general introduction to language processing and sentence processing in German, followed by a series of on-line experiments which tested the predictions of the V2-Reconstruction Hypothesis. Finally, I explored some specifics of the reconstruction process based on theoretical arguments.

In Chapter 4, I sketched the basic properties of an on-line language comprehension model with a focus on the syntactic domain. I illustrated that deviations from strict on-line processing, as assumed by the V2-Reconstruction Hypothesis, occur regularly and are handled by one of two different processing strategies: anticipatory analysis with potential subsequent repairs, or delayed processing. Comparison with well-established manifestations of these two strategies in other languages and domains, especially the absence of garden paths effects, indicated that V2-clauses adhere to delayed processing. Additionally, a delayed processing as assumed under the V2-Reconstruction Hypothesis is also preferable for reasons of economy because the V2-position is frequently occupied by verbs that are either uninformative (auxiliaries, modals, etc.) or misleading with respect to the meaning of the predicate (particle verbs).

Chapter 5 reviewed previous findings regarding the processing of the core argument structure in German sentences. The review showed that argument orders that deviate from the canonical NOM$\prec$ACC$\prec$DAT order give rise to immediate processing responses, which are more local for scrambling and long-lasting for topicalization. These findings provided the background for experimental investigations of the influence of lexical V2-verbs on the processing of arguments. In this light, I reviewed on-line processing experiments on thematic structure, attachment ambiguities and scope computing in German. The results indicated that potentially verb-related effects only appeared rather late in the clauses as predicted by the V2-Reconstruction Hypothesis.

In Chapter 6, I presented four self-paced reading experiments that tested predictions of the V2-Reconstruction Hypothesis concerning on-line sentence processing. The experiments on verbal NPIs and the one on infinitive selection showed that the finite verb is automatically reconstructed into the first potential base position. Only subsequent interpretation could

reveal whether insertion of the verb led to ungrammaticality, e. g. in case of non-licensed NPIs or mismatching infinitive forms, which was reflected by increased reading times. The experiment on the interaction of verb types and argument order showed a verb-specific modulation of the argument-order preference at the reconstruction site of the verb. Additionally, the experimental manipulation led to other, less clear-cut, correlates appearing later and also earlier in the clause which must be further investigated to allow a clear interpretation.

In Chapter 7, I examined three aspects of how the reconstruction process should look like. First, subject-initial V2-clauses are special in that their structural representation can be generated with fewer restructuring operations. Second, I contrasted two realizations of verb reconstruction: lowering the verb cascadically after every incoming unit, or inserting incoming units directly before the verb. By applying the logic of temporary constituency to Right Node Raising structures in German V2-clauses, I constructed an argument against the cascading analysis and in favor of the insertion approach. Third, I argued that only the subject-verb agreement features on the finite verb are immediately interpreted. Other aspects of the verb are only interpreted after every incoming argument. The interpretation may be extended or altered during the course of the processing. However, once unambiguous cues for the clause-final base position are encountered, the parse is completed and the core meaning cannot be altered again, as evidenced by restrictions on extraposition.

Based on explicit assumptions about a human processing device, I explicated in this part how the predictions of the V2-Reconstruction Hypothesis are reflected in previous research on sentence comprehension in German. Furthermore, I presented the results of four specifically designed studies as additional support of the V2-Reconstruction Hypothesis. Finally, I discussed some details of the structural analysis and its relation to semantic interpretation in on-line processing. The experimental investigation of the V2-Reconstruction Hypothesis is the major contribution of this dissertation. The results support the hypothesis that there is an asymmetry between the syntactic realization of the finite verb and the semantic interpretation. While I have shown in Part I that this asymmetry is operative in the realm of grammar, the findings of this part showed that this asymmetry also holds on the level of language processing. This may provide the strongest case of grammar overruling inherent principles of on-line processing. It is clear that the investigations here can only be regarded as the beginning of an experimental endeavor aiming in a detailed understanding of how the linguistic representations are constructed in V2-environments. After all, the experimental results in this dissertation indicate that at least some meaning components of the verb, such as polarity-sensitivity and infinitive selection, are activated at a position different from the surface occurrence. This is an important result for any research on sentence processing in V2-languages because until now it has mostly been assumed, implicitly or explicitly, and without positive evidence that V2-sentences are processed/interpreted strictly incrementally. While future research must show which aspects enter the sentence processing routine immediately, the findings of this dissertation indicate that some information is only evaluated at the reconstruction site of the verb.

Part III dealt with the acquisition of word order, in particular V2-order, in first and second language acquisition. In connection to the V2-Reconstruction Hypothesis, a series of experiments investigated whether second language learners with different VP-headedness parameters show different developmental profiles.

Chapter 8 summarized the main findings on the L1-acquisition of the V2-order. From the two-word stage onward, children learning a V2-language produce the basic word order before V2-movement is developed with the realization of finiteness. A very specific pattern, which is taken as a direct reflection of the movement dependency of V2-structures, was observed across V2-languages: the double pronunciation of the finite verb in the V2-position and in the base position (verb doubling). The developmental steps of the L1-acquisition of V2-order were summarized in a 3-stage grammar model that extends the lexical VP by two functional phrases corresponding to IP and CP.

Chapter 9 summarized the current findings about V2-related L2-acquisition of German: In the initial learning stage, the order of object and verb seems to be transferred from the first language. Like in L1-acquisition, the lexical structure is extended by a head-initial functional projection which is initially filled by modals and auxiliaries. In contrast to the L1-patterns, the L2-learners seem to associate a structural subject position with this functional extension. In combination with sentence-initial adverbs, this results in the typical V3-error pattern reflecting an SVO-profile. Extending this analysis by a second head-initial functional phrase (CP) results in the second typical word-order error-pattern, namely, embedded clauses with a $S \prec V_{FIN} \prec O \prec V_{INF}$-order following the complementizer. Only subsequently, learners adjust their interlanguage grammar by resetting the headedness parameter of the lower functional phrase to head-final. This enforces V-to-C movement and eliminates both aforementioned error patterns.

In Chapter 10, I presented four psycholinguistic experiments which investigated the mastering of German word order by L2-learners and the characteristic error patterns. The L2-learners were recruited from 4 different groups, varying in L2-proficiency (low vs. high) and VP-headedness of the participants' L1 (Indian OV vs. Italian VO). The two production experiments indicated three main results: First, all participant groups showed higher erroneous V2-rates for clause-initial embedded clauses that lack an overt complementizer, i. e. *wh*-interrogatives, indicating that they established a dependency between V2-movement and overt complementizers. Second, the Indian learners more often omitted the finite auxiliary in response to non-target-like embedded clauses with V2-order, which I interpreted as a sign of an encoding problem. Third, only the low-proficiency–OV group showed significant proportion of verb-doubling cases, paralleling the L1-acquisition. The two comprehension experiments indicated that L2-learners develop parsing routines in at least to steps: first for lexical projections and subsequently for the functional extensions. Additionally, it seems that mismatching L1-routines disturb L2-parsing.

The findings of Part III corroborate the main idea of this dissertation by showing that the base position of the finite verb in German is central for the understanding of the German clause. Identifying the clause-final base position is a very early and central developmental step in L1-acquisition of German. The importance becomes apparent in L2-acquisition where the correct analysis of this position is a late step in the acquisition of word order, which results in specific error patterns. The experimental investigation of L2-learners with specific L1-differences indicated that L1-transfer might be diagnosed in language comprehension but not necessarily surface in the same way in language production. This raises an interesting question, namely whether transfer effects can ultimately be identified as targeting only grammar, only processing, or both. The answer to this question can only be a long-term objective

because it presumes a robust distinction of grammar and processing effects in the languages under consideration. However, as we have seen above, grammar and processing are strongly intertwined.

Taken together, this dissertation presented evidence from language acquisition and theoretical linguistics which shows that German V2-order is derived from an underlying V-final order. Moreover, I presented a hypothesis according to which the underlying base position is not only of relevance for grammar models but it is also the locus where the lexical content of the V2-moved verb will be interpreted. In support of this hypothesis, I have offered empirical evidence from grammatical regularities and from on-line processing experiments, confirming the psychological reality of the hypothesis.

Finally, I would like to add two remarks, one about the nature of V2-movement and one about the generality of the findings: First, the findings indicate that V2-movement is the consequence of the requirement to realize subject-verb agreement features in the left periphery. It remains open why these features have to be realized in the V2-position in V2-languages only. However, whereas the findings reveal that the lexical content of the V2-verb only enters the processing at a later point, it has been noted that the realization of the agreement features immediately impacts language processing. This shows that V2-movement is best characterized as I-to-C movement, which also becomes evident in languages that realize agreement features exclusively by clitics (Warpiri) or auxiliaries (O'odham) – these languages never move lexical verbs. Having this in mind, I must clearly oppose to the claim that V2-movement is non-syntactical in nature, as e. g. argued in Zwart (2017). As stated above, the pied-piping of other material, such as the lexical verb, is due to extrasyntactic factors whereas the movement of the agreement features is purely syntactic. In this way, deeming V2-movement as a whole non-syntactic misses crucial details of its nature. Second, the argumentation of this dissertation was mainly based on German. At numerous points, however, I drew comparisons to other V2-languages. Generally, I assume that the cause of V2-movement is identical in all V2-languages, namely that subject-verb agreement features must be realized in the left periphery. Consequently, the V2-Reconstruction Hypothesis applies to all other V2-languages as well. However, VO-languages, such as the Scandinavian languages, differ not only in the locus of the base position of the finite verb but, as I mentioned above, VO-parsing assumably differs parametrically from OV-parsing. This must certainly be considered if the findings of this dissertation will be adapted to those languages.

A Appendix

A.1 Instructions and materials from Experiment 1 (acceptability judgment task)

A.1.1 Instructions

Herzlich willkommen,

in diesem Experiment geht es um deine Sprachintuition.
Du sollst Sätze nach ihrer Akzeptabilität bewerten. Vertraue bei der Bearbeitung einfach deinem Bauchgefühl, es gibt kein “falsch”.

Da es um Intuition geht, ist es wichtig, keine speziellen Regeln auszuarbeiten. Bei der Bewertung der Sätze geht es auch nicht darum, dass die Sätze in einem guten Stil gehalten sind.
Allein deine persönliche Einschätzung zählt!

Das Experiment besteht aus zwei Teilen: einem Übungsteil und einem Experimentteil.
Für dieses Experiment wirst du ungefähr 20 Minuten benötigen.
Wir werden dir verschiedene Sätze präsentieren. Zu jedem Satz gehört ein kleiner Kontext, der nicht bewertet werden soll. Er hilft dir lediglich zu entscheiden, ob du den entsprechenden Satz in diesem Zusammenhang gut oder schlecht findest.
Während des gesamten Experiments wirst du folgenden Referenzsatz sehen:

-> Die Angestellten haben, dass der Chef Probleme hat, nicht sofort bemerkt. (0)

Diesem Referenzsatz ist der Wert 0 zugeordnet.

Du sollst den jeweiligen Zielsatz mit dem Referenzsatz vergleichen.
Ist der Zielsatz besser als der Referenzsatz, genau so gut, oder schlechter?
Wenn du den Zielsatz besser findest, bewerte ihn mit einer positiven Zahl (größer als 0).
Wenn du ihn schlechter findest, bewerte ihn mit einer negativen Zahl (kleiner als 0).

Nach unten und oben hin gibt es keine Begrenzungen. Das heißt, du hast die Möglichkeit, den Wertebereich deiner Beurteilung selbst zu bestimmen. Mach davon Gebrauch und unterscheide möglichst fein.

Benutze bitte nur ganze Zahlen und keine Kommazahlen (kein 2,5 etc.).
Wichtig!! Vergiss nicht negative Zahlen mit einem “-” zu markieren.

Hier ein Beispiel:

Zuerst der Referenzsatz:

-> Die Angestellten haben, dass der Chef Probleme hat, nicht sofort bemerkt. (0)

Danach ein Kontext und der Zielsatz, der bewertet werden soll:

Kontext: Peter ist Manager einer großen Firma. Deswegen hat er immer einen vollen Terminkalender und selten Zeit für private Besuche.

-> Ich freue mich, dass Peter trotz seiner Termine morgen vorbeikommen wird. (+20)

Dieser Satz ist für dich eventuell leichter verständlich/natürlicher als der Referenzsatz. Ihm könnte man also eine positive Zahl zuweisen, wie hier beispielsweise +20.

Hier noch ein Beispiel:

Hier ist der Referenzsatz:

-> Die Angestellten haben, dass der Chef Probleme hat, nicht sofort bemerkt. (0)

Danach der Zielsatz:

Kontext: Peter ist Manager einer großen Firma. Deswegen hat er immer einen vollen Terminkalender.

-> Ich freue, dass Peter trotz seiner Termine morgen vorbeikommen wird, mich. (-30)

Dieser Satz ist schlechter/weniger natürlich als der Referenzsatz. Ihm könnte man also eine negative Zahl zuweisen, z.B. -30.

Denk daran, es geht allein um dein Bauchgefühl.

Du könntest den Beispielsätzen durchaus eine schlechtere oder eine bessere Bewertung zuweisen, als die oben genannten Werte (+20 und -30).

Es gibt keine richtigen und keine falschen Antworten. Entscheide zügig und intuitiv, aus dem Bauch heraus.

Alles klar?

Dann gibt es jetzt noch vier Sätze zum Üben:

– practice phase –

Die Übung ist geschafft!

Falls du noch Fragen hast, dann wende dich jetzt an den Versuchsleiter.

Falls du keine Fragen hast, dann sag dem Versuchsleiter Bescheid und beginne mit dem Experiment.

A.1.2 Practice items

1. ID: *practice1*

Context: Im Sommer wollen alle Kinder zum Baggersee.

Target: Folglich sind die Wiesen dort dann richtig voll.

2. ID: *practice2*

Context: Der junge Mann war nur mit seinem Hund spazieren, als ihn zwei entgegenkommende Gestalten mit einer Taschenlampe blendeten.

Target: Die zwei Polizeibeamten wollten wissen, wer und warum er hier sei.

3. ID: *practice3*

Context: Als es plötzlich weg war, war die Aufregung groß. Zum Glück ist es wieder aufgetaucht.

Target: Das Taschenmesser, das viele Funktionen, die oftmals nützlich sind, besitzt, hat der Pfadfinder gefunden.

4. ID: *practice4*

Context: Sicherlich gibt es auch Kulturen, in denen Schadenfreude noch ausgeprägter ist. Aber das ging doch etwas zu weit. Und das müssen Jugendliche auch lernen.

Target: Einer der Mitschüler hat gelacht, warum sich die Klassensprecherin verletzt hat.

A.1.3 Experimental items

1. ID: *wiegen-active*, verb-type: *action*

Context: In der Bäckerei läuft die Produktion wie an einem Fließband. Jeder Beteiligte führt einen Arbeitsschritt aus.

Lex.-V2: Der Geselle wiegt die Teigportionen für die Brötchen.

***tun*-Per.**: Der Geselle tut die Teigportionen für die Brötchen wiegen.

VP-Top.: Die Teigportionen für die Brötchen wiegen tut der Geselle.

2. ID: *streichen*, verb-type: *action*

Context: Weil der Traktor kaputt ist und gerade repariert wird, kann niemand auf dem Feld arbeiten.

Lex.-V2: Der Bauer streicht stattdessen den Schuppen.

***tun*-Per.**: Der Bauer tut stattdessen den Schuppen streichen.

VP-Top.: Den Schuppen streichen tut der Bauer stattdessen.

3. ID: *reparieren*, verb-type: *action*

Context: Derzeit geht es ihr zu langsam voran. Also wirft die Chefin der Autowerkstatt einen Blick durch die Scheibe in den Werkstattraum.

Lex.-V2: Der Lehrling repariert immer noch den alten Golf.

***tun*-Per.:** Der Lehrling tut immer noch den alten Golf reparieren.

VP-Top.: Den alten Golf reparieren tut der Lehrling immer noch.

4. ID: *putzen*, verb-type: *action*

Context: Heute ist mal wieder wenig Kundenverkehr. Dann werden die Aufgaben erledigt, für die sonst keine Zeit ist.

Lex.-V2: Der Auszubildende putzt das Lager von oben bis unten.

***tun*-Per.:** Der Auszubildende tut das Lager von oben bis unten putzen.

VP-Top.: Das Lager putzen tut der Auszubildende von oben bis unten.

5. ID: *schlagen*, verb-type: *action*

Context: Die Passanten können nicht glauben, welche Szenen sich an der zentralen Haltestelle abspielen.

Lex.-V2: Ein wütender Busfahrer schlägt einem tattrigen Rentner wiederholt ins Gesicht.

***tun*-Per.:** Ein wütender Busfahrer tut einem tattrigen Rentner wiederholt ins Gesicht schlagen.

VP-Top.: Einem tattrigen Rentner wiederholt ins Gesicht schlagen tut ein wütender Busfahrer.

6. ID: *begruessen*, verb-type: *action*

Context: Man hört ja immer wieder von Lehrermangel an Schulen. Neu ist, dass dies nun schon an Grundschulen, direkt bei der Einschulung beginnt.

Lex.-V2: Ein Referendar begrüßt dieses Jahr die neu eingeschulte Klasse.

***tun*-Per.:** Ein Referendar tut dieses Jahr die neu eingeschulte Klasse begrüßen.

VP-Top.: Die neu eingeschulte Klasse begrüßen tut ein Referendar dieses Jahr.

7. ID: *umarmen*, verb-type: *action*

Context: In dieser Familie ist das Verhältnis zwischen dem Sohn und den Eltern doch eher angespannt. Daher ist auch die Verabschiedung nicht allzu herzlich.

Lex.-V2: Nur die Mutter umarmt den abreisenden Sohn.

***tun*-Per.:** Nur die Mutter tut den abreisenden Sohn umarmen.

VP-Top.: Den abreisenden Sohn umarmen tut nur die Mutter.

8. ID: *pflegen*, verb-type: *action*

Context: Immer wieder hört man davon, dass alte Menschen häufig ins Heim abgeschoben werden. Aber einige Prominente zeigen sich als gute Vorbilder.

Lex.-V2: Auch der Gesundheitsminister pflegt seine demente Mutter.

***tun*-Per.:** Auch der Gesundheitsminister tut seine demente Mutter pflegen.

VP-Top.: Seine demente Mutter pflegen tut auch der Gesundheitsminister.

9. ID: *schwimmen*, verb-type: *action*

Context: Neuerdings wird Querschnittsgelähmten in der Bewegungstherapie eine spezielle Schwimmtechnik beigebracht. Die ersten Erfolge sind enorm.

Lex.-V2: Der gelähmte Patient schwimmt jeden Morgen zwei Bahnen.

***tun*-Per.:** Der gelähmte Patient tut jeden Morgen zwei Bahnen schwimmen.

VP-Top.: Zwei Bahnen schwimmen tut der gelähmte Patient jeden Morgen.

10. ID: *springen*, verb-type: *action*

Context: Manche Kinder können sich wunderbar mit sich selbst beschäftigen, ganz ohne Fernseher und Konsolen.

Lex.-V2: Der Nachbarsjunge springt zum Beispiel auf den Stromkasten.

***tun*-Per.:** Der Nachbarsjunge tut zum Beispiel auf den Stromkasten springen.

VP-Top.: Auf den Stromkasten springen tut der Nachbarsjunge zum Beispiel.

11. ID: *schimpfen*, verb-type: *action*

Context: Die deutsche Bahn gerät immer wieder in die Kritik. Auch in den Zügen äußern manche ihre Unzufiedenheit.

Lex.-V2: Eine alte Dame schimpft lautstark über die Pünktlichkeit der Züge.

***tun*-Per.:** Eine alte Dame tut lautstark über die Pünktlichkeit der Züge schimpfen.

VP-Top.: Über die Pünktlichkeit der Züge schimpfen tut eine alte Dame lautstark.

12. ID: *klopfen*, verb-type: *action*

Context: Elektrogeräte sind schon seltsam. Bei manchen Defekten helfen erstaunlich einfache Mittel. So, wie bei unserem alten Fernseher.

Lex.-V2: Der erfahrene Mechaniker klopft einfach nur auf die Rückwand.

***tun*-Per.:** Der erfahrene Mechaniker tut einfach nur auf die Rückwand klopfen.

VP-Top.: Einfach nur auf die Rückwand klopfen tut der erfahrene Mechaniker.

13. ID: *liegen-position*, verb-type: *K-states*

Context: Das Königreich Kongan ist eher unbekannt. Dabei besitzt es eine außergewöhnliche Eigenschaft.

Lex.-V2: Die Hauptstadt liegt beinahe exakt in der Landesmitte.

***tun*-Per.:** Die Hauptstadt tut beinahe exakt in der Landesmitte liegen.

VP-Top.: Beinahe exakt in der Landesmitte liegen tut die Hauptstadt.

14. ID: *stecken*, verb-type: *K-states*

Context: Taucher haben das Wrack eines uralten Schiffes gefunden. Es scheint beinahe senkrecht nach unten gesunken zu sein.

Lex.-V2: Die Bugspitze steckt jedenfalls metertief in dem schlammigen Meeresboden.

***tun*-Per.:** Die Bugspitze tut jedenfalls metertief in dem schlammigen Meeresboden stecken.

VP-Top.: Metertief in dem schlammigen Meeresboden stecken tut die Bugspitze jedenfalls.

15. ID: *ragen*, verb-type: *K-states*

Context: Die Steilküste an der Südspitze Irlands ist außergewöhnlich. Besondere Aufmerksamkeit erregt der Aussichtspunkt bei dem Dorf Geroiller.

Lex.-V2: Die Felskante ragt mehrere Meter über das Meer.

***tun*-Per.:** Die Felskante tut mehrere Meter über das Meer ragen.

VP-Top.: Mehrere Meter über das Meer ragen tut die Felskante.

16. ID: *zaehlen*, verb-type: *K-states*

Context: Seit vielen Jahren wurde der Schneekamm aus politischen Gründen verschiedenen Gebirgen zugeordnet. Nach neuen mineralogischen Untersuchungen ist die Sache klar.

Lex.-V2: Dieser Berg zählt eindeutig zu den Dolomiten.

***tun*-Per.:** Dieser Berg tut eindeutig zu den Dolomiten zählen.

VP-Top.: Zu den Dolomiten zählen tut dieser Berg eindeutig.

17. ID: *besitzen*, verb-type: *K-states*

Context: In vielen Sportvereinen erleben Kinder unangenehme Zeiten, da sie nur nach Leistung bewertet werden. In unserer Mannschaft ist das nicht so und das liegt an unserem Trainer.

Lex.-V2: Unser Trainer besitzt einen guten Charakter.

***tun*-Per.:** Unser Trainer tut einen guten Charakter besitzen.

VP-Top.: Einen guten Charakter besitzen tut unser Trainer.

18. ID: *ähneln*, verb-type: *K-states*

Context: Viele Kunden haben gedacht, die Metzgerei sei verkauft worden, nur weil ein neues Gesicht im Verkaufsraum steht. Ich kann das nicht nachvollziehen.

Lex.-V2: Der neue Metzger ähnelt seinem Vater doch sehr.

***tun*-Per.:** Der neue Metzger tut seinem Vater doch sehr ähneln.

VP-Top.: Seinem Vater ähneln tut der neue Metzger doch sehr.

19. ID: *wissen*, verb-type: *K-states*

Context: Der Mathelehrer versucht in den mündlichen Prüfungen möglichst viele Hilfestellungen zu geben. Diesmal scheint das aber nicht zu helfen.

Lex.-V2: Der nervöse Schüler weiß die Antwort trotzdem nicht.

***tun*-Per.:** Der nervöse Schüler tut die Antwort trotzdem nicht wissen.

VP-Top.: Die Antwort wissen tut der nervöse Schüler trotzdem nicht.

20. ID: *kennen*, verb-type: *K-states*

Context: Nachdem der alte Chef in Rente gegangen ist, wird die Stelle neu besetzt. Er hat schon viel von der neuen Abteilungsleiterin gehört.

Lex.-V2: Der Sachbearbeiter kennt die neue Chefin aber noch nicht.

***tun*-Per.:** Der Sachbearbeiter tut die neue Chefin aber noch nicht kennen.

VP-Top.: Kennen tut der Sachbearbeiter die neue Chefin aber noch nicht.

21. ID: *kosten*, verb-type: *K-states*

Context: Wissenschaftlich nachgewiesen ist es noch nicht, dass die kostenpflichtige Ulltraschall-untersuchung einen signifikanten Nutzen hat. Allerdings ist sie nicht besonders teuer.

Lex.-V2: Diese Behandlung kostet derzeit weniger als 10 Euro.

***tun*-Per.:** Diese Behandlung tut derzeit weniger als 10 Euro kosten.

VP-Top.: Kosten tut diese Behandlung derzeit weniger als 10 Euro.

22. ID: *wiegen-state*, verb-type: *K-states*

Context: Nachdem alle Schätzungen abgegeben wurden, darf ich das Ergebnis verkünden. Zuvor sei gesagt, dass niemand das Gewicht erraten hat.

Lex.-V2: Dieser Thunfisch wiegt knapp vierzig Kilogramm.

***tun*-Per.:** Dieser Thunfisch tut knapp vierzig Kilogramm wiegen.

VP-Top.: Knapp vierzig Kilogramm wiegen tut dieser Thunfisch.

23. ID: *dauern*, verb-type: *K-states*

Context: Was die Fahrzeiten anging dachten wir noch in europäischen Maßstäben. Und die Städte liegen ja quasi nebeneinander. Die Auskunft hat uns dann schon überrascht.

Lex.-V2: Die Zugfahrt dauert mindestens drei Stunden.

***tun*-Per.:** Die Zugfahrt tut mindestens drei Stunden dauern.

VP-Top.: Mindestens drei Stunden dauern tut die Zugfahrt.

24. ID: *umfassen*, verb-type: *K-states*

Context: In der Klausurvorbereitung sind die Studenten jedes Jahr überrascht, was alles abgefragt wird. Dabei sollte das doch klar sein.

Lex.-V2: Die Prüfung umfasst eben nun mal alle Pflichtbereiche.

***tun*-Per.:** Die Prüfung tut eben nun mal alle Pflichtbereiche umfassen.

VP-Top.: Umfassen tut die Prüfung eben nun mal alle Pflichtbereiche.

25. ID: *schwimmen-stat*, verb-type: *D-states*

Context: Schiffe betanken ist eine heikle Angelegenheit, da immer wieder Treibstoff ins Wasser gelangt. Für die Inspektoren ist es jedoch einfach zu überprüfen, ob jemand gepatzt hat.

Lex.-V2: Der Diesel schwimmt immer an der Oberfläche.

***tun*-Per.:** Der Diesel tut immer an der Oberfläche schwimmen.

VP-Top.: An der Oberfläche schwimmen tut der Diesel immer.

26. ID: *stehen*, verb-type: *D-states*

Context: Die neuen Besitzer hatten gedacht, sie könnten das Gundstück nach ihren Wünschen umgestalten. Aber das Umweltamt bescherte ihnen wegen der Bepflanzung strikte Auflagen. Dabei ist die Sache doch klar.

Lex.-V2: Der ungeliebte Baum steht mitten in der Einfahrt.

***tun*-Per.:** Der ungeliebte Baum tut mitten in der Einfahrt stehen.

VP-Top.: Mitten in der Einfahrt stehen tut der ungeliebte Baum.

27. ID: *sitzen*, verb-type: *D-states*

Context: Der Vater verräumt die Koffer und die Mutter überprüft noch einmal, ob alle Fenster und Türen verschlossen sind. Wie jedes Jahr beginnt kurz vor der Abfahrt in den Sommerurlaub die große Hektik. Zumindest bei den Erwachsenen.

Lex.-V2: Die Tochter sitzt bereits im Auto.

***tun*-Per.:** Die Tochter tut bereits im Auto sitzen.

VP-Top.: Bereits im Auto sitzen tut die Tochter.

28. ID: *liegen-body-posture*, verb-type: *D-states*

Context: Schwer zu sagen, wo der Spieler tatsächlich gefoult wurde. Es scheint aber so, als hätte er sich ernsthaft verletzt.

Lex.-V2: Der Stürmer liegt immer noch an der Strafraumgrenze.

***tun*-Per.:** Der Stürmer tut immer noch an der Strafraumgrenze liegen.

VP-Top.: Immer noch an der Strafraumgrenze liegen tut der Stürmer.

29. ID: *leuchten*, verb-type: *D-states*

Context: Viele Lebewesen der Tiefsee verfügen über Biolumineszens. Hier sehen wir einen Landbewohner, der diese Eigenschaft hat.

Lex.-V2: Dieses asiatische Glühwürmchen leuchtet in einem kräftigen Grün.

***tun*-Per.:** Dieses asiatische Glühwürmchen tut in einem kräftigen Grün leuchten.

VP-Top.: In einem kräftigen Grün leuchten tut dieses asiatische Glühwürmchen.

30. ID: *schimmern*, verb-type: *D-states*

Context: Ein Kunde hat sich den neuen Porsche mit einem Flip-Flop-Effekt bestellt. Das war in den 90er Jahren sehr beliebt. Heute sieht man das kaum mehr.

Lex.-V2: Dieser Autolack schimmert in mehreren Farben.

***tun*-Per.:** Dieser Autolack tut in mehreren Farben schimmern.

VP-Top.: In mehreren Farben schimmern tut dieser Autolack.

31. ID: *summen*, verb-type: *D-states*

Context: In der Küche meiner Oma hört man abends wirklich komische Geräusche. Vor allem die alten Elektrogeräte jagen mir regelmäßig einen Schrecken ein.

Lex.-V2: Der Kühlschrank summt in der gleichen Frequenz wie ein Bienschwarm.

***tun*-Per.:** Der Kühlschrank tut in der gleichen Frequenz wie ein Bienschwarm summen.

VP-Top.: Summen tut der Kühlschrank in der gleichen Frequenz wie ein Bienschwarm.

32. ID: *dröhnen*, verb-type: *D-states*

Context: Unser Nachbar ist ein Motorsport-Fan. Er liebt es, wenn seine Fahrzeuge klassische Geräusche machen. Auch die Gartengeräte sind davon nicht ausgenommen.

Lex.-V2: Der Rasenmäher dröhnt jeden Samstag über mehrere Stunden hinweg.

***tun*-Per.:** Der Rasenmäher tut jeden Samstag über mehrere Stunden hinweg dröhnen.

VP-Top.: Über mehrere Stunden hinweg dröhnen tut der Rasenmäher jeden Samstag.

33. ID: *warten*, verb-type: *D-states*

Context: Die Ärztin hatte ihm versprochen sofort anzurufen, wenn die Operation seines Sohnes vorbei ist.

Lex.-V2: Der Vater wartet nun schon seit Stunden auf den entscheidenden Anruf.

***tun*-Per.:** Der Vater tut nun schon seit Stunden auf den entscheidenden Anruf warten.

VP-Top.: Auf den entscheidenden Anruf warten tut der Vater nun schon seit Stunden.

34. ID: *schlafen*, verb-type: *D-states*

Context: Mein Bruder ist nie gut organisiert. Aber ich bin schon baff als ich dann spät abends in den Schlafraum komme.

Lex.-V2: Mein Bruder schläft da einfach so auf meiner Luftmatratze.

***tun*-Per.:** Mein Bruder tut da einfach so auf meiner Luftmatratze schlafen.

VP-Top.: Auf meiner Luftmatratze schlafen tut mein Bruder da einfach so.

35. ID: *zittern*, verb-type: *D-states*

Context: Die Kinder hören ein seltsames Geräusch im Schnee. Den ausgesetzten Hund sehen sie aber erst, als sie direkt davor stehen.

Lex.-V2: Der kleine Welpe zittert am ganzen Körper.

***tun*-Per.:** Der kleine Welpe tut am ganzen Körper zittern.

VP-Top.: Am ganzen Körper zittern tut der kleine Welpe.

36. ID: *schwitzen*, verb-type: *D-states*

Context: Eine Patientin wird mit hohem Fieber ins Krankenhaus eingeliefert. Allerdings sieht man ihr die Temperatur kaum an.

Lex.-V2: Die Patientin schwitzt lediglich an den Beinen.

***tun*-Per.:** Die Patientin tut lediglich an den Beinen schwitzen.

VP-Top.: Schwitzen tut die Patientin lediglich an den Beinen.

A.2 Instructions and materials from Experiment 2 (self-paced reading task)

A.2.1 Instructions

Herzlich willkommen.

In diesem Versuch werden Sie einige Textpassagen auf dem Computerbildschirm lesen.

Jede Textpassage beginnt mit einem Kreuz in der Mitte des Bildschirms.

Die Sätze werden ihnen Wort für Wort präsentiert.
Wenn Sie die Leertaste drücken, wird das aktuelle Wort verschwinden und ein neues erscheinen.

Versuchen Sie, so normal wie möglich zu lesen und gehen Sie dabei sicher, dass Sie verstehen, was Sie lesen.

Nach dem letzten Wort einer Passage erscheint entweder ein Kreuz, das eine neue Textpassage ankündigt, oder eine Frage.

Erscheint nach einer Textpassage eine Frage beantworten Sie diese, indem Sie die F-Taste für NEIN und die J-Taste für JA betätigen.
Versuchen Sie, so schnell und so genau wie möglich zu antworten.

Wenn Sie sich mit der Antwort nicht ganz sicher sind (oder wenn Sie meinen, dass beide Antworten richtig sind), entscheiden Sie sich für die bestmögliche Antwort.

Um möglichst schnell lesen und antworten zu können, lassen Sie am besten die Finger auf der Leertaste und auf F und J, so dass Sie bei den Antworten nicht nachschauen müssen.
Sie können die Hand benutzen, die Ihnen am liebsten ist, oder auch beide Hände.

Machen Sie Pause, wann immer Sie eine benötigen, aber bitte versuchen Sie nur zu Beginn einer Textpassage Pause zu machen, d.h. wenn auf dem Bildschirm ein Kreuz zu sehen ist.

Nach einer bestimmten Anzahl von Sätzen bietet Ihnen der Computer von selbst eine Pause an, die Sie beenden können, indem Sie auf die Leertaste drücken.

Am Ende des Versuchs werden Sie einen Bildschirm sehen, der Ihnen mitteilt, dass der Versuch vorbei ist. Dann sollten Sie den Versuchsleiter wissen lassen, dass Sie fertig sind.

Wenn Sie noch Fragen haben, fragen Sie den Versuchsleiter jetzt.
Ansonsten werden Sie ein paar Übungssätze sehen, um sich an den Ablauf zu gewöhnen.

Jetzt also eine kleine Übung.
Los geht's …

– *practice phase* –

Das soll als Probe genügen.

Wenn Sie noch Fragen haben, fragen Sie!

Wenn Sie bereit sind anzufangen, sagen Sie dem Versuchsleiter Bescheid.

A.2.2 Practice items

1. ID: *practice1*
   Dies ist ein einfacher Übungssatz, die Wörter erscheinen mit einem Tastendruck.

   – instruction: *Noch ein Satz zur Probe ... –*

2. ID: *practice2*

   Target: Nach diesem Satz werden wir eine Frage stellen, drücken Sie bitte ”J” für ”JA”.

   Question: Haben Sie gerade einen Satz gelesen?

   – instruction: *Im nächsten Satz werden Sie sehen was passiert, wenn Sie eine falsche Antwort geben.*
   Also los ... –

3. ID: *practice3*

   Target: Das ist ein Satz auf den Sie bitte mit ”F” antworten sollen, um sehen zu können was passiert, wenn sie falsch antworten.

   Question: Drücken Sie bitte die ”F” Taste!

   – instruction: *Die nächsten Probesätze und Fragen sind den eigentlichen Versuchssätzen schon ähnlicher.*
   Also los ... –

4. ID: *practice4*

   Target: Das ist vielleicht ein Wetter, ich bin schon ganz nassgeregnet!

   Question: Ist heute gutes Wetter?

5. ID: *practice5*

   Target: Dass Fußgänger Ampeln ignorieren, wundert den Polizisten, aber nicht den Arzt.

   Question: Wundert sich der Polizist?

6. ID: *practice6*

   Context: Experten finden seltene Bücher nur in Bibliotheken und in Antiquariaten. Denn normale Buchläden haben kein Interesse daran teure Bücher lange Zeit aufzubewahren bis irgendwann ein Käufer kommt der diese auch kaufen möchte.

   Target: Also suchen Experten gar nicht in diesen Läden.

   Question: Finden Experten seltene Bücher in normalen Buchläden?

7. ID: *practice7*

   Context: Mario war diesen Sommer während der Urlaubszeit auf einer griechischen Insel unterwegs. Weil es ziemlich heiß war, bekam Mario schon nach kurzer Zeit großen Durst. Als er in einen Supermarkt gehen wollte erlebte er eine Überraschung.

Target: Der Marktleiter hat Mario, der lediglich ein Wasser kaufen wollte, nur aus Argwohn nicht in den Laden gelassen.

Question: War Mario auf einer griechischen Insel unterwegs?

A.2.3 Experimental items

1. ID: *autor*

Context: Ein Autor hat wegen seines neuen Romans Ärger mit seinem Verlag. Er bespricht mit seinem Anwalt, ob er den Druck untersagen soll.

+NPI: Letztendlich braucht der Autor den Roman (nicht) zu drucken unter Umständen (nicht) zu verbieten, um das mediale Interesse zu wecken.

−NPI: Letztendlich beschließt der Autor den Roman (nicht) zu drucken unter Umständen (nicht) zu verbieten, um das mediale Interesse zu wecken.

Question: Hat der Autor mit seinem Anwalt gesprochen? (Y)

2. ID: *haendler*

Context: Ein Händler hat bemerkt, dass einer seiner Verkäufer ihn bestohlen hat. Er denkt darüber nach wie er mit der Situation umgeht.

+NPI: Schlussendlich braucht der Händler den Diebstahl (nicht) zu melden im Nachhinein (nicht) zu versprechen, um die delikate Angelegenheit zu klären.

−NPI: Schlussendlich beschließt der Händler den Diebstahl (nicht) zu melden im Nachhinein (nicht) zu versprechen, um die delikate Angelegenheit zu klären.

Question: Wurde der Händler von einem Kunden bestohlen? (N)

3. ID: *Angestellter*

Context: Ein Angestellter ist neu in der Firma. Er lässt sich von einem Verwaltungsmitarbeiter erklären wie Urlaubsangelegenheiten geregelt werden.

+NPI: Letztlich braucht der Angestellte den Urlaub (nicht) zu nehmen im Voraus (nicht) zu beantragen, um die gewünschte Vorgehensweise zu befolgen.

−NPI: Letztlich beschließt der Angestellte den Urlaub (nicht) zu nehmen im Voraus (nicht) zu beantragen, um die gewünschte Vorgehensweise zu befolgen.

Question: Erklärt ein Verwaltungsmitarbeiter dem Angestellten die Urlaubsangelegenheiten? (Y)

4. ID: *gaertner*

Context: Ein Gärtner wird von der Stadtverwaltung beauftragt ein Gutachten für eine alte, kranke Kastanie abzugeben. Weil er sich unsicher ist, fragt er einen Kollegen.

+NPI: Letztendlich braucht der Gärtner den Baum (nicht) zu fällen im Allgemeinen (nicht) zu empfehlen, um die alte Gartenanlage zu erhalten.

−NPI: Letztendlich beschließt der Gärtner den Baum (nicht) zu fällen im Allgemeinen (nicht) zu empfehlen, um die alte Gartenanlage zu erhalten.

Question: Möchte der Gärtner die Gartenanlage erhalten? (Y)

5. ID: *pilot*

Context: Ein Pilot ist sich unsicher, ob er wegen eines drohenden Unwetters den Flugplan präventiv ändern soll oder erst in der Luft. Er holt sich Rat bei seinem Vorgesetzten.

+NPI: Schlussendlich braucht der Pilot den Flugplan (nicht) zu ändern im Vornherein (nicht) zu beantragen, um der geltenden Dienstvorschrift zu genügen.

−NPI: Schlussendlich beschließt der Pilot den Flugplan (nicht) zu ändern im Vornherein (nicht) zu beantragen, um der geltenden Dienstvorschrift zu genügen.

Question: Hat der Pilot seinen Copiloten um Rat gefragt? (N)

6. ID: *kameramann*

Context: Ein Kameramann unterhält sich mit seinem Aufnahmeleiter über einen kurzfristigen Drehortwechsel. Am neuen Drehort herrschen nun andere Lichtverhältnisse als geplant.

+NPI: Letztlich braucht der Kameramann den Drehort (nicht) zu wechseln im Grunde (nicht) zu verweigern, um die geplanten Einstellungen zu verwirklichen.

−NPI: Letztlich beschließt der Kameramann den Drehort (nicht) zu wechseln im Grunde (nicht) zu verweigern, um die geplanten Einstellungen zu verwirklichen.

Question: Herrschen am neuen Drehort die geplanten Lichtverhältnisse? (N)

7. ID: *General*

Context: Ein General ist mit der Sicherheit seines Lagers betraut. Luftangriffe sind wegen der Kosten und der Gefahren nur als letztes Mittel einzusetzen.

+NPI: Letztendlich braucht der General den Luftangriff (nicht) zu beginnen dieses Mal (nicht) zu befehlen, um den umfassenden Schutz zu gewährleisten.

−NPI: Letztendlich beschließt der General den Luftangriff (nicht) zu beginnen dieses Mal (nicht) zu befehlen, um den umfassenden Schutz zu gewährleisten.

Question: Muss der General umfassenden Schutz gewährleisten? (Y)

8. ID: *schuster*

Context: Ein Schuster bekommt öfter Stiefel, die weniger wert sind als die Reparatur. Dann bespricht er mit den Kunden, ob er die Reparatur wirklich machen soll.

+NPI: Schlussendlich braucht der Schuster den Stiefel (nicht) zu flicken des Öfteren (nicht) zu empfehlen, um den individuellen Erwartungen zu entsprechen.

−NPI: Schlussendlich beschließt der Schuster den Stiefel (nicht) zu flicken des Öfteren (nicht) zu empfehlen, um den individuellen Erwartungen zu entsprechen.

Question: Empfiehlt der Schuster immer die Stiefel zu flicken? (N)

9. ID: *baecker*

Context: Ein Bäcker ließ heute wieder mal seinen Lehrling den Sauerteig prüfen. Kurz vor Feierabend sinnt er darüber nach den Teig selbst noch mal zu kontrollieren.

+NPI: Letztendlich braucht der Bäcker den Sauerteig (nicht) zu prüfen dieses Mal (nicht) zu wiederholen, um ein ruhiges Gewissen zu haben.

−NPI: Letztendlich beschließt der Bäcker den Sauerteig (nicht) zu prüfen dieses Mal (nicht) zu wiederholen, um ein ruhiges Gewissen zu haben.

Question: Hat der Bäcker den Praktikanten den Teig prüfen lassen? (N)

10. ID: *polizist*

Context: Ein Polizist wird wieder zu einem Park gerufen, wo Jugendliche lautstark feiern. Wie üblich versucht er die Situation ohne Androhung von Strafen zu klären.

+NPI: Letztlich braucht der Polizist den Platzverweis (nicht) zu erteilen unter Umständen (nicht) zu erwähnen, um die jugendlichen Störenfriede zu überzeugen.

−NPI: Letztlich beschließt der Polizist den Platzverweis (nicht) zu erteilen unter Umständen (nicht) zu erwähnen, um die jugendlichen Störenfriede zu überzeugen.

Question: Versucht der Polizist die Situation ohne Strafen zu klären? (Y)

11. ID: *student*

Context: Ein Student hat einen lukrativen Nebenjob. In der Prüfungsphase braucht er jedoch mehr Zeit, kann aber auf das Geld nur schwer verzichten.

+NPI: Schlussendlich braucht der Student den Nebenjob (nicht) zu kündigen im Grunde (nicht) zu erwägen, um die anstrengende Prüfungsphase zu überstehen.

−NPI: Schlussendlich beschließt der Student den Nebenjob (nicht) zu kündigen im Grunde (nicht) zu erwägen, um die anstrengende Prüfungsphase zu überstehen.

Question: Überlegt der Student einen weiteren Nebenjob anzunehmen? (N)

12. ID: *lieferant*

Context: Ein Lieferant hat einen Auftrag bei dem die Anzahlung aussteht. Je nach Auftragslage versucht er solche Aufträge entweder loszuwerden oder zu sichern.

+NPI: Letztendlich braucht der Lieferant den Auftrag (nicht) zu stornieren zur Zeit (nicht) zu fordern, um eine gleichmäßige Auslastung zu erreichen.

−NPI: Letztendlich beschließt der Lieferant den Auftrag (nicht) zu stornieren zur Zeit (nicht) zu fordern, um eine gleichmäßige Auslastung zu erreichen.

Question: Versucht der Lieferant eine gleichmäßige Auslastung zu erreichen? (Y)

13. ID: *maurer*

Context: Ein Maurer wird um Rat gefragt, ob man angesichts der Temperaturen den Blitzzement verwenden soll. Dieser härtet schneller aus, ist aber auch deutlich teurer.

+NPI: Letztlich braucht der Maurer den Blitzzement (nicht) zu verwenden dieses Mal (nicht) zu befürworten, um den reibungslosen Ablauf zu garantieren.

−NPI: Letztlich beschließt der Maurer den Blitzzement (nicht) zu verwenden dieses Mal (nicht) zu befürworten, um den reibungslosen Ablauf zu garantieren.

Question: Ist Blitzzement billiger als normaler Zement? (N)

14. ID: *mechaniker*

Context: Ein Mechaniker soll einen defekten Motor reparieren. Er ist sich unsicher für welche Reparaturen er eine Befugnis hat und spricht mit dem Vertreter seiner Vertragsfirma.

+NPI: Letztlich braucht der Mechaniker den Motor (nicht) zu zerlegen im Allgemeinen (nicht) zu verantworten, um den vollen Versicherungsschutz zu wahren.

−NPI: Letztlich beschließt der Mechaniker den Motor (nicht) zu zerlegen im Allgemeinen (nicht) zu verantworten, um den vollen Versicherungsschutz zu wahren.

Question: Hat der Mechaniker mit einem Vertreter geprochen? (Y)

15. ID: *taucher*

Context: Ein Taucher hat einen Tauchgang geplant. Nachdem er den Wetterbericht studiert hat, zweifelt er, ob alle Teilnehmer den Bedingungen gewachsen sind.

+NPI: Schlussendlich braucht der Taucher den Tauchgang (nicht) zu verschieben im Grunde (nicht) zu erwägen, um das gesundheitliche Risiko zu minimieren.

−NPI: Schlussendlich beschließt der Taucher den Tauchgang (nicht) zu verschieben im Grunde (nicht) zu erwägen, um das gesundheitliche Risiko zu minimieren.

Question: Versucht der Taucher das finanzielle Risiko zu minimieren? (N)

16. ID: *priester*

Context: Ein Priester bereitet eine Taufe vor. Die Familie des Kindes will einen eigenwilligen Taufspruch verwenden. Der Priester ist unsicher, ob er die Familie umstimmen soll.

+NPI: Letztendlich braucht der Priester den Taufspruch (nicht) zu ändern dieses Mal (nicht) zu diskutieren, um die anstehende Taufe zu gestatten.

−NPI: Letztendlich beschließt der Priester den Taufspruch (nicht) zu ändern dieses Mal (nicht) zu diskutieren, um die anstehende Taufe zu gestatten.

17. ID: *metzger*

Context: Ein Metzger hat einen Messerblock aus Holz und nicht wie üblich aus Kunststoff. Da bald eine Hygieneprüfung ansteht, informiert er sich über die aktuellen Bestimmungen.

+NPI: Letztlich braucht der Metzger den Messerblock (nicht) zu ersetzen wohl eher (nicht) zu überlegen, um den hygienischen Bestimmungen zu genügen.

−NPI: Letztlich beschließt der Metzger den Messerblock (nicht) zu ersetzen wohl eher (nicht) zu überlegen, um den hygienischen Bestimmungen zu genügen.

18. ID: *tierazt*

Context: Ein Tierarzt hat das Gefühl, dass sein Warteraum zu klein ist. Aus diesem Grund gibt er eine Untersuchung in Auftrag.

+NPI: Schlussendlich braucht der Tierarzt den Warteraum (nicht) zu vergrößern im Grunde (nicht) zu erstreben, um die mögliche Auslastung zu verbessern.

−NPI: Schlussendlich beschließt der Tierarzt den Warteraum (nicht) zu vergrößern im Grunde (nicht) zu erstreben, um die mögliche Auslastung zu verbessern.

19. ID: *fremdenfuehrer*

Context: Ein Fremdenführer ist im Zweifel, ob er auf seiner Tour den Bebauungsplan der Stadt erläutern soll. Dieser ist doch eine etwas trockene Angelegenheit.

+NPI: Letztlich braucht der Fremdenführer den Bebauungsplan (nicht) zu erläutern unter Umständen (nicht) zu überdenken, um eine verständliche Stadtgeschichte zu präsentieren.

−NPI: Letztlich beschließt der Fremdenführer den Bebauungsplan (nicht) zu erläutern unter Umständen (nicht) zu überdenken, um eine verständliche Stadtgeschichte zu präsentieren.

20. ID: *tuersteher*

Context: Ein Türsteher soll mit seinem Team regelmäßig den Parkplatz des Geländes kontrollieren. Im Moment steht wieder ein Rundgang an, jedoch ist am Eingang ein großes Gedränge.

+NPI: Schlussendlich braucht der Türsteher den Parkplatz (nicht) zu kontrollieren im Einzelfall (nicht) zu genehmigen, um die allgemeine Sicherheit zu garantieren.

−NPI: Schlussendlich beschließt der Türsteher den Parkplatz (nicht) zu kontrollieren im Einzelfall (nicht) zu genehmigen, um die allgemeine Sicherheit zu garantieren.

21. ID: *architekt*

Context: Ein Architekt trifft sich mit den Investoren eines Großprojekts. Er ist sich nicht sicher, ob er den Bauplan noch einmal überarbeiten wird und ob er das vor den Investoren geheim halten soll.

+NPI: Schlussendlich braucht der Architekt den Bauplan (nicht) zu überarbeiten unter Umständen (nicht) zu erwähnen, um die kritischen Investoren zu überzeugen.

−NPI: Schlussendlich beschließt der Architekt den Bauplan (nicht) zu überarbeiten unter Umständen (nicht) zu erwähnen, um die kritischen Investoren zu überzeugen.

22. ID: *hausmeister*

Context: Ein Hausmeister wird beauftragt den Luftfilter der Klimaanlage zu wechseln. Er ruft vorsichtshalber beim Hersteller an, um Fragen zur Garantie zu klären.

+NPI: Letztlich braucht der Hausmeister den Luftfilter (nicht) zu wechseln wohl eher (nicht) zu akzeptieren, um die rechtlichen Garantieansprüche zu wahren.

−NPI: Letztlich beschließt der Hausmeister den Luftfilter (nicht) zu wechseln wohl eher (nicht) zu akzeptieren, um die rechtlichen Garantieansprüche zu wahren.

23. ID: *schauspieler*

Context: Ein Schauspieler spricht mit einem Theaterregisseur. Sie diskutieren, ob man den Bühnenvorhang am Ende des Stückes einsetzen sollte.

+NPI: Letztendlich braucht der Schauspieler den Vorhang (nicht) zu senken im Grunde (nicht) zu fordern, um ein gelungenes Finale zu inszenieren.

−NPI: Letztendlich beschließt der Schauspieler den Vorhang (nicht) zu senken im Grunde (nicht) zu fordern, um ein gelungenes Finale zu inszenieren.

24. ID: *taenzer*

Context: Ein Tänzer hat sich eine Woche vor einem Auftritt eine leichte Fußverletzung zugezogen. Er spricht mit seinem Arzt, um herauszufinden, ob er mit dem Veranstalter über eine Absage sprechen muss.

+NPI: Schlussendlich braucht der Tänzer den Auftritt (nicht) zu streichen im Grunde (nicht) zu diskutieren, um das kleinere Übel zu wählen.

−NPI: Schlussendlich beschließt der Tänzer den Auftritt (nicht) zu streichen im Grunde (nicht) zu diskutieren, um das kleinere Übel zu wählen.

25. ID: *koch*

Context: Ein Koch wird zu einem Streit seiner Küchenjungen gerufen. Einer möchte den Gefrierschrank laut Hygieneplan entfrosten. Der andere meint, dass heute zu viel zu tun sei.

+NPI: Letztendlich braucht der Koch den Gefrierschrank (nicht) zu entfrosten nach Abwägung (nicht) zu untersagen, um die fälligen Aufgaben zu erledigen.

−NPI: Letztendlich beschließt der Koch den Gefrierschrank (nicht) zu entfrosten nach Abwägung (nicht) zu untersagen, um die fälligen Aufgaben zu erledigen.

26. ID: *friseur*

Context: Ein Friseur prüft die Fähigkeiten seines Lehrlings im Kurzhaarschneiden. Grundsätzlich ist es einfacher den Haarschneider zu verwenden.

+NPI: Letztlich braucht der Friseur den Haarschneider (nicht) zu benutzen am Ende (nicht) zu empfehlen, um einen guten Rat zu erteilen.

−NPI: Letztlich beschließt der Friseur den Haarschneider (nicht) zu benutzen am Ende (nicht) zu empfehlen, um einen guten Rat zu erteilen.

27. ID: *elektriker*

Context: Ein Elektriker wird in ein verwahrlostes Haus zur Inspektion gerufen. Er ist im Zwiespalt, ob er der Familie den Anschluss sperren oder nur die Gefahrenstellen ausbessern soll.

+NPI: Letztendlich braucht der Elektriker den Anschluss (nicht) zu sperren unter Umständen (nicht) zu verantworten, um eine gewissenhafte Entscheidung zu treffen.

−NPI: Letztendlich beschließt der Elektriker den Anschluss (nicht) zu sperren unter Umständen (nicht) zu verantworten, um eine gewissenhafte Entscheidung zu treffen.

28. ID: *gaphiker*

Context: Ein Graphiker soll für den Kunden ein Muster erstellen. Der Farbverlauf wird üblicherweise korrigiert. Manchmal führt das bei unfertigen Arbeiten jedoch zu seltsamen Ergebnissen.

+NPI: Letztlich braucht der Graphiker den Farbverlauf (nicht) zu überarbeiten dieses Mal (nicht) zu erzwingen, um ein präsentables Muster zu erzeugen.

−NPI: Letztlich beschließt der Graphiker den Farbverlauf (nicht) zu überarbeiten dieses Mal (nicht) zu erzwingen, um ein präsentables Muster zu erzeugen.

29. ID: *journalist*

Context: Ein Journalist hat einen Artikel über die enge Verflechtung von Regierung und Wirtschaft verfasst. Er ist sich aber unsicher welche Folgen dieser Artikel haben könnte.

+NPI: Letztendlich braucht der Journalist den Artikel (nicht) zu veröffentlichen unter Umständen (nicht) zu riskieren, um ein politisches Umdenken zu erwirken.

−NPI: Letztendlich beschließt der Journalist den Artikel (nicht) zu veröffentlichen unter Umständen (nicht) zu riskieren, um ein politisches Umdenken zu erwirken.

30. ID: *postbote*

Context: Ein Postbote wird von einer jungen Frau gefragt, ob er ein Brief für Frau Schneider habe. Da er die Frau nicht persönlich kennt, ist er sich unsicher, ob er ihr den Brief aushändigen soll.

+NPI: Letztlich braucht der Postbote den Brief (nicht) zu übergeben am Ende (nicht) zu wagen, um seine berufliche Pflicht zu erfüllen.

−NPI: Letztlich beschließt der Postbote den Brief (nicht) zu übergeben am Ende (nicht) zu wagen, um seine berufliche Pflicht zu erfüllen.

31. ID: *winzer*

Context: Ein Winzer ist im Zwiespalt, ob er den Preis für seinen Wein erhöhen soll. Zwar sind die Kosten gestiegen, aber er fürchtet dann weniger zu verkaufen.

+NPI: Letztendlich braucht der Winzer den Preis (nicht) zu erhöhen gerade jetzt (nicht) zu erwägen, um die gestiegenen Kosten zu decken.

−NPI: Letztendlich beschließt der Winzer den Preis (nicht) zu erhöhen gerade jetzt (nicht) zu erwägen, um die gestiegenen Kosten zu decken.

32. ID: *apotheker*

Context: Ein Apotheker wird von der Polizei gefragt, ob etwas aus seinem Giftbestand fehlt. Der Apotheker zögert, den Bestand tatsächlich zu überprüfen, da der Ruf der Apotheke leiden könnte.

+NPI: Schlussendlich braucht der Apotheker den Giftbestand (nicht) zu überprüfen nun doch (nicht) zu unterstützen, um die ehrwürdige Apotheke zu schützen.

−NPI: Schlussendlich beschließt der Apotheker den Giftbestand (nicht) zu überprüfen nun doch (nicht) zu unterstützen, um die ehrwürdige Apotheke zu schützen.

A.3 Instructions and materials from Experiment 3 and 4 (self-paced reading task)

A.3.1 Instructions

Herzlich willkommen,

in diesem Experiment sollst du Sätze so schnell und genau wie möglich lesen und anschließend dazu Fragen beantworten.

Für jedes Thema siehst du nacheinander:

1. einen Kontext, als Textblock
2. ein Fixationskreuz
3. einen Satz, Wort(gruppe) fü Wort(gruppe)
4. und eine Frage mit 2 Antwortmöglichkeiten

Mit der Leertaste geht es jeweils weiter.

Wichtig ist, aufmerksam zu lesen: Die Fragen können sich sowohl auf den Kontext, als auch auf den Satz beziehen.

Die Antwortmöglichkeiten erscheinen jeweils links und rechts auf dem Bildschirm. Die linke Antwort wählst du mit der 'd'-Taste und die rechte mit der 'k'-Taste.

Deine Aufgabe ist es:

1. die Sätze so schnell wie möglich zu lesen und
2. die Fragen so schnell wie möglich und korrekt zu beantworten

Um schnellstmöglich reagieren zu können, lass bitte deine Finger auf den Tasten liegen, damit du nicht erst zur Tastatur greifen musst.

Du wirst nun erstmal ein paar Übungssätze bekommen, um dich an den Ablauf zu gewöhnen.

Während des Experiments werden dir 2 Pausen angeboten, die du selbst mit der Leertaste beenden kannst.

Wenn du jetzt eine Frage hast, kannst du dich an den Versuchsleiter wenden.
Ansonsten beginnt jetzt die Übung.

– *practice phase* –

Das soll als Übung genügen.

Wenn du noch Fragen hast, dann wende dich jetzt an den Versuchsleiter.

Falls du keine Fragen hast, dann sag dem Versuchsleiter Bescheid und beginne mit dem Experiment.

A.3.2 Practice items

1. ID: *practice1*

Context: Jeden Abend um acht läuft auf der ARD die Tagesschau.

Target: Am Ende der Sendung kommt immer die Wettervorhersage.

Question: Wird am Ende über die Wetteraussichten gesprochen? (correct: Ja; false: Nein)

2. ID: *practice2*

Context: Den Echo-Preis soll es in Zukunft nicht mehr geben. Das verkündeten Vertreter der Musikindustrie nach einem Spitzentreffen in Hannover.

Target: Damit reagierten die Verantwortlichen auf einen Skandal um die Preisverleihung an Musiker, die sich fragwürdiger Textzeilen bedient haben.

Question: Wo fand das Spitzentreffen der Musikindustrie statt? (correct: in Hannover; false: in Berlin)

3. ID: *practice3*

Context: Von Schwedens Hauptstadt Stockholm aus untersuchten IT-Experten der Firma SecureSearch mehrere Jahre lang die Sicherheit von Fingerabdruckscannern. Die Experten fanden eine folgenschwere Sicherheitslücke in dem besonders sicher geltenden Schließsystem.

Target: Dieses Schließsystem wird von dem Branchenführer hergestellt und soll in über hundert Ländern eingesetzt werden.

Question: Findet das Schließsystem international Anwendung? (correct: Ja; false: Nein)

4. ID: *practice4*

Context: Tragisches Unglück in Köln-Nippes: Weil das Balkongeländer aus der Verankerung gerissen ist, ist ein Mann aus dem zweiten Stock heraus und nach unten in die Tiefe gefallen und dabei auch gestorben.

Target: Eine Nachbarin hat den Mann am Abend im Innenhof in einem Blumenbeet auf dem Boden liegend gefunden.

Question: Wurde der Mann auf dem Gehweg vor dem Haus gefunden? (correct: Nein; false: Ja)

5. ID: *practice5*

Context: Handelsübliche Festplatten halten nicht ewig. Ihre Lebenszeit ist natürlich begrenzt. Umso wichtiger ist das Sichern wertvoller Daten.

Target: Was zu beachten ist, ist, dass man sich auch professionellen Rat holt, welche Daten man keinesfalls nicht vergessen sollte.

Question: Was für eine Rat sollte man sich nicht holen? (correct: freundschaftlichen; false: professionellen)

A.3.3 Experimental items of Experiment 3

1. ID: *autor*

Context: Ein Autor hat wegen seines neuen Romans Ärger mit seinem Verlag. Er bespricht mit seinem Anwalt, ob er das Manuskript auch an anderer Stelle veröffentlichen kann.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Autor den Roman nicht an den Verlag zu schicken, unter Umständen aber an ein Internetportal.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Autor den Roman an den Verlag zu schicken, unter Umständen nicht sofort zu verbieten, um die rechtlichen Bestimmungen zu wahren.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Autor den Roman an den Verlag zu schicken, unter Umständen sofort zu verbieten, um die rechtlichen Bestimmungen zu wahren.

Question: Wer spricht mit seinem Anwalt? (correct: Der Autor; false: Der Verlag)

2. ID: *haendler*

Context: Ein Händler hat bemerkt, dass einer seiner Lehrlinge ihn bestohlen hat. Er denkt darüber nach, wie er mit der Situation umgeht.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Händler den Diebstahl nicht an die Polizei zu melden, im Nachhinein aber an die Berufsschule.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Händler den Diebstahl an die Polizei zu melden, im Nachhinein nicht ernsthaft zu erwägen, um die delikate Angelegenheit zu klären.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Händler den Diebstahl an die Polizei zu melden, im Nachhinein ernsthaft zu erwägen, um die delikate Angelegenheit zu klären.

Question: Hat der Händler den Diebstahl bereits an die Polizei gemeldet? (correct: Nein; false: Ja)

3. ID: *angestellter*

Context: Ein Angestellter ist neu in der Firma. Er lässt sich von einem Verwaltungsmitarbeiter erklären, wie Urlaubsangelegenheiten geregelt werden.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Angestellte den Urlaub nicht mit der Verwaltung zu koordinieren, im Voraus aber mit den Teammitgliedern.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Angestellte den Urlaub mit der Verwaltung zu koordinieren, im Voraus nicht unbedingt zu berücksichtigen, um die gewünschte Vorgehensweise zu befolgen.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Angestellte den Urlaub mit der Verwaltung zu koordinieren, im Voraus unbedingt zu berücksichtigen, um die gewünschte Vorgehensweise zu befolgen.

Question: Was für eine Vorgehensweise will der Angestellte befolgen? (correct: die gewünschte; false: die problemlose)

4. ID: *gaertner*

Context: Ein Gärtner wird von der Stadtverwaltung beauftragt, ein Gutachten für eine alte, kranke Kastanie abzugeben. Weil er sich unsicher ist, fragt er einen Kollegen.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Gärtner den Baum nicht in dieser Woche zu fällen, im Grunde aber vor dem Winter.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Gärtner den Baum in dieser Woche zu fällen, im Grunde nicht ausdrücklich zu empfehlen, um die alte Gartenanlage zu erhalten.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Gärtner den Baum in dieser Woche zu fällen, im Grunde ausdrücklich zu empfehlen, um die alte Gartenanlage zu erhalten.

Question: Wird ein Gutachten über eine Eiche erstellt? (correct: Nein; false: Ja)

5. ID: *pilot*

Context: Ein Pilot ist sich unsicher, ob er wegen eines drohenden Unwetters den Flugplan präventiv ändern soll oder erst in der Luft. Er holt sich Rat bei seinem Vorgesetzten.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Pilot den Flugplan nicht an das Wetter zu adaptieren, im Vornherein aber an eine Zugvogelschar.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Pilot den Flugplan an das Wetter zu adaptieren, im Vornherein nicht formal zu beantragen, um der geltenden Dienstvorschrift zu genügen.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Pilot den Flugplan an das Wetter zu adaptieren, im Vornherein formal zu beantragen, um der geltenden Dienstvorschrift zu genügen.

Question: Wen fragt der Pilot um Rat? (correct: einen Vorgesetzten; false: einen Kollegen)

6. ID: *kameramann*

Context: Ein Kameramann unterhält sich mit seinem Aufnahmeleiter über einen kurzfristigen Drehortwechsel. Am neuen Drehort herrschen nun andere Lichtverhältnisse als geplant.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Kameramann den Drehort nicht an den Fluss zu verlagern, im Grunde aber auf den Parkplatz.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Kameramann den Drehort an den Fluss zu verlagern, im Grunde nicht prinzipiell zu verweigern, um die geplanten Einstellungen zu verwirklichen.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Kameramann den Drehort an den Fluss zu verlagern, im Grunde prinzipiell zu verweigern, um die geplanten Einstellungen zu verwirklichen.

Question: Ist dem Kameramann egal wo die Szene gedreht wird? (correct: Nein; false: Ja)

7. ID: *general*

Context: Ein General ist mit der Sicherheit seines Lagers betraut. Luftangriffe sind wegen der Kosten und der Gefahren nur als letztes Mittel einzusetzen.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der General den Luftangriff nicht in die Monatsübung zu integrieren, nach Abwägung aber in die Katasrophenübung.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der General den Luftangriff in die Monatsübung zu integrieren, nach Abwägung nicht unbedingt zu befehlen, um den umfassenden Schutz zu gewährleisten.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der General den Luftangriff in die Monatsübung zu integrieren, nach Abwägung unbedingt zu befehlen, um den umfassenden Schutz zu gewährleisten.

Question: Über welche Übung denkt der General nach? (correct: die monatlich stattfindende; false: die wöchentlich stattfindende)

8. ID: *schuster*

Context: Ein Schuster bekommt öfter Stiefel, die weniger wert sind als die Reparatur. Dann bespricht er mit den Kunden, ob er die Reparatur wirklich machen soll.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Schuster den Stiefel nicht mit der Nähmaschine zu flicken, des Öfteren aber mit einem Kraftkleber.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Schuster den Stiefel mit der Nähmaschine zu flicken, des Öfteren nicht sofort zu empfehlen, um den individuellen Erwartungen zu entsprechen.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Schuster den Stiefel mit der Nähmaschine zu flicken, des Öfteren sofort zu empfehlen, um den individuellen Erwartungen zu entsprechen.

Question: Empfiehlt der Schuster immer, die Schuhe zu reparieren? (correct: Nein; false: Ja)

9. ID: *baecker*

Context: Ein Bäcker ließ heute wieder mal seinen Lehrling den Sauerteig prüfen. Kurz vor Feierabend sinnt er darüber nach den Teig selbst noch mal zu kontrollieren.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Bäcker den Sauerteig nicht in der Laboranlage zu prüfen, wohl eher aber mit einem Geruchstest.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Bäcker den Sauerteig in der Laboranlage zu prüfen, wohl eher nicht komplett zu wiederholen, um ein ruhiges Gewissen zu haben.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Bäcker den Sauerteig in der Laboranlage zu prüfen, wohl eher komplett zu wiederholen, um ein ruhiges Gewissen zu haben.

Question: Was wird in der Laboranlage geprüft? (correct: Sauerteig; false: Hefeteig)

10. ID: *polizist*

Context: Ein Polizist wird wieder zu einem Park gerufen, wo ein Obdachloser in der Nähe eines Spielplatzes herumlungert. Wie üblich versucht er, die Situation ohne Androhung von Strafen zu klären.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Polizist den Obdachlosen nicht aus dem Park zu verbannen, unter Umständen aber von dem Spielplatz.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Polizist den Obdachlosen aus dem Park zu verbannen, unter Umständen nicht unmittelbar zu erwähnen, um die alltägliche Situation zu klären.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Polizist den Obdachlosen aus dem Park zu verbannen, unter Umständen unmittelbar zu erwähnen, um die alltägliche Situation zu klären.

Question: Hält sich eine Person ohne festen Wohnsitz in der Nähe eines Spielplatzes auf? (correct: Ja; false: Nein)

11. ID: *student*

Context: Ein Student hat einen lukrativen Nebenjob. In der Prüfungsphase hat er zwar weniger Zeit, kann aber auf das Geld nur schwer verzichten.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Student den Nebenjob nicht an den Nagel zu hängen, mit Sicherheit aber im nächsten Semester.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Student den Nebenjob an den Nagel zu hängen, mit Sicherheit nicht direkt zu erwägen, um die anstrengende Prüfungsphase zu überstehen.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Student den Nebenjob an den Nagel zu hängen, mit Sicherheit direkt zu erwägen, um die anstrengende Prüfungsphase zu überstehen.

Question: Warum hat der Student weniger Zeit? (correct: wegen der Prüfungsphase; false: wegen einer Beziehung)

12. ID: *lieferant*

Context: Ein Lieferant hat einen Auftrag, bei dem die Anzahlung aussteht. Je nach Auftragslage versucht er, solche Aufträge entweder loszuwerden oder zu sichern.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Lieferant den Auftrag nicht an die Konkurrenz zu vermitteln, wohl eher aber an ein Startup.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Lieferant den Auftrag an die Konkurrenz zu vermitteln, wohl eher nicht sofort zu erwägen, um eine gleichmäßige Auslastung zu erreichen.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Lieferant den Auftrag an die Konkurrenz zu vermitteln, wohl eher sofort zu erwägen, um eine gleichmäßige Auslastung zu erreichen.

Question: Steht bei dem Auftrag noch die Anzahlung aus? (correct: Ja; false: Nein)

13. ID: *maurer*

Context: Ein Maurer wird um Rat gefragt, ob man angesichts der Temperaturen den Blitzzement verwenden soll. Dieser härtet schneller aus, ist aber auch deutlich teurer.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Maurer den Blitzzement nicht für das Fundament zu verwenden, unter Umständen aber für die Stützwände.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Maurer den Blitzzement für das Fundament zu verwenden, unter Umständen nicht uneingeschränkt zu befürworten, um den reibungslosen Ablauf zu garantieren.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Maurer den Blitzzement für das Fundament zu verwenden, unter Umständen uneingeschränkt zu befürworten, um den reibungslosen Ablauf zu garantieren.

Question: Was ist der Nachteil des Blitzzements (correct: der Preis; false: die Festigkeit)

14. ID: *mechaniker*

Context: Ein Mechaniker soll einen defekten Motor reparieren. Er ist sich unsicher, für welche Reparaturen er eine Befugnis hat und spricht mit dem Vertreter seiner Vertragsfirma.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Mechaniker den Motor nicht in alle Einzelteile zu zerlegen, am Ende aber in die Hauptbestandteile.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Mechaniker den Motor in alle Einzelteile zu zerlegen, am Ende nicht alleinig zu verantworten, um den vollen Versicherungsschutz zu wahren.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Mechaniker den Motor in alle Einzelteile zu zerlegen, am Ende alleinig zu verantworten, um den vollen Versicherungsschutz zu wahren.

Question: Repariert der Mechaniker einen Motor? (correct: Ja; false: Nein)

15. ID: *taucher*

Context: Ein Taucher hat einen Tauchgang geplant. Nachdem er den Wetterbericht studiert hat, zweifelt er, ob alle Teilnehmer den Bedingungen gewachsen sind.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Taucher den Tauchgang nicht auf den Folgetag zu verschieben, am Ende aber um zwei Stunden.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Taucher den Tauchgang auf den Folgetag zu verschieben, am Ende nicht gleich zu erwägen, um das gesundheitliche Risiko zu minimieren.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Taucher den Tauchgang auf den Folgetag zu verschieben, am Ende gleich zu erwägen, um das gesundheitliche Risiko zu minimieren.

Question: Was lässt den Taucher zweifeln, ob er den Tauchgang durchführen soll? (correct: der Wetterbericht; false: der Wasserstand)

16. ID: *priester*

Context: Ein Priester bereitet eine Taufe vor. Die Familie des Kindes will einen eigenwilligen Taufspruch verwenden. Der Priester ist unsicher, ob er die Familie umstimmen soll.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Priester den Taufspruch nicht in der Gesamtheit zu ändern, mit Sicherheit aber an einigen Stellen.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Priester den Taufspruch in der Gesamtheit zu ändern, mit Sicherheit nicht ausführlich zu diskutieren, um die anstehende Taufe zu gestatten.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Priester den Taufspruch in der Gesamtheit zu ändern, mit Sicherheit ausführlich zu diskutieren, um die anstehende Taufe zu gestatten.

Question: Hat der Priester zweifel bezüglich des Namens des Kindes? (correct: Nein; false: Ja)

17. ID: *metzger*

Context: Ein Metzger hat einen Messerblock aus Holz und nicht wie üblich aus Kunststoff. Da bald eine Hygieneprüfung ansteht, informiert er sich über die aktuellen Bestimmungen.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Metzger den Messerblock nicht mit einem Kunststoffblock zu ersetzen, wohl eher aber auf lange Sicht.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Metzger den Messerblock mit einem Kunststoffblock zu ersetzen, wohl eher nicht gleich zu überlegen, um den hygienischen Bestimmungen zu genügen.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Metzger den Messerblock mit einem Kunststoffblock zu ersetzen, wohl eher gleich zu überlegen, um den hygienischen Bestimmungen zu genügen.

Question: Messerblöcke aus welchem Material sind mittlerweile üblich? (correct: aus Kunststoff; false: aus Metall)

18. ID: *tierazt*

Context: Ein Tierarzt hat das Gefühl, dass sein Warteraum zu klein ist. Aus diesem Grund gibt er eine Untersuchung in Auftrag.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Tierarzt den Warteraum nicht in der Fläche zu vergrößern, im Grunde aber um einige Sitzplätze.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Tierarzt den Warteraum in der Fläche zu vergrößern, im Grunde nicht sofort zu erstreben, um die mögliche Auslastung zu verbessern.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Tierarzt den Warteraum in der Fläche zu vergrößern, im Grunde sofort zu erstreben, um die mögliche Auslastung zu verbessern.

Question: Hat der Tierarzt Zweifel wegen der Größe seines Wartezimmers? (correct: Ja; false: Nein)

19. ID: *fremdenfuehrer*

Context: Ein Fremdenführer ist im Zweifel, ob er auf seiner Tour den Bebauungsplan der Stadt erläutern soll. Dieser ist doch eine etwas trockene Angelegenheit.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Fremdenführer den Bebauungsplan nicht in die Tour zu integrieren, unter Umständen aber in die Broschüre.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Fremdenführer den Bebauungsplan in die Tour zu integrieren, unter Umständen nicht sofort zu entscheiden, um eine verständliche Stadtgeschichte zu präsentieren.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Fremdenführer den Bebauungsplan in die Tour zu integrieren, unter Umständen sofort zu entscheiden, um eine verständliche Stadtgeschichte zu präsentieren.

Question: Was überlegte der Fremdenführer zu erläutern? (correct: den Bebauungsplan; false: den Bebauungsfortschritt)

20. ID: *tuersteher*

Context: Ein Türsteher soll mit seinem Team regelmäßig den Parkplatz des Geländes kontrollieren. Im Moment steht wieder ein Rundgang an, jedoch ist am Eingang ein großes Gedränge.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Türsteher den Parkplatz nicht mit vielen Kollegen zu kontrollieren, dieses Mal aber mit einem Wachhund.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Türsteher den Parkplatz mit vielen Kollegen zu kontrollieren, dieses Mal nicht direkt zu genehmigen, um die allgemeine Sicherheit zu garantieren.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Türsteher den Parkplatz mit vielen Kollegen zu kontrollieren, dieses Mal direkt zu genehmigen, um die allgemeine Sicherheit zu garantieren.

Question: Will der Türsteher den Innenhof kontrollieren? (correct: Nein; false: Ja)

21. ID: *architekt*

Context: Ein Architekt trifft sich mit den Investoren eines Großprojekts. Er ist sich nicht sicher, ob er den Bauplan noch einmal überarbeiten wird und ob er das vor den Investoren geheim halten soll.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Architekt den Bauplan nicht mit großer Sorgfalt zu überarbeiten, unter Umständen aber an einigen Stellen.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Architekt den Bauplan mit großer Sorgfalt zu überarbeiten, unter Umständen nicht direkt zu erwähnen, um die kritischen Investoren zu überzeugen.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Architekt den Bauplan mit großer Sorgfalt zu überarbeiten, unter Umständen direkt zu erwähnen, um die kritischen Investoren zu überzeugen.

Question: Mit wem trifft sich der Architekt? (correct: mit Investoren; false: mit Ingenieuren)

22. ID: *hausmeister*

Context: Ein Hausmeister wird beauftragt, den Luftfilter der Klimaanlage zu wechseln. Er ruft vorsichtshalber beim Hersteller an, um Fragen zur Garantie zu klären.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Hausmeister den Luftfilter nicht auf eigene Rechnung zu wechseln, am Ende aber innerhalb der Garantie.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Hausmeister den Luftfilter auf eigene Rechnung zu wechseln, am Ende nicht einfach zu akzeptieren, um die rechtlichen Garantieansprüche zu wahren.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Hausmeister den Luftfilter auf eigene Rechnung zu wechseln, am Ende einfach zu akzeptieren, um die rechtlichen Garantieansprüche zu wahren.

Question: Versucht der Hausmeister die Garantieansprüche zu klären? (correct: Ja; false: Nein)

23. ID: *schauspieler*

Context: Ein Schauspieler spricht mit einem Theaterregisseur. Sie diskutieren, ob man den Bühnenvorhang am Ende des Stückes einsetzen sollte.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Schauspieler den Vorhang nicht auf die Bühne zu senken, im Grunde aber unter die Scheinwerfer.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Schauspieler den Vorhang auf die Bühne zu senken, im Grunde nicht ausdrücklich zu fordern, um ein gelungenes Finale zu inszenieren.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Schauspieler den Vorhang auf die Bühne zu senken, im Grunde ausdrücklich zu fordern, um ein gelungenes Finale zu inszenieren.

Question: Was soll für das Finale eingesetzt werden? (correct: ein Vorhang; false: ein Scheinwerfer)

24. ID: *taenzer*

Context: Ein Tänzer hat sich eine Woche vor einem Auftritt eine leichte Fußverletzung zugezogen. Er spricht mit seinem Arzt, um herauszufinden, ob er mit dem Veranstalter über eine Absage sprechen muss.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Tänzer den Auftritt nicht ohne einen Ersatztermin zu streichen, im Grunde aber frühestens nächsten Monat.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Tänzer den Auftritt ohne einen Ersatztermin zu streichen, im Grunde nicht sofort zu diskutieren, um das kleinere Übel zu wählen.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Tänzer den Auftritt ohne einen Ersatztermin zu streichen, im Grunde sofort zu diskutieren, um das kleinere Übel zu wählen.

Question: Hat sich der Tänzer am Fuß verletzt? (correct: Ja; false: Nein)

25. ID: *koch*

Context: Ein Koch wird zu einem Streit seiner Küchenjungen gerufen. Einer möchte den Gefrierschrank laut Hygieneplan entfrosten und reinigen. Der andere meint, dass heute zu viel zu tun sei.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Koch den Reiningungsprozess nicht auf die Tagesliste zu setzen, nach Abwägung aber auf die Wochenliste.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Koch den Reiningungsprozess auf die Tagesliste zu setzen, nach Abwägung nicht unbedingt zu untersagen, um die fälligen Aufgaben zu erledigen.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Koch den Reiningungsprozess auf die Tagesliste zu setzen, nach Abwägung unbedingt zu untersagen, um die fälligen Aufgaben zu erledigen.

Question: Was möchte einer der Küchenjungen mit dem Gefrierschrank machen? (correct: säubern; false: verkaufen)

26. ID: *friseur*

Context: Ein Friseur übt mit seinem Lehrling das Kurzhaarschneiden. Grundsätzlich ist es einfacher, den Haarschneider zu verwenden.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Friseur den Haarschneider nicht in die Hand zu nehmen, im Grunde aber dafür der Lehrling.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Friseur den Haarschneider in die Hand zu nehmen, im Grunde nicht direkt zu empfehlen, um ein gelungenes Ergebnis zu erreichen.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Friseur den Haarschneider in die Hand zu nehmen, im Grunde direkt zu empfehlen, um ein gelungenes Ergebnis zu erreichen.

Question: Übt der Lehrling heute eine Färbemethode? (correct: Nein; false: Ja)

27. ID: *elektriker*

Context: Ein Elektriker wird in ein verwahrlostes Haus zur Inspektion gerufen. Er ist im Zwiespalt, ob er der Familie den Anschluss sperren oder nur die Gefahrenstellen ausbessern soll.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Elektriker den Anschluss nicht in allen Einzelheiten zu prüfen, unter Umständen aber zumindest die Sicherungen.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Elektriker den Anschluss in allen Einzelheiten zu prüfen, unter Umständen nicht sofort zu verantworten, um eine gewissenhafte Entscheidung zu treffen.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Elektriker den Anschluss in allen Einzelheiten zu prüfen, unter Umständen sofort zu verantworten, um eine gewissenhafte Entscheidung zu treffen.

Question: Was tut der Elektriker mit dem Anschluss? (correct: prüfen; false: beantragen)

28. ID: *gaphiker*

Context: Ein Graphiker soll für den Kunden ein Muster erstellen. Der Farbverlauf wird üblicherweise korrigiert. Manchmal führt das bei unfertigen Arbeiten jedoch zu seltsamen Ergebnissen.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Graphiker den Farbverlauf nicht auf die Schnelle zu überarbeiten, dieses Mal aber mit großer Sorgfalt.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Graphiker den Farbverlauf auf die Schnelle zu überarbeiten, dieses Mal nicht gleich zu erzwingen, um ein präsentables Muster zu erzeugen.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Graphiker den Farbverlauf auf die Schnelle zu überarbeiten, dieses Mal gleich zu erzwingen, um ein präsentables Muster zu erzeugen.

Question: Sind die Farben das Problem bei der Mustererstellung? (correct: Ja; false: Nein)

29. ID: *journalist*

Context: Ein Journalist hat einen Artikel über die enge Verflechtung von Regierung und Wirtschaft verfasst. Er ist sich aber unsicher, welche Folgen dieser Artikel haben könnte.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Journalist den Artikel nicht in der Printausgabe zu veröffentlichen, unter Umständen aber auf der Internetplattform.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Journalist den Artikel in der Printausgabe zu veröffentlichen, unter Umständen nicht sofort zu riskieren, um ein politisches Umdenken zu erwirken.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Journalist den Artikel in der Printausgabe zu veröffentlichen, unter Umständen sofort zu riskieren, um ein politisches Umdenken zu erwirken.

Question: Mit wem ist die Regierung verflochten? (correct: mit der Wirtschaft; false: mit der Mafia)

30. ID: *postbote*

Context: Ein Postbote wird von einer jungen Frau gefragt, ob er einen Brief für Frau Schneider habe. Da er die Frau nicht persönlich kennt, ist er sich unsicher, ob er ihr den Brief aushändigen soll.

Target: ±NPI, LOW.NEG
Letztlich braucht/beschließt der Postbote den Brief nicht an die Frau zu übergeben, am Ende aber an eine Nachbarin.

Target: ±NPI, HIGH.NEG
Letztlich braucht/beschließt der Postbote den Brief an die Frau zu übergeben, am Ende nicht direkt zu wagen, um seine berufliche Pflicht zu erfüllen.

Target: ±NPI, NO.NEG
Letztlich braucht/beschließt der Postbote den Brief an die Frau zu übergeben, am Ende direkt zu wagen, um seine berufliche Pflicht zu erfüllen.

Question: Kennt der Postbote die Junge Frau persönlich? (correct: Nein; false: Ja)

31. ID: *winzer*

Context: Ein Winzer ist im Zwiespalt, ob er den Preis für seinen Wein erhöhen soll. Zwar sind die Kosten gestiegen, aber er fürchtet, dann weniger zu verkaufen.

Target: ±NPI, LOW.NEG
Letztendlich braucht/beschließt der Winzer den Preis nicht um drei Prozent zu erhöhen, gerade jetzt aber um ein Prozent.

Target: ±NPI, HIGH.NEG
Letztendlich braucht/beschließt der Winzer den Preis um drei Prozent zu erhöhen, gerade jetzt nicht wirklich zu erwägen, um die gestiegenen Kosten zu decken.

Target: ±NPI, NO.NEG
Letztendlich braucht/beschließt der Winzer den Preis um drei Prozent zu erhöhen, gerade jetzt wirklich zu erwägen, um die gestiegenen Kosten zu decken.

Question: Was überlegt der Winzer zu erhöhen? (correct: den Preis; false: die Produktionsmenge)

32. ID: *apotheker*

Context: Ein Apotheker wird von der Polizei gefragt, ob etwas aus seinem Giftbestand fehlt. Der Apotheker zögert, den Bestand tatsächlich zu überprüfen, da der Ruf der Apotheke leiden könnte.

Target: ±NPI, LOW.NEG
Schlussendlich braucht/beschließt der Apotheker den Giftbestand nicht auf der Stelle zu überprüfen, wohl eher aber aufgrund einer Anordnung.

Target: ±NPI, HIGH.NEG
Schlussendlich braucht/beschließt der Apotheker den Giftbestand auf der Stelle zu überprüfen, wohl eher nicht sofort zu unterstützen, um die ehrwürdige Apotheke zu schützen.

Target: ±NPI, NO.NEG
Schlussendlich braucht/beschließt der Apotheker den Giftbestand auf der Stelle zu überprüfen, wohl eher sofort zu unterstützen, um die ehrwürdige Apotheke zu schützen.

Question: Soll der Giftbestand der Apotheke überprüft werden? (correct: Ja; false: Nein)

A.3.4 Experimental items of Experiment 4

1. ID: *bauarbeiter*

Context: Ein Bauarbeiter hat den Arbeitgeber gewechselt. Hier müssen nun die Fahrzeuge jeden Abend in die engen Garagen geparkt werden.

Target: PARTICLE
Logischerweise beabsichtigt der Bauarbeiter den Lastwagen in die Garage zu navigieren am Anfang erst zu lernen, damit das teure Fahrzeug heil bleibt.

Target: BARE
Logischerweise muss der Bauarbeiter den Lastwagen in die Garage zu navigieren am Anfang erst lernen, damit das teure Fahrzeug heil bleibt.

Question: Von welchem Fahrzeug war hier die Rede?
(correct: von einem Laster; false: von einem Bagger)

2. ID: *postbote*

Context: Im Preiskampf der Paketdienste sind die Lohnkosten der Zusteller der größte Faktor. Das Personal steht zunehmend unter Leistungsdruck.

Target: PARTICLE
Deshalb probiert der Postbote die Pakete in die Verteilstationen zu bringen am Vortag genau zu planen, damit der ganze Ablauf reibungslos verläuft.

Target: BARE
Deshalb soll der Postbote die Pakete in die Verteilstationen zu bringen am Vortag genau planen, damit der ganze Ablauf reibungslos verläuft.

Question: Wird der Ablauf bereits in der Vorwoche geplant?
(correct: Nein; false: Ja)

3. ID: *lotse*

Context: Wenn große Schiffe durch enge Gewässer fahren, werden oftmals ortskundige Lotsen dazugeholt. Die Hauptverantwortung liegt nun beim Lotsen.

Target: PARTICLE
Letztlich gedenkt der Lotse den Frachter in die Schleuse zu steuern im Ernstfall auch zu verbieten, um eine drohende Havarie noch abzuwenden.

Target: BARE
Letztlich darf der Lotse den Frachter in die Schleuse zu steuern im Ernstfall auch verbieten, um eine drohende Havarie noch abzuwenden.

Question: Welches Manöver wurde angesprochen?
(correct: eine Schleuseneinfahrt; false: ein Hafenausfahrt)

4. ID: *chirurg*

Context: Um die Gedankensteuerung für eine Handprothese zu ermöglichen, ist eine Operation am offenen Gehirn nötig.

Target: PARTICLE
Sicherlich plant der Chirurg den Steuerchip in die Hirnrinde zu implantieren im Regelfall erst zu simulieren, weil die medizinischen Risiken enorm sind.

Target: BARE
Sicherlich möchte der Chirurg den Steuerchip in die Hirnrinde zu implantieren im Regelfall erst simulieren, weil die medizinischen Risiken enorm sind.

Question: Muss der Steuerchip in die Hirnrinde eingesetzt werden?
(correct: Ja; false: Nein)

5. ID: *general*

Context: Obwohl die UN-Truppen eigentlich nur Aufgaben der Friedenssicherung übernehemen sollen, steigen derzeit Kampfflugzeuge auf.

Target: Particle
Wahrscheinlich intendiert der General den Konvoi mit der Luftwaffe zu beschießen dieses Mal nur zu fingieren, damit die mutmaßliche Waffenlieferung abgesagt wird.

Target: Bare
Wahrscheinlich lässt der General den Konvoi mit der Luftwaffe zu beschießen dieses Mal nur fingieren, damit die mutmaßliche Waffenlieferung abgesagt wird.

Question: Was soll durch den Einsatz verhindert werden?
(correct: eine Waffenlieferung; false: ein Befreiungsaktion)

6. ID: *architekt*

Context: Der Architekt wird während der Bauphase immer wieder mit Änderungswünschen des Bauherren konfrontiert. Er muss diese dann mit den Bauarbeitern in die laufende Planung einbauen.

Target: Particle
Üblicherweise versucht der Architekt die Änderungen in den Wochenplan zu integrieren im Allgemeinen erst zu besprechen, damit die geplanten Vorhaben letztlich harmonieren.

Target: Bare
Üblicherweise kommt der Architekt die Änderungen in den Wochenplan zu integrieren im Allgemeinen erst besprechen, damit die geplanten Vorhaben letztlich harmonieren.

Question: Konfrontiert der Architekt die Bauherren mit Änderungsvorschlägen?
(correct: Nein; false: Ja)

7. ID: *baecker*

Context: Heute abend werden die alten Backwaren von einer sozialen Einrichtung abgeholt. Der Lehrling weiß aber leider nicht davon und bereitet die Entsorgung vor.

Target: Particle
Allerdings verlangt der Bäcker die Brötchen in den Müll zu werfen am Ende noch zu verhindern, damit die wertvollen Lebensmittel Verwendung finden.

Target: Bare
Allerdings kann der Bäcker die Brötchen in den Müll zu werfen am Ende noch verhindern, damit die wertvollen Lebensmittel Verwendung finden.

Question: Wer wollte die Brötchen wegschmeißen?
(correct: der Lehrling; false: der Verkäufer)

8. ID: *richter*

Context: Bei der Bewertung des Strafmaßes spielt die Reue eines Täters eine erhebliche Rolle.

Target: Particle
Häufig verpflichtet der Richter den Angeklagten an die Geschädigten zu schreiben im Normalfall erst zu versprechen, wenn ein öffentliches Interesse ausgelöst wurde.

Target: Bare
Häufig sieht der Richter den Angeklagten an die Geschädigten zu schreiben im Normalfall erst versprechen, wenn ein öffentliches Interesse ausgelöst wurde.

Question: Hat die Reuebekundung einen Einfluss auf das Strafmaß?
(correct: Ja; false: Nein)

A.4 Instructions and materials from Experiment 5 (self-paced reading task)

A.4.1 Instructions

Herzlich willkommen,

in diesem Experiment sollst du Sätze so schnell und genau wie möglich lesen und anschließend dazu Fragen beantworten.

Für jedes Thema siehst du nacheinander:

1. einen Kontext, als Textblock
2. ein Fixationskreuz
3. einen Satz, Wort(gruppe) fü Wort(gruppe)
4. und eine Frage mit 2 Antwortmöglichkeiten

Mit der Leertaste geht es jeweils weiter.

Wichtig ist, aufmerksam zu lesen: Die Fragen können sich sowohl auf den Kontext, als auch auf den Satz beziehen.

Die Antwortmöglichkeiten erscheinen jeweils links und rechts auf dem Bildschirm. Die linke Antwort wählst du mit der 'd'-Taste und die rechte mit der 'k'-Taste.

Deine Aufgabe ist es:

1. die Sätze so schnell wie möglich zu lesen und

2. die Fragen so schnell wie möglich und korrekt zu beantworten

Um schnellstmöglich reagieren zu können, lass bitte deine Finger auf den Tasten liegen, damit du nicht erst zur Tastatur greifen musst.

Du wirst nun erstmal ein paar Übungssätze bekommen, um dich an den Ablauf zu gewöhnen.

Während des Experiments werden dir 2 Pausen angeboten, die du selbst mit der Leertaste beenden kannst.

Wenn du jetzt eine Frage hast, kannst du dich an den Versuchsleiter wenden.
Ansonsten beginnt jetzt die Übung.

– *practice phase* –

Das soll als Übung genügen.

Wenn du noch Fragen hast, dann wende dich jetzt an den Versuchsleiter.

Falls du keine Fragen hast, dann sag dem Versuchsleiter Bescheid und beginne mit dem Experiment.

A.4.2 Practice items

1. ID: *practice1*

Context: Alle kleinen Schweinchen gehen am Sonntag ins Schwimmbad. Alle außer Willy.

Target: Willy/muss/alleine/zu Hause/bleiben.

Question: Muss Willy zuhause bleiben? (correct: Ja; false: Nein)

2. ID: *practice2*

Context: Besonders deprimiert sind viele Südafrikaner jedoch über das Ausmaß der Korruption an der Spitze der Polizei.

Target: Und dass/auch/die allermeisten Morde/im Land/ungelöst/bleiben.

Question: Wer ist deprimiert wegen der Korruption? (correct: Südafrikaner; false: Polizisten)

3. ID: *practice3*

Context: Henry wird die Schmach nicht los, dass ihn ein Mädchen besiegt hat, das kleiner und jünger ist.

Target: Auch wenn/er/nicht/der sportlichste/ist,/so/ist/er/darüber/doch/sehr betrübt.

Question: Ist Henry sehr sportlich? (correct: Nein; false: Ja)

4. ID: *practice4*

Context: In der Küche war es wieder ganz schön voll. Alle standen irgendwo herum.

Target: Lediglich einige/hatten/sich/verhältnismäßig weit/an den Rand/gestellt.

Question: Was war ganz schön voll? (correct: Küche; false: Esszimmer)

5. ID: *practice5*

Context: Der Politiker weiß, dass es schon spät ist. Trotzdem wird er nochmal rausgehen.

Target: Alle,/die/den Minister/kennen,/wissen,/dass er,/der/er/ist,/eben/so ist,/wie/er/ist.

Question: Will der Minister zuhause bleiben? (correct: Nein; false: Ja)

6. ID: *practice6*

Context: Nach dem Überfall auf einen Juwelier am Hamburger Jungfernstieg hat die Polizei am Montag die zwei Fluchtfahrzeuge der Räuber gefunden.

Target: Wie/die Polizei/am Dienstag/bestätigte,/waren/die Motorroller/nur wenige Meter/vom Tatort/entfernt/an den Statuen/entdeckt/worden.

Question: Womit flüchteten die Täter? (correct: mit Motorrollern; false: mit einem Sportwagen)

A.4.3 Experimental items

1. ID: *bauer*

Context: Die Landwirtschaft ist in besonderem Maße vom Wetter abhängig.

Target: Experiencer: V2–SO
Offenbar frustrierte der heftige Hagel damals den emsigen Bauern ziemlich, obwohl die Ernte schon eingeholt worden war.

Target: Experiencer: V2–OS
Offenbar frustrierte den emsigen Bauern damals der heftige Hagel ziemlich, obwohl die Ernte schon eingeholt worden war.

Target: Experiencer: Vfinal–SO
Offenbar hat der heftige Hagel damals den emsigen Bauern ziemlich frustriert, obwohl die Ernte schon eingeholt worden war.

Target: Experiencer: Vfinal–OS
Offenbar hat den emsigen Bauern damals der heftige Hagel ziemlich frustriert, obwohl die Ernte schon eingeholt worden war.

Target: Non-Experiencer: V2–SO
Offenbar behinderte der heftige Hagel gestern den emsigen Bauern ziemlich, obwohl der Traktor als unwettersicher angepriesen wurde.

Target: Non-Experiencer: V2–OS
Offenbar behinderte den emsigen Bauern gestern der heftige Hagel ziemlich, obwohl der Traktor als unwettersicher angepriesen wurde.

Target: Non-Experiencer: Vfinal–SO
Offenbar hat der heftige Hagel gestern den emsigen Bauern ziemlich behindert, obwohl der Traktor als unwettersicher angepriesen wurde.

Target: Non-Experiencer: Vfinal–OS
Offenbar hat den emsigen Bauern gestern der heftige Hagel ziemlich behindert, obwohl der Traktor als unwettersicher angepriesen wurde.

Question: Welche Intensität hatte der Hagel in der Geschichte? (correct: heftig; false: verheerend)

2. ID: *vater*

Context: Schutzkleidung für Fahrradfahrer ist Familien besonders wichtig.

Target: Experiencer: V2–SO
Anscheinend verblüffte der neue Helm vorhin den störrischen Vater sehr, weil das Gewicht so enorm niedrig war.

Target: Experiencer: V2–OS
Anscheinend verblüffte den störrischen Vater vorhin der neue Helm sehr, weil das Gewicht so enorm niedrig war.

Target: Experiencer: Vfinal–SO
Anscheinend hat der neue Helm vorhin den störrischen Vater sehr verblüfft, weil das Gewicht so enorm niedrig war.

Target: Experiencer: Vfinal–OS
Anscheinend hat den störrischen Vater vorhin der neue Helm sehr verblüfft, weil das Gewicht so enorm niedrig war.

Target: Non-Experiencer: V2–SO
Anscheinend schützte der neue Helm vorhin den störrischen Vater gut, weil das Ding sonst im Müll gelandet wäre.

Target: Non-Experiencer: V2–OS
Anscheinend schützte den störrischen Vater vorhin der neue Helm gut, weil das Ding sonst im Müll gelandet wäre.

Target: Non-Experiencer: Vfinal–SO
Anscheinend hat der neue Helm vorhin den störrischen Vater gut geschützt, weil das Ding sonst im Müll gelandet wäre.

Target: Non-Experiencer: Vfinal–OS
Anscheinend hat den störrischen Vater vorhin der neue Helm gut geschützt, weil das Ding sonst im Müll gelandet wäre.

Question: Ist es wahr, dass Familien die Fahrradausrüstung egal ist? (correct: Nein; false: Ja)

3. ID: *waerter*

Context: Übergriffe in Gefängnissen sind selten und müssen vom Personal genau untersucht werden.

Target: Experiencer: V2–SO
Anscheinend erstaunte der gewalttätige Aufstand letztens den erfahrenen Wärter kaum, trotz der Ruhe in den letzten Jahren.

Target: Experiencer: V2–OS
Anscheinend erstaunte den erfahrenen Wärter letztens der gewalttätige Aufstand kaum, trotz der Ruhe in den letzten Jahren.

Target: Experiencer: Vfinal–SO
Anscheinend hat der gewalttätige Aufstand letztens den erfahrenen Wärter kaum erstaunt, trotz der Ruhe in den letzten Jahren.

Target: Experiencer: Vfinal–OS
Anscheinend hat den erfahrenen Wärter letztens der gewalttätige Aufstand kaum erstaunt, trotz der Ruhe in den letzten Jahren.

Target: Non-Experiencer: V2–SO
Anscheinend weckte der gewalttätige Aufstand letztens den erfahrenen Wärter kaum, trotz des Geschreis in allen Teilen des Hauses.

Target: Non-Experiencer: V2–OS
Anscheinend weckte den erfahrenen Wärter letztens der gewalttätige Aufstand kaum, trotz des Geschreis in allen Teilen des Hauses.

Target: Non-Experiencer: Vfinal–SO
Anscheinend hat der gewalttätige Aufstand letztens den erfahrenen Wärter kaum geweckt, trotz des Geschreis in allen Teilen des Hauses.

Target: Non-Experiencer: Vfinal–OS
Anscheinend hat den erfahrenen Wärter letztens der gewalttätige Aufstand kaum geweckt, trotz des Geschreis in allen Teilen des Hauses.

Question: Wer muss die Vorfälle untersuchen? (correct: das Gefängnispersonal; false: der Gefängnisdirektor)

4. ID: *gast*

Context: Erfahrene Barleute wissen, dass eine kleine Änderung des Rezepts einen enormen Effekt auf die Kunden haben kann.

Target: Experiencer: V2–SO
Tatsächlich ekelte der exotische Cocktail vorhin den ahnungslosen Gast ziemlich, obwohl die Zutaten im Grunde seinem Geschmack entsprachen.

Target: Experiencer: V2–OS
Tatsächlich ekelte den ahnungslosen Gast vorhin der exotische Cocktail ziemlich, obwohl die Zutaten im Grunde seinem Geschmack entsprachen.

Target: Experiencer: Vfinal–SO
Tatsächlich hat der exotische Cocktail vorhin den ahnungslosen Gast ziemlich geekelt, obwohl die Zutaten im Grunde seinem Geschmack entsprachen.

Target: Experiencer: Vfinal–OS
Tatsächlich hat den ahnungslosen Gast vorhin der exotische Cocktail ziemlich geekelt, obwohl die Zutaten im Grunde seinem Geschmack entsprachen.

Target: Non-Experiencer: V2–SO
Tatsächlich vergiftete der exotische Cocktail vorhin den ahnungslosen Gast fast, obwohl die Mischung früher gut bekömmlich war.

Target: Non-Experiencer: V2–OS
Tatsächlich vergiftete den ahnungslosen Gast vorhin der exotische Cocktail fast, obwohl die Mischung früher gut bekömmlich war.

Target: Non-Experiencer: Vfinal–SO
Tatsächlich hat der exotische Cocktail vorhin den ahnungslosen Gast fast vergiftet, obwohl die Mischung früher gut bekömmlich war.

Target: Non-Experiencer: Vfinal–OS
Tatsächlich hat den ahnungslosen Gast vorhin der exotische Cocktail fast vergiftet, obwohl die Mischung früher gut bekömmlich war.

Question: War der Cocktail dieses Mal gut bekömmlich? (correct: Nein; false: Ja)

5. ID: *schueler*

Context: Erfahrene Lehrer wissen, wie sie mit einfachen Mitteln angespannte Prüfungssituationen in der Klasse entschärfen können.

Target: Experiencer: V2–SO
Zum Glück ermutigte der gute Hinweis vorhin den jungen Schüler wieder, da die Note sonst deutlich schlechter ausgefallen wäre.

Target: Experiencer: V2–OS
Zum Glück ermutigte den jungen Schüler vorhin der gute Hinweis wieder, da die Note sonst deutlich schlechter ausgefallen wäre.

Target: Experiencer: Vfinal–SO
Zum Glück hat der gute Hinweis vorhin den jungen Schüler wieder ermutigt, da die Note sonst deutlich schlechter ausgefallen wäre.

Target: Experiencer: Vfinal–OS
Zum Glück hat den jungen Schüler vorhin der gute Hinweis wieder ermutigt, da die Note sonst deutlich schlechter ausgefallen wäre.

Target: Non-Experiencer: V2–SO
Zum Glück verbesserte der gute Hinweis vorhin den jungen Schüler noch, da die Note sonst deutlich schlechter ausgefallen wäre.

Target: Non-Experiencer: V2–OS
Zum Glück verbesserte den jungen Schüler vorhin der gute Hinweis noch, da die Note sonst deutlich schlechter ausgefallen wäre.

Target: Non-Experiencer: Vfinal–SO
Zum Glück hat der gute Hinweis vorhin den jungen Schüler noch verbessert, da die Note sonst deutlich schlechter ausgefallen wäre.

Target: Non-Experiencer: Vfinal–OS
Zum Glück hat den jungen Schüler vorhin der gute Hinweis noch verbessert, da die Note sonst deutlich schlechter ausgefallen wäre.

Question: Was hat dem Schüler geholfen? (correct: ein Hinweis; false: eine Übung)

6. ID: *baenker*

Context: Wichtige Transaktionen können mit dem Einzug der Computer in das Bankenwesen inzwischen mit nur einem Knopfdruck durch die Mitarbeiter erfolgen.

Target: Experiencer: V2–SO
Sicherlich schockierte der plötzliche Verkauf damals den unerfahrenen Bänker ziemlich, auch wenn die Folgen eigentlich erwartbar waren.

Target: Experiencer: V2–OS
Sicherlich schockierte den unerfahrenen Bänker damals der plötzliche Verkauf ziemlich, auch wenn die Folgen eigentlich erwartbar waren.

Target: Experiencer: Vfinal–SO
Sicherlich hat der plötzliche Verkauf damals den unerfahrenen Bänker ziemlich schockiert, auch wenn die Folgen eigentlich erwartbar waren.

Target: Experiencer: Vfinal–OS
Sicherlich hat den unerfahrenen Bänker damals der plötzliche Verkauf ziemlich schockiert, auch wenn die Folgen eigentlich erwartbar waren.

Target: Non-Experiencer: V2–SO
Sicherlich rettete der plötzliche Verkauf damals den unerfahrenen Bänker rechtzeitig, auch wenn die Folgen eigentlich unverdient waren.

Target: Non-Experiencer: V2–OS
Sicherlich rettete den unerfahrenen Bänker damals der plötzliche Verkauf rechtzeitig, auch wenn die Folgen eigentlich unverdient waren.

Target: Non-Experiencer: Vfinal–SO
Sicherlich hat der plötzliche Verkauf damals den unerfahrenen Bänker rechtzeitig gerettet, auch wenn die Folgen eigentlich unverdient waren.

Target: Non-Experiencer: Vfinal–OS
Sicherlich hat den unerfahrenen Bänker damals der plötzliche Verkauf rechtzeitig gerettet, auch wenn die Folgen eigentlich unverdient waren.

Question: Hat der Bänker ein Finanzprodukt angekauft? (correct: Nein; false: Ja)

7. ID: *wachmann*

Context: Es ist allgemein bekannt, dass Notsignale nicht leichtfertig gebraucht werden sollten, damit das Personal sie im Ernstfall nicht ignoriert.

Target: Experiencer: V2–SO
Bestimmt störte der wiederholte Alarm vorhin den müden Wachmann besonders, zumal die Sirene schon mehrmals ohne Grund losging.

Target: Experiencer: V2–OS
Bestimmt störte den müden Wachmann vorhin der wiederholte Alarm besonders, zumal die Sirene schon mehrmals ohne Grund losging.

Target: Experiencer: Vfinal–SO
Bestimmt hat der wiederholte Alarm vorhin den müden Wachmann besonders gestört, zumal die Sirene schon mehrmals ohne Grund losging.

Target: Experiencer: Vfinal–OS
Bestimmt hat den müden Wachmann vorhin der wiederholte Alarm besonders gestört, zumal die Sirene schon mehrmals ohne Grund losging.

Target: Non-Experiencer: V2–SO
Bestimmt warnte der wiederholte Alarm vorhin den müden Wachmann trotzdem, zumal ein Notfall nie ausgeschlossen werden kann.

Target: Non-Experiencer: V2–OS
Bestimmt warnte den müden Wachmann vorhin der wiederholte Alarm trotzdem, zumal ein Notfall nie ausgeschlossen werden kann.

Target: Non-Experiencer: Vfinal–SO
Bestimmt hat der wiederholte Alarm vorhin den müden Wachmann trotzdem gewarnt, zumal ein Notfall nie ausgeschlossen werden kann.

Target: Non-Experiencer: Vfinal–OS
Bestimmt hat den müden Wachmann vorhin der wiederholte Alarm trotzdem gewarnt, zumal ein Notfall nie ausgeschlossen werden kann.

Question: Was ist das Problem bei Notsignalen? (correct: leichtfertiger Gebrauch; false: veraltete Technik)

8. ID: *stuermer*

Context: Wenn die elektrischen Einrichtungen in Fußballstadien nicht regelmäßig überprüft und in Stand gehalten werden, können sie die Spieler stören.

Target: Experiencer: V2–SO
Anscheinend beunruhigte der leuchtstarke Scheinwerfer gestern den erfolgreichen Stürmer ziemlich, weil das Gehäuse erheblich herumwackelte.

Target: Experiencer: V2–OS
Anscheinend beunruhigte den erfolgreichen Stürmer gestern der leuchtstarke Scheinwerfer ziemlich, weil das Gehäuse erheblich herumwackelte.

Target: Experiencer: Vfinal–SO
Anscheinend hat der leuchtstarke Scheinwerfer gestern den erfolgreichen Stürmer ziemlich beunruhigt, weil das Gehäuse erheblich herumwackelte.

Target: Experiencer: Vfinal–OS
Anscheinend hat den erfolgreichen Stürmer gestern der leuchtstarke Scheinwerfer ziemlich beunruhigt, weil das Gehäuse erheblich herumwackelte.

Target: Non-Experiencer: V2–SO
Anscheinend blendete der leuchtstarke Scheinwerfer gestern den erfolgreichen Stürmer ziemlich, weil der Lichtstrahl ihn direkt ins Gesicht traf.

Target: Non-Experiencer: V2–OS
Anscheinend blendete den erfolgreichen Stürmer gestern der leuchtstarke Scheinwerfer ziemlich, weil der Lichtstrahl ihn direkt ins Gesicht traf.

Target: Non-Experiencer: Vfinal–SO
Anscheinend hat der leuchtstarke Scheinwerfer gestern den erfolgreichen Stürmer ziemlich geblendet, weil der Lichtstrahl ihn direkt ins Gesicht traf.

Target: Non-Experiencer: Vfinal–OS
Anscheinend hat den erfolgreichen Stürmer gestern der leuchtstarke Scheinwerfer ziemlich geblendet, weil der Lichtstrahl ihn direkt ins Gesicht traf.

Question: War der Stürmer gestört durch den Scheinwerfer? (correct: Ja; false: Nein)

9. ID: *fahrer*

Context: Offenbar hat ein Zufall einen schweren Unfall für alle Beteiligten noch verhindern können.

Target: Experiencer: V2–SO
Wahrscheinlich verwunderte der nächtliche Anruf vorhin den müden Fahrer sehr, sodass der Fahrer auf den Standstreifen fahren musste.

Target: Experiencer: V2–OS
Wahrscheinlich verwunderte den müden Fahrer vorhin der nächtliche Anruf sehr, sodass der Fahrer auf den Standstreifen fahren musste.

Target: Experiencer: Vfinal–SO
Wahrscheinlich hat der nächtliche Anruf vorhin den müden Fahrer sehr verwundert, sodass der Fahrer auf den Standstreifen fahren musste.

Target: Experiencer: Vfinal–OS
Wahrscheinlich hat den müden Fahrer vorhin der nächtliche Anruf sehr verwundert, sodass der Fahrer auf den Standstreifen fahren musste.

Target: Non-Experiencer: V2–SO
Wahrscheinlich stoppte der nächtliche Anruf vorhin den müden Fahrer sofort, sodass der Fahrer auf den Standstreifen fahren musste.

Target: Non-Experiencer: V2–OS
Wahrscheinlich stoppte den müden Fahrer vorhin der nächtliche Anruf sofort, sodass der Fahrer auf den Standstreifen fahren musste.

Target: Non-Experiencer: Vfinal–SO
Wahrscheinlich hat der nächtliche Anruf vorhin den müden Fahrer sofort gestoppt, sodass der Fahrer auf den Standstreifen fahren musste.

Target: Non-Experiencer: Vfinal–OS
Wahrscheinlich hat den müden Fahrer vorhin der nächtliche Anruf sofort gestoppt, sodass der Fahrer auf den Standstreifen fahren musste.

Question: Was hat den Fahrer zum Anhalten gebracht? (correct: ein nächtlicher Anruf; false: ein schlechter Traum)

10. ID: *baecker*

Context: Wirtschaftliche Krisen durchziehen schnell alle wirtschaftliche Bereiche.

Target: Experiencer: V2–SO
Tatsächlich deprimierte der geringe Umsatz damals den fleißigen Bäcker sehr, obwohl die Krise fast alle Händler betraf.

Target: Experiencer: V2–OS
Tatsächlich deprimierte den fleißigen Bäcker damals der geringe Umsatz sehr, obwohl die Krise fast alle Händler betraf.

Target: Experiencer: Vfinal–SO
Tatsächlich hat der geringe Umsatz damals den fleißigen Bäcker sehr deprimiert, obwohl die Krise fast alle Händler betraf.

Target: Experiencer: Vfinal–OS
Tatsächlich hat den fleißigen Bäcker damals der geringe Umsatz sehr deprimiert, obwohl die Krise fast alle Händler betraf.

Target: Non-Experiencer: V2–SO
Tatsächlich ruinierte der geringe Umsatz damals den fleißigen Bäcker fast, obwohl das Geschäft bis dahin sehr gut lief.

Target: Non-Experiencer: V2–OS
Tatsächlich ruinierte den fleißigen Bäcker damals der geringe Umsatz fast, obwohl das Geschäft bis dahin sehr gut lief.

Target: Non-Experiencer: Vfinal–SO
Tatsächlich hat der geringe Umsatz damals den fleißigen Bäcker fast ruiniert, obwohl das Geschäft bis dahin sehr gut lief.

Target: Non-Experiencer: Vfinal–OS
Tatsächlich hat den fleißigen Bäcker damals der geringe Umsatz fast ruiniert, obwohl das Geschäft bis dahin sehr gut lief.

Question: Betraf die Finanzkrise nur die Banken? (correct: Nein; false: Ja)

11. ID: *unternehmer*

Context: Die Folgen von Unwettern können Investoren schwerwiegende finanzielle Einbußen bescheren.

Target: Experiencer: V2–SO
Tatsächlich verärgerte der massive Schaden gestern den mittellosen Unternehmer besonders, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Target: Experiencer: V2–OS
Tatsächlich verärgerte den mittellosen Unternehmer gestern der massive Schaden besonders, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Target: Experiencer: Vfinal–SO
Tatsächlich hat der massive Schaden gestern den mittellosen Unternehmer besonders verärgert, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Target: Experiencer: Vfinal–OS
Tatsächlich hat den mittellosen Unternehmer gestern der massive Schaden besonders verärgert, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Target: Non-Experiencer: V2–SO
Tatsächlich benachteiligte der massive Schaden gestern den mittellosen Unternehmer ziemlich, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Target: Non-Experiencer: V2–OS
Tatsächlich benachteiligte den mittellosen Unternehmer gestern der massive Schaden ziemlich, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Target: Non-Experiencer: Vfinal–SO
Tatsächlich hat der massive Schaden gestern den mittellosen Unternehmer ziemlich benachteiligt, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Target: Non-Experiencer: Vfinal–OS
Tatsächlich hat den mittellosen Unternehmer gestern der massive Schaden ziemlich benachteiligt, obwohl die Auswirkungen zuerst kaum zu sehen waren.

Question: Was können Unwetterfolgen bewirken? (correct: finanzielle Einbußen; false: finanziellen Aufschwung)

12. ID: *kuenstler*

Context: In der Filmbranche braucht man gut vernetzte Manager, die die unterschiedlichen Interessengemeinschaften zusammenbringen können.

Target: Experiencer: V2–SO
Zum Glück interessierte der ungewöhnliche Auftrag damals den polnischen Künstler unmittelbar, zumal die Gage ausgesprochen üppig war.

Target: Experiencer: V2–OS
Zum Glück interessierte den polnischen Künstler damals der ungewöhnliche Auftrag unmittelbar, zumal die Gage ausgesprochen üppig war.

Target: Experiencer: Vfinal–SO
Zum Glück hat der ungewöhnliche Auftrag damals den polnischen Künstler unmittelbar interessiert, zumal die Gage ausgesprochen üppig war.

Target: Experiencer: Vfinal–OS
Zum Glück hat den polnischen Künstler damals der ungewöhnliche Auftrag unmittelbar interessiert, zumal die Gage ausgesprochen üppig war.

Target: Non-Experiencer: V2–SO
Zum Glück ernährte der ungewöhnliche Auftrag damals den polnischen Künstler unmittelbar, zumal die Gage ausgesprochen üppig war.

Target: Non-Experiencer: V2–OS
Zum Glück ernährte den polnischen Künstler damals der ungewöhnliche Auftrag unmittelbar, zumal die Gage ausgesprochen üppig war.

Target: Non-Experiencer: Vfinal–SO
Zum Glück hat der ungewöhnliche Auftrag damals den polnischen Künstler unmittelbar ernährt, zumal die Gage ausgesprochen üppig war.

Target: Non-Experiencer: Vfinal–OS
Zum Glück hat den polnischen Künstler damals der ungewöhnliche Auftrag unmittelbar ernährt, zumal die Gage ausgesprochen üppig war.

Question: Ist der Künstler aus Italien? (correct: Nein; false: Ja)

13. ID: *geiger*

Context: Kulturkritiken sind heikel, weil man weder vorhersehen kann, ob die Kritik positiv ausfällt, noch wie die Kritik von den Künstlern aufgenommen wird.

Target: Experiencer: V2–SO
Anscheinend erfreute der ausführliche Artikel neulich den berühmten Geiger besonders, auch wenn der Beitrag durchaus kritisch war.

Target: Experiencer: V2–OS
Anscheinend erfreute den berühmten Geiger neulich der ausführliche Artikel besonders, auch wenn der Beitrag durchaus kritisch war.

Target: Experiencer: Vfinal–SO
Anscheinend hat der ausführliche Artikel neulich den berühmten Geiger besonders erfreut, auch wenn der Beitrag durchaus kritisch war.

Target: Experiencer: Vfinal–OS
Anscheinend hat den berühmten Geiger neulich der ausführliche Artikel besonders erfreut, auch wenn der Beitrag durchaus kritisch war.

Target: Non-Experiencer: V2–SO
Anscheinend würdigte der ausführliche Artikel neulich den berühmten Geiger nachträglich, auch wenn der Beitrag durchaus kritisch war.

Target: Non-Experiencer: V2–OS
Anscheinend würdigte den berühmten Geiger neulich der ausführliche Artikel nachträglich, auch wenn der Beitrag durchaus kritisch war.

Target: Non-Experiencer: Vfinal–SO
Anscheinend hat der ausführliche Artikel neulich den berühmten Geiger nachträglich gewürdigt, auch wenn der Beitrag durchaus kritisch war.

Target: Non-Experiencer: Vfinal–OS
Anscheinend hat den berühmten Geiger neulich der ausführliche Artikel nachträglich gewürdigt, auch wenn der Beitrag durchaus kritisch war.

Question: Was wurde dem Musiker gewidmet? (correct: Zeitungsartikel; false: Fernsehbeitrag)

14. ID: *junge*

Context: Ehrgeizige Eltern nutzen jedes Mittel, um ihre vermeintlichen Wunderkinder zum Erfolg zu führen.

Target: Experiencer: V2–SO
Offenbar langweilte der wissenschaftliche Vortrag vorhin den begabten Jungen enorm, obwohl der Sprecher sich große Mühe gab.

Target: Experiencer: V2–OS
Offenbar langweilte den begabten Jungen vorhin der wissenschaftliche Vortrag enorm, obwohl der Sprecher sich große Mühe gab.

Target: Experiencer: Vfinal–SO
Offenbar hat der wissenschaftliche Vortrag vorhin den begabten Jungen enorm gelangweilt, obwohl der Sprecher sich große Mühe gab.

Target: Experiencer: Vfinal–OS
Offenbar hat den begabten Jungen vorhin der wissenschaftliche Vortrag enorm gelangweilt, obwohl der Sprecher sich große Mühe gab.

Target: Non-Experiencer: V2–SO
Offenbar trainierte der wissenschaftliche Vortrag vorhin den begabten Jungen gut, obwohl der Sprecher nicht sehr gut vorbereitet war.

Target: Non-Experiencer: V2–OS
Offenbar trainierte den begabten Jungen vorhin der wissenschaftliche Vortrag gut, obwohl der Sprecher nicht sehr gut vorbereitet war.

Target: Non-Experiencer: Vfinal–SO
Offenbar hat der wissenschaftliche Vortrag vorhin den begabten Jungen gut trainiert, obwohl der Sprecher nicht sehr gut vorbereitet war.

Target: Non-Experiencer: Vfinal–OS
Offenbar hat den begabten Jungen vorhin der wissenschaftliche Vortrag gut trainiert, obwohl der Sprecher nicht sehr gut vorbereitet war.

Question: Mischen sich ehrgeizige Eltern in die Ausbildung ihrer Kinder ein? (correct: Ja; false: Nein)

15. ID: *chefkoch*

Context: Der NDR berichtete in einer Sendung direkt aus der Küche eines feinen Hamburger Restaurants.

Target: Experiencer: V2–SO
Tatsächlich entzückte der fruchtige Nachtisch heute den strengen Chefkoch durchaus, obwohl die Süßspeise eine gewagte Neukreation war.

Target: Experiencer: V2–OS
Tatsächlich entzückte den strengen Chefkoch heute der fruchtige Nachtisch durchaus, obwohl die Süßspeise eine gewagte Neukreation war.

Target: Experiencer: Vfinal–SO
Tatsächlich hat der fruchtige Nachtisch heute den strengen Chefkoch durchaus entzückt, obwohl die Süßspeise eine gewagte Neukreation war.

Target: Experiencer: Vfinal–OS
Tatsächlich hat den strengen Chefkoch heute der fruchtige Nachtisch durchaus entzückt, obwohl die Süßspeise eine gewagte Neukreation war.

Target: Non-Experiencer: V2–SO
Tatsächlich repräsentierte der fruchtige Nachtisch heute den strengen Chefkoch sehr gut, obwohl die Süßspeise eine gewagte Neukreation war.

Target: Non-Experiencer: V2–OS
Tatsächlich repräsentierte den strengen Chefkoch heute der fruchtige Nachtisch sehr gut, obwohl die Süßspeise eine gewagte Neukreation war.

Target: Non-Experiencer: Vfinal–SO
Tatsächlich hat der fruchtige Nachtisch heute den strengen Chefkoch sehr gut repräsentiert, obwohl die Süßspeise eine gewagte Neukreation war.

Target: Non-Experiencer: Vfinal–OS
Tatsächlich hat den strengen Chefkoch heute der fruchtige Nachtisch sehr gut repräsentiert, obwohl die Süßspeise eine gewagte Neukreation war.

Question: Wonach schmeckte der Nachtisch? (correct: nach Frucht; false: nach Vanille)

16. ID: *pfarrer*

Context: Auch beim sonst eher konservativen Gottesdienst in der Kirche passieren noch Dinge, die die Leute überraschen.

Target: Experiencer: V2–SO
Offenbar begeisterte der flippige Gesang gestern den depressiven Pfarrer sofort, obwohl dieser Effekt von niemandem erwartet wurde.

Target: Experiencer: V2–OS
Offenbar begeisterte den depressiven Pfarrer gestern der flippige Gesang sofort, obwohl dieser Effekt von niemandem erwartet wurde.

Target: Experiencer: Vfinal–SO
Offenbar hat der flippige Gesang gestern den depressiven Pfarrer sofort begeistert, obwohl dieser Effekt von niemandem erwartet wurde.

Target: Experiencer: Vfinal–OS
Offenbar hat den depressiven Pfarrer gestern der flippige Gesang sofort begeistert, obwohl dieser Effekt von niemandem erwartet wurde.

Target: Non-Experiencer: V2–SO
Offenbar heilte der flippige Gesang gestern den depressiven Pfarrer sofort, obwohl dieser Effekt von niemandem erwartet wurde.

Target: Non-Experiencer: V2–OS
Offenbar heilte den depressiven Pfarrer gestern der flippige Gesang sofort, obwohl dieser Effekt von niemandem erwartet wurde.

Target: Non-Experiencer: Vfinal–SO
Offenbar hat der flippige Gesang gestern den depressiven Pfarrer sofort geheilt, obwohl dieser Effekt von niemandem erwartet wurde.

Target: Non-Experiencer: Vfinal–OS
Offenbar hat den depressiven Pfarrer gestern der flippige Gesang sofort geheilt, obwohl dieser Effekt von niemandem erwartet wurde.

Question: War der Pfarrer immer fröhlich? (correct: Nein; false: Ja)

17. ID: *torwart*

Context: Im Spitzenfußball kann jede Kleinigkeit die Leistung der Sportler beeinflussen.

Target: Experiencer: V2–SO
Natürlich frustrierte der unbequeme Schuh vorhin den ehrgeizigen Torwart ziemlich, obwohl die Sportler das eigentlich oft erleben.

Target: Experiencer: V2–OS
Natürlich frustrierte den ehrgeizigen Torwart vorhin der unbequeme Schuh ziemlich, obwohl die Sportler das eigentlich oft erleben.

Target: Experiencer: Vfinal–SO
Natürlich hat der unbequeme Schuh vorhin den ehrgeizigen Torwart ziemlich frustriert, obwohl die Sportler das eigentlich oft erleben.

Target: Experiencer: Vfinal–OS
Natürlich hat den ehrgeizigen Torwart vorhin der unbequeme Schuh ziemlich frustriert, obwohl die Sportler das eigentlich oft erleben.

Target: Non-Experiencer: V2–SO
Natürlich behinderte der unbequeme Schuh vorhin den ehrgeizigen Torwart ziemlich, obwohl die Sportler das eigentlich oft erleben.

Target: Non-Experiencer: V2–OS
Natürlich behinderte den ehrgeizigen Torwart vorhin der unbequeme Schuh ziemlich, obwohl die Sportler das eigentlich oft erleben.

Target: Non-Experiencer: Vfinal–SO
Natürlich hat der unbequeme Schuh vorhin den ehrgeizigen Torwart ziemlich behindert, obwohl die Sportler das eigentlich oft erleben.

Target: Non-Experiencer: Vfinal–OS
Natürlich hat den ehrgeizigen Torwart vorhin der unbequeme Schuh ziemlich behindert, obwohl die Sportler das eigentlich oft erleben.

Question: Was störte den Torwart? (correct: der Schuh; false: der Handschuh)

18. ID: *imker*

Context: Traditionelle Methoden sind immer noch das Mittel der Wahl für Leute, die mit Bienen arbeiten.

Target: Experiencer: V2–SO
Offenbar verblüffte der gewebte Mantel letztens den vorsichtigen Imker total, obwohl die Bienen ziemlich angriffslustig waren.

Target: Experiencer: V2–OS
Offenbar verblüffte den vorsichtigen Imker letztens der gewebte Mantel total, obwohl die Bienen ziemlich angriffslustig waren.

Target: Experiencer: Vfinal–SO
Offenbar hat der gewebte Mantel letztens den vorsichtigen Imker total verblüfft, obwohl die Bienen ziemlich angriffslustig waren.

Target: Experiencer: Vfinal–OS
Offenbar hat den vorsichtigen Imker letztens der gewebte Mantel total verblüfft, obwohl die Bienen ziemlich angriffslustig waren.

Target: Non-Experiencer: V2–SO
Offenbar schützte der gewebte Mantel letztens den vorsichtigen Imker genug, obwohl die Bienen ziemlich angriffslustig waren.

Target: Non-Experiencer: V2–OS
Offenbar schützte den vorsichtigen Imker letztens der gewebte Mantel genug, obwohl die Bienen ziemlich angriffslustig waren.

Target: Non-Experiencer: Vfinal–SO
Offenbar hat der gewebte Mantel letztens den vorsichtigen Imker genug geschützt, obwohl die Bienen ziemlich angriffslustig waren.

Target: Non-Experiencer: Vfinal–OS
Offenbar hat den vorsichtigen Imker letztens der gewebte Mantel genug geschützt, obwohl die Bienen ziemlich angriffslustig waren.

Question: Werden neue Methoden bevorzugt bei der Arbeit mit Bienen? (correct: Nein; false: Ja)

19. ID: *lehrling*

Context: Die schlagartigen Entladungen des Wasserdrucks sollten eigentlich kein Problem mehr darstellen für die Bewohner des Wohnheims.

Target: Experiencer: V2–SO
Vermutlich erstaunte der laute Knall heute den erschöpften Lehrling sehr, da die Reparaturen gerade abgeschlossen waren.

Target: Experiencer: V2–OS
Vermutlich erstaunte den erschöpften Lehrling heute der laute Knall sehr, da die Reparaturen gerade abgeschlossen waren.

Target: Experiencer: Vfinal–SO
Vermutlich hat der laute Knall heute den erschöpften Lehrling sehr erstaunt, da die Reparaturen gerade abgeschlossen waren.

Target: Experiencer: Vfinal–OS
Vermutlich hat den erschöpften Lehrling heute der laute Knall sehr erstaunt, da die Reparaturen gerade abgeschlossen waren.

Target: Non-Experiencer: V2–SO
Vermutlich weckte der laute Knall heute den erschöpften Lehrling sofort, da die Lautstärke viel größer war als sonst immer.

Target: Non-Experiencer: V2–OS
Vermutlich weckte den erschöpften Lehrling heute der laute Knall sofort, da die Lautstärke viel größer war als sonst immer.

Target: Non-Experiencer: Vfinal–SO
Vermutlich hat der laute Knall heute den erschöpften Lehrling sofort geweckt, da die Lautstärke viel größer war als sonst immer.

Target: Non-Experiencer: Vfinal–OS
Vermutlich hat den erschöpften Lehrling heute der laute Knall sofort geweckt, da die Lautstärke viel größer war als sonst immer.

Question: Was erzeugt der Wasserdruck im Wohnheim? (correct: einen Knall; false: ein Leck)

20. ID: *tourist*

Context: Nur weil etwas eine kulinarische Spezialität ist, ist es nicht zwingend wohlschmeckend oder gar gesundheitlich unbedenklich für Reisende.

Target: Experiencer: V2–SO
Offenbar ekelte der vergorene Fruchtsaft damals den neugierigen Touristen sehr, obwohl das Ungewohnte sonst eigentlich sein Ding ist.

Target: Experiencer: V2–OS
Offenbar ekelte den neugierigen Touristen damals der vergorene Fruchtsaft sehr, obwohl das Ungewohnte sonst eigentlich sein Ding ist.

Target: Experiencer: Vfinal–SO
Offenbar hat der vergorene Fruchtsaft damals den neugierigen Touristen sehr geekelt, obwohl das Ungewohnte sonst eigentlich sein Ding ist.

Target: Experiencer: Vfinal–OS
Offenbar hat den neugierigen Touristen damals der vergorene Fruchtsaft sehr geekelt, obwohl das Ungewohnte sonst eigentlich sein Ding ist.

Target: Non-Experiencer: V2–SO
Offenbar vergiftete der vergorene Fruchtsaft damals den neugierigen Touristen beinahe, obwohl seine Freunde keine Probleme damit hatten.

Target: Non-Experiencer: V2–OS
Offenbar vergiftete den neugierigen Touristen damals der vergorene Fruchtsaft beinahe, obwohl seine Freunde keine Probleme damit hatten.

Target: Non-Experiencer: Vfinal–SO
Offenbar hat der vergorene Fruchtsaft damals den neugierigen Touristen beinahe vergiftet, obwohl seine Freunde keine Probleme damit hatten.

Target: Non-Experiencer: Vfinal–OS
Offenbar hat den neugierigen Touristen damals der vergorene Fruchtsaft beinahe vergiftet, obwohl seine Freunde keine Probleme damit hatten.

Question: War vergorene Milch das Problem? (correct: Nein; false: Ja)

21. ID: *sportler*

Context: Erfahrene Trainer betreuen ihre Schützlinge ganzheitlich und wissen, dass man die psychische Komponente nicht unterschätzen darf.

Target: Experiencer: V2–SO
Tatsächlich ermutigte der kluge Ratschlag damals den erfolglosen Sportler besonders, auch wenn seine Blutwerte noch nicht optimal waren.

Target: Experiencer: V2–OS
Tatsächlich ermutigte den erfolglosen Sportler damals der kluge Ratschlag besonders, auch wenn seine Blutwerte noch nicht optimal waren.

Target: Experiencer: Vfinal–SO
Tatsächlich hat der kluge Ratschlag damals den erfolglosen Sportler besonders ermutigt, auch wenn seine Blutwerte noch nicht optimal waren.

Target: Experiencer: Vfinal–OS
Tatsächlich hat den erfolglosen Sportler damals der kluge Ratschlag besonders ermutigt, auch wenn seine Blutwerte noch nicht optimal waren.

Target: Non-Experiencer: V2–SO
Tatsächlich verbesserte der kluge Ratschlag gestern den erfolglosen Sportler enorm, auch wenn seine Blutwerte noch nicht optimal waren.

Target: Non-Experiencer: V2–OS
Tatsächlich verbesserte den erfolglosen Sportler gestern der kluge Ratschlag enorm, auch wenn seine Blutwerte noch nicht optimal waren.

Target: Non-Experiencer: Vfinal–SO
Tatsächlich hat der kluge Ratschlag gestern den erfolglosen Sportler enorm verbessert, auch wenn seine Blutwerte noch nicht optimal waren.

Target: Non-Experiencer: Vfinal–OS
Tatsächlich hat den erfolglosen Sportler gestern der kluge Ratschlag enorm verbessert, auch wenn seine Blutwerte noch nicht optimal waren.

Question: Was bekam der Sportler? (correct: einen klugen Ratschlag; false: einen unerfahrenen Trainer)

22. ID: *investor*

Context: In der Finanzwelt haben Geschäftsleute oft mehr Glück als Können.

Target: Experiencer: V2–SO
Wahrscheinlich schockierte der horrende Gewinn damals den glücklosen Investor trotzdem, auch wenn die Rendite nun nicht astronomisch war.

Target: Experiencer: V2–OS
Wahrscheinlich schockierte den glücklosen Investor damals der horrende Gewinn trotzdem, auch wenn die Rendite nun nicht astronomisch war.

Target: Experiencer: Vfinal–SO
Wahrscheinlich hat der horrende Gewinn damals den glücklosen Investor trotzdem schokiert, auch wenn die Rendite nun nicht astronomisch war.

Target: Experiencer: Vfinal–OS
Wahrscheinlich hat den glücklosen Investor damals der horrende Gewinn trotzdem schokiert, auch wenn die Rendite nun nicht astronomisch war.

Target: Non-Experiencer: V2–SO
Wahrscheinlich rettete der horrende Gewinn damals den glücklosen Investor trotzdem, auch wenn die Rendite anfangs nicht sehr hoch ausfiel.

Target: Non-Experiencer: V2–OS
Wahrscheinlich rettete den glücklosen Investor damals der horrende Gewinn trotzdem, auch wenn die Rendite anfangs nicht sehr hoch ausfiel.

Target: Non-Experiencer: Vfinal–SO
Wahrscheinlich hat der horrende Gewinn damals den glücklosen Investor trotzdem gerettet, auch wenn die Rendite anfangs nicht sehr hoch ausfiel.

Target: Non-Experiencer: Vfinal–OS
Wahrscheinlich hat den glücklosen Investor damals der horrende Gewinn trotzdem gerettet, auch wenn die Rendite anfangs nicht sehr hoch ausfiel.

Question: Entstehen Erfolge in der Finanzwelt oft durch Glück? (correct: Ja; false: Nein)

23. ID: *pfleger*

Context: Durch die gewohnte Umgebung haben regelmäßig auftretende Sinnesreize oft keinen Effekt mehr auf das Personal.

Target: Experiencer: V2–SO
Offenbar störte der lautstarke Notruf heute den arroganten Pfleger kaum, zumal die Schichtleitung ihn zügig ausschaltete.

Target: Experiencer: V2–OS
Offenbar störte den arroganten Pfleger heute der lautstarke Notruf kaum, zumal die Schichtleitung ihn zügig ausschaltete.

Target: Experiencer: Vfinal–SO
Offenbar hat der lautstarke Notruf heute den arroganten Pfleger kaum gestört, zumal die Schichtleitung ihn zügig ausschaltete.

Target: Experiencer: Vfinal–OS
Offenbar hat den arroganten Pfleger heute der lautstarke Notruf kaum gestört, zumal die Schichtleitung ihn zügig ausschaltete.

Target: Non-Experiencer: V2–SO
Offenbar warnte der lautstarke Notruf heute den arroganten Pfleger doch, zumal der Signalton erst vor Kurzem geändert wurde.

Target: Non-Experiencer: V2–OS
Offenbar warnte den arroganten Pfleger heute der lautstarke Notruf doch, zumal der Signalton erst vor Kurzem geändert wurde.

Target: Non-Experiencer: Vfinal–SO
Offenbar hat der lautstarke Notruf heute den arroganten Pfleger doch gewarnt, zumal der Signalton erst vor Kurzem geändert wurde.

Target: Non-Experiencer: Vfinal–OS
Offenbar hat den arroganten Pfleger heute der lautstarke Notruf doch gewarnt, zumal der Signalton erst vor Kurzem geändert wurde.

Question: Was ist das Problem bei Notsignalen? (correct: das regelmäßige Auftreten; false: die Lautstärke)

24. ID: *taucher*

Context: Bei Arbeiten unter Wasser führen kleine Unstimmigkeiten bei den Geräten schon dazu, dass das Team den Vorgang abbricht.

Target: Experiencer: V2–SO
Vermutlich beunruhigte der umgebaute Strahler vorhin den konzentrierten Taucher sehr, zumal das Licht viel zu stark war.

Target: Experiencer: V2–OS
Vermutlich beunruhigte den konzentrierten Taucher vorhin der umgebaute Strahler sehr, zumal das Licht viel zu stark war.

Target: Experiencer: Vfinal–SO
Vermutlich hat der umgebaute Strahler vorhin den konzentrierten Taucher sehr beunruhigt, zumal das Licht viel zu stark war.

Target: Experiencer: Vfinal–OS
Vermutlich hat den konzentrierten Taucher vorhin der umgebaute Strahler sehr beunruhigt, zumal das Licht viel zu stark war.

Target: Non-Experiencer: V2–SO
Vermutlich blendete der umgebaute Strahler vorhin den konzentrierten Taucher stark, zumal der Lichtstrahl genau auf ihn gerichtet war.

Target: Non-Experiencer: V2–OS
Vermutlich blendete den konzentrierten Taucher vorhin der umgebaute Strahler stark, zumal der Lichtstrahl genau auf ihn gerichtet war.

Target: Non-Experiencer: Vfinal–SO
Vermutlich hat der umgebaute Strahler vorhin den konzentrierten Taucher stark geblendet, zumal der Lichtstrahl genau auf ihn gerichtet war.

Target: Non-Experiencer: Vfinal–OS
Vermutlich hat den konzentrierten Taucher vorhin der umgebaute Strahler stark geblendet, zumal der Lichtstrahl genau auf ihn gerichtet war.

Question: Wurde der Taucher von einem Scheinwerfer irritiert? (correct: Ja; false: Nein)

25. ID: *foerster*

Context: Subtile Veränderungen im Gelände sind auffällig für Leute, die beruflich mit Landschaften zu tun haben.

Target: Experiencer: V2–SO
Offenbar verwunderte der künstliche Graben vorhin den aufmerksamen Förster besonders, zumal die Gefahr auch für Wanderer nicht unerheblich war.

Target: Experiencer: V2–OS
Offenbar verwunderte den aufmerksamen Förster vorhin der künstliche Graben besonders, zumal die Gefahr auch für Wanderer nicht unerheblich war.

Target: Experiencer: Vfinal–SO
Offenbar hat der künstliche Graben vorhin den aufmerksamen Förster besonders verwundert, zumal die Gefahr auch für Wanderer nicht unerheblich war.

Target: Experiencer: Vfinal–OS
Offenbar hat den aufmerksamen Förster vorhin der künstliche Graben besonders verwundert, zumal die Gefahr auch für Wanderer nicht unerheblich war.

Target: Non-Experiencer: V2–SO
Offenbar stoppte der künstliche Graben heute den aufmerksamen Förster gleich, zumal ein Tier offenbar verletzt darin lag.

Target: Non-Experiencer: V2–OS
Offenbar stoppte den aufmerksamen Förster heute der künstliche Graben gleich, zumal ein Tier offenbar verletzt darin lag.

Target: Non-Experiencer: Vfinal–SO
Offenbar hat der künstliche Graben heute den aufmerksamen Förster gleich gestoppt, zumal ein Tier offenbar verletzt darin lag.

Target: Non-Experiencer: Vfinal–OS
Offenbar hat den aufmerksamen Förster heute der künstliche Graben gleich gestoppt, zumal ein Tier offenbar verletzt darin lag.

Question: Was war besonders an dem Graben? (correct: Er war künstlich.; false: Er war sehr tief.)

26. ID: *gaertner*

Context: Die Natur und ihre Tücken lassen sich auch für Experten nur schwer kontrollieren.

Target: Experiencer: V2–SO
Natürlich deprimierte der gefräßige Schädling damals den fleißigen Gärtner ziemlich, weil die Jungpflanzen vollständig vernichtet worden waren.

Target: Experiencer: V2–OS
Natürlich deprimierte den fleißigen Gärtner damals der gefräßige Schädling ziemlich, weil die Jungpflanzen vollständig vernichtet worden waren.

Target: Experiencer: Vfinal–SO
Natürlich hat der gefräßige Schädling damals den fleißigen Gärtner ziemlich deprimiert, weil die Jungpflanzen vollständig vernichtet worden waren.

Target: Experiencer: Vfinal–OS
Natürlich hat den fleißigen Gärtner damals der gefräßige Schädling ziemlich deprimiert, weil die Jungpflanzen vollständig vernichtet worden waren.

Target: Non-Experiencer: V2–SO
Natürlich ruinierte der gefräßige Schädling damals den fleißigen Gärtner sofort, weil die Jungpflanzen vollständig vernichtet worden waren.

Target: Non-Experiencer: V2–OS
Natürlich ruinierte den fleißigen Gärtner damals der gefräßige Schädling sofort, weil die Jungpflanzen vollständig vernichtet worden waren.

Target: Non-Experiencer: Vfinal–SO
Natürlich hat der gefräßige Schädling damals den fleißigen Gärtner sofort ruiniert, weil die Jungpflanzen vollständig vernichtet worden waren.

Target: Non-Experiencer: Vfinal–OS
Natürlich hat den fleißigen Gärtner damals der gefräßige Schädling sofort ruiniert, weil die Jungpflanzen vollständig vernichtet worden waren.

Question: Können Experten alle Schäden verhindern? (correct: Nein; false: Ja)

27. ID: *laeufer*

Context: Auch die raffiniertesten Hilfsmittel bleiben bei angeschlagenen Sportlern nicht ohne Folgen.

Target: Experiencer: V2–SO
Anscheinend verärgerte der medizinische Knieschützer vorhin den unerfahrenen Läufer ziemlich, obwohl die Bandage extra für ihn angefertigt worden war.

Target: Experiencer: V2–OS
Anscheinend verärgerte den unerfahrenen Läufer vorhin der medizinische Knieschützer ziemlich, obwohl die Bandage extra für ihn angefertigt worden war.

Target: Experiencer: Vfinal–SO
Anscheinend hat der medizinische Knieschützer vorhin den unerfahrenen Läufer ziemlich verärgert, obwohl die Bandage extra für ihn angefertigt worden war.

Target: Experiencer: Vfinal–OS
Anscheinend hat den unerfahrenen Läufer vorhin der medizinische Knieschützer ziemlich verärgert, obwohl die Bandage extra für ihn angefertigt worden war.

Target: Non-Experiencer: V2–SO
Anscheinend benachteiligte der medizinische Knieschützer damals den unerfahrenen Läufer stark, obwohl die Bandage extra für ihn angefertigt worden war.

Target: Non-Experiencer: V2–OS
Anscheinend benachteiligte den unerfahrenen Läufer damals der medizinische Knieschützer stark, obwohl die Bandage extra für ihn angefertigt worden war.

Target: Non-Experiencer: Vfinal–SO
Anscheinend hat der medizinische Knieschützer damals den unerfahrenen Läufer stark benachteiligt, obwohl die Bandage extra für ihn angefertigt worden war.

Target: Non-Experiencer: Vfinal–OS
Anscheinend hat den unerfahrenen Läufer damals der medizinische Knieschützer stark benachteiligt, obwohl die Bandage extra für ihn angefertigt worden war.

Question: Was nutzen angeschlagene Sportler oft? (correct: raffinierte Hilfsmittel; false: teure Therapien)

28. ID: *landwirt*

Context: Auch scheinbar unbrauchbare Landschaften wurden von Gutsbesitzern oft geschätzt.

Target: Experiencer: V2–SO
Tatsächlich interessierte der abgelegene Acker früher den geizigen Landwirt besonders, weil der Ertrag den Lebensunterhalt sicherte.

Target: Experiencer: V2–OS
Tatsächlich interessierte den geizigen Landwirt früher der abgelegene Acker besonders, weil der Ertrag den Lebensunterhalt sicherte.

Target: Experiencer: Vfinal–SO
Tatsächlich hat der abgelegene Acker früher den geizigen Landwirt besonders interessiert, weil der Ertrag den Lebensunterhalt sicherte.

Target: Experiencer: Vfinal–OS
Tatsächlich hat den geizigen Landwirt früher der abgelegene Acker besonders interessiert, weil der Ertrag den Lebensunterhalt sicherte.

Target: Non-Experiencer: V2–SO
Tatsächlich ernährte der abgelegene Acker früher den geizigen Landwirt ausreichend, weil der Ertrag im Vergleich enorm hoch war.

Target: Non-Experiencer: V2–OS
Tatsächlich ernährte den geizigen Landwirt früher der abgelegene Acker ausreichend, weil der Ertrag im Vergleich enorm hoch war.

Target: Non-Experiencer: Vfinal–SO
Tatsächlich hat der abgelegene Acker früher den geizigen Landwirt ausreichend ernährt, weil der Ertrag im Vergleich enorm hoch war.

Target: Non-Experiencer: Vfinal–OS
Tatsächlich hat den geizigen Landwirt früher der abgelegene Acker ausreichend ernährt, weil der Ertrag im Vergleich enorm hoch war.

Question: Lagen wichtige Felder zum Teil auch weitab der Höfe? (correct: Ja; false: Nein)

29. ID: *trainer*

Context: Die Wertschätzung der Auszeichnungen nimmt im Laufe der Sportlerkarriere selten ab.

Target: Experiencer: V2–SO
Selbstverständlich erfreute der vergoldete Pokal gestern den berühmten Trainer sehr, auch wenn das Preisgeld eher bescheiden war.

Target: Experiencer: V2–OS
Selbstverständlich erfreute den berühmten Trainer gestern der vergoldete Pokal sehr, auch wenn das Preisgeld eher bescheiden war.

Target: Experiencer: Vfinal–SO
Selbstverständlich hat der vergoldete Pokal gestern den berühmten Trainer sehr erfreut, auch wenn das Preisgeld eher bescheiden war.

Target: Experiencer: Vfinal–OS
Selbstverständlich hat den berühmten Trainer gestern der vergoldete Pokal sehr erfreut, auch wenn das Preisgeld eher bescheiden war.

Target: Non-Experiencer: V2–SO
Selbstverständlich würdigte der vergoldete Pokal gestern den berühmten Trainer ausreichend, auch wenn seine Blütezeit schon vorbei war.

Target: Non-Experiencer: V2–OS
Selbstverständlich würdigte den berühmten Trainer gestern der vergoldete Pokal ausreichend, auch wenn seine Blütezeit schon vorbei war.

Target: Non-Experiencer: Vfinal–SO
Selbstverständlich hat der vergoldete Pokal gestern den berühmten Trainer ausreichend gewürdigt, auch wenn seine Blütezeit schon vorbei war.

Target: Non-Experiencer: Vfinal–OS
Selbstverständlich hat den berühmten Trainer gestern der vergoldete Pokal ausreichend gewürdigt, auch wenn seine Blütezeit schon vorbei war.

Question: Welche Auszeichnung bekam der Trainer? (correct: einen vergoldeten Pokal; false: einen Preis für sein Lebenswerk)

30. ID: *boxer*

Context: Vorbereitungen auf Titelkämpfe sind langwierig und fordern die Sportler noch einmal besonders.

Target: Experiencer: V2–SO
Vermutlich langweilte der finale Testkampf gestern den routinierten Boxer ziemlich, obwohl das Niveau ziemlich anspruchsvoll war.

Target: Experiencer: V2–OS
Vermutlich langweilte den routinierten Boxer gestern der finale Testkampf ziemlich, obwohl das Niveau ziemlich anspruchsvoll war.

Target: Experiencer: Vfinal–SO
Vermutlich hat der finale Testkampf gestern den routinierten Boxer ziemlich gelangweilt, obwohl das Niveau ziemlich anspruchsvoll war.

Target: Experiencer: Vfinal–OS
Vermutlich hat den routinierten Boxer gestern der finale Testkampf ziemlich gelangweilt, obwohl das Niveau ziemlich anspruchsvoll war.

Target: Non-Experiencer: V2–SO
Vermutlich trainierte der finale Testkampf gestern den routinierten Boxer ausreichend, obwohl das Niveau ziemlich niedrig war.

Target: Non-Experiencer: V2–OS
Vermutlich trainierte den routinierten Boxer gestern der finale Testkampf ausreichend, obwohl das Niveau ziemlich niedrig war.

Target: Non-Experiencer: Vfinal–SO
Vermutlich hat der finale Testkampf gestern den routinierten Boxer ausreichend trainiert, obwohl das Niveau ziemlich niedrig war.

Target: Non-Experiencer: Vfinal–OS
Vermutlich hat den routinierten Boxer gestern der finale Testkampf ausreichend trainiert, obwohl das Niveau ziemlich niedrig war.

Question: Sind die Wettkampfvorbereitungen sehr aufwändig? (correct: Ja; false: Nein)

31. ID: *prinz*

Context: Öffentliche Veranstaltungen gehören zu den wichtigen Verpflichtungen der Adligen, auch wenn diese oft unbeliebt sind.

Target: Experiencer: V2–SO
Im Prinzip entzückte der effektvolle Auftritt letztens den jungen Prinzen sofort, zumal der Tronfolger ein bekennender Ballettfan ist.

Target: Experiencer: V2–OS
Im Prinzip entzückte den jungen Prinzen letztens der effektvolle Auftritt sofort, zumal der Tronfolger ein bekennender Ballettfan ist.

Target: Experiencer: Vfinal–SO
Im Prinzip hat der effektvolle Auftritt letztens den jungen Prinzen sofort entzückt, zumal der Tronfolger ein bekennender Ballettfan ist.

Target: Experiencer: Vfinal–OS
Im Prinzip hat den jungen Prinzen letztens der effektvolle Auftritt sofort entzückt, zumal der Tronfolger ein bekennender Ballettfan ist.

Target: Non-Experiencer: V2–SO
Im Prinzip repräsentierte der effektvolle Auftritt letztens den jungen Prinzen perfekt, zumal die Veranstaltung einem strikten Protokoll folgt.

Target: Non-Experiencer: V2–OS
Im Prinzip repräsentierte den jungen Prinzen letztens der effektvolle Auftritt perfekt, zumal die Veranstaltung einem strikten Protokoll folgt.

Target: Non-Experiencer: Vfinal–SO
Im Prinzip hat der effektvolle Auftritt letztens den jungen Prinzen perfekt repräsentiert, zumal die Veranstaltung einem strikten Protokoll folgt.

Target: Non-Experiencer: Vfinal–OS
Im Prinzip hat den jungen Prinzen letztens der effektvolle Auftritt perfekt repräsentiert, zumal die Veranstaltung einem strikten Protokoll folgt.

Question: Was ist das Problem mit öffentlichen Veranstaltungen? (correct: Sie sind oft unbeliebt.; false: Sie finden oft im Winter statt.)

32. ID: *saenger*

Context: Natürliche Medizin aus regionaler Produktion überzeugt selbst Stars, die sich alles leisten könnten.

Target: Experiencer: V2–SO
Sicherlich begeistere der wohlschmeckende Honig vorhin den angeschlagenen Sänger sofort, zumal die Wirkung beinahe augenblicklich eintrat.

Target: Experiencer: V2–OS
Sicherlich begeistere den angeschlagenen Sänger vorhin der wohlschmeckende Honig sofort, zumal die Wirkung beinahe augenblicklich eintrat.

Target: Experiencer: Vfinal–SO
Sicherlich hat der wohlschmeckende Honig vorhin den angeschlagenen Sänger sofort begeistert, zumal die Wirkung beinahe augenblicklich eintrat.

Target: Experiencer: Vfinal–OS
Sicherlich hat den angeschlagenen Sänger vorhin der wohlschmeckende Honig sofort begeistert, zumal die Wirkung beinahe augenblicklich eintrat.

Target: Non-Experiencer: V2–SO
Sicherlich heilte der wohlschmeckende Honig vorhin den angeschlagenen Sänger sofort, zumal die Einnahme ohne jede Nebenwirkung bleibt.

Target: Non-Experiencer: V2–OS
Sicherlich heilte den angeschlagenen Sänger vorhin der wohlschmeckende Honig sofort, zumal die Einnahme ohne jede Nebenwirkung bleibt.

Target: Non-Experiencer: Vfinal–SO
Sicherlich hat der wohlschmeckende Honig vorhin den angeschlagenen Sänger sofort geheilt, zumal die Einnahme ohne jede Nebenwirkung bleibt.

Target: Non-Experiencer: Vfinal–OS
Sicherlich hat den angeschlagenen Sänger vorhin der wohlschmeckende Honig sofort geheilt, zumal die Einnahme ohne jede Nebenwirkung bleibt.

Question: Stimmt es, dass der Honig unangenehm schmeckte? (correct: Nein; false: Ja)

A.4.4 Agentive controls

1. ID: *zahnarzt*

Context: Die Ahndung von medizinischen Behandlungsfehlern erfordert die Kooperation der Mitarbeiter sowie klare Nachweise.

Target: V2–SO
Vermutlich zerstörte der kluge Zahnarzt damals den einzigen Beweis sofort, damit die Untersuchungen erfolglos verlaufen würden.

Target: Vfinal–SO
Vermutlich hat der kluge Zahnarzt damals den einzigen Beweis sofort zerstört, damit die Untersuchungen erfolglos verlaufen würden.

Question: Was hat der Zahnarzt vermutlich gemacht? (correct: Beweise vernichtet; false: Menschen absichtlich geschadet)

2. ID: *Weber*

Context: Mitarbeiter sollen die Maschinen bei empfindlichen Materialien nur zu zweit bedienen.

Target: V2–SO
Anscheinend bedruckte der fleißige Weber vorhin den weißen Nylonstoff alleine, obwohl die Vorschriften dies ausdrücklich verbieten.

Target: Vfinal–SO
Anscheinend hat der fleißige Weber vorhin den weißen Nylonstoff alleine bedruckt, obwohl die Vorschriften dies ausdrücklich verbieten.

Question: Welche Eigenschaft wurde dem Weber zugeschrieben? (correct: fleißig (sein); false: unvorsichtig (sein))

3. ID: *forscher*

Context: Das wissenschaftliche Personal wird für die Arbeit mit stabilen Sonderanfertigungen ausgerüstet, um gute Messungen zu ermöglichen.

Target: V2–SO
Wahrscheinlich zerbrach der interessierte Forscher gestern den kleinen Spiegel absichtlich, um zu sehen, wann das Material kaputt geht.

Target: Vfinal–SO
Wahrscheinlich hat der interessierte Forscher gestern den kleinen Spiegel absichtlich zerbrochen, um zu sehen, wann das Material kaputt geht.

Question: Welche Eigenschaft haben wissenschaftliche Materialien? (correct: stabil (sein); false: gefährlich (sein))

4. ID: *jaeger*

Context: Die Zuständigen für jeden Waldabschnitt kümmern sich auch um unberechtigt parkende Fahrzeuge.

Target: V2–SO
Offenbar versteckte der strenge Jäger gestern den roten Roller irgendwo, damit dem Halter dadurch ein Schrecken eingejagt wird.

Target: Vfinal–SO
Offenbar hat der strenge Jäger gestern den roten Roller irgendwo versteckt, damit dem Halter dadurch ein Schrecken eingejagt wird.

Question: Wo stand der Roller? (correct: auf dem Waldparkplatz; false: auf dem Rastplatz)

5. ID: *frisoer*

Context: Viele Selbstständige versuchen erst einmal mit entbehrlichen Gegenständen Geld zu machen, um die ersten Monate gut zu überstehen.

Target: V2–SO
Bestimmt verkaufte der tüchtige Frisör neulich den braunen Sessel einfach, damit die Einbußen kompensiert werden können.

Target: Vfinal–SO
Bestimmt hat der tüchtige Frisör neulich den braunen Sessel einfach verkauft, damit die Einbußen kompensiert werden können.

Question: Ist der Frisör faul? (correct: Nein; false: Ja)

6. ID: *makler*

Context: Immobilienverkäufer achten besonders auf die Inneneinrichtung und korrigieren ihre Entscheidungen gerne mehrmals.

Target: V2–SO
Tatsächlich zerteilte der akribische Makler nachts den riesigen Vorhang nochmal, weil der Saum doch noch den Boden berührte.

Target: Vfinal–SO
Tatsächlich hat der akribische Makler nachts den riesigen Vorhang nochmal zerteilt, weil der Saum doch noch den Boden berührte.

Question: Hat der Makler den Vorhang verändert? (correct: Ja; false: Nein)

7. ID: *maler*

Context: Die Arbeiter auf der Baustelle leiden oft darunter, dass zu wenig Material für die anstehenden Arbeiten vorhanden ist.

Target: V2–SO
Deswegen zerriss der dicke Maler heute den alten Lappen kurzerhand, damit die Lehrlinge beide etwas zum Abwischen hatten.

Target: Vfinal–SO
Deswegen hat der dicke Maler heute den alten Lappen kurzerhand zerrissen, damit die Lehrlinge beide etwas zum Abwischen hatten.

Question: Haben die Bauarbeiter zu wenig Material? (correct: Ja; false: Nein)

8. ID: *neffe*

Context: Den Familienmitgliedern ist bekannt, dass sie Ärger bekommen, wenn sie bei strömendem Regen mit ihren nassen Klamotten das Haus betreten.

Target: V2–SO
Hoffentlich versteckte der schlaue Neffe morgens den nassen Rucksack wenigstens, damit die Tante nicht böse wird.

Target: Vfinal–SO
Hoffentlich hat der schlaue Neffe morgens den nassen Rucksack wenigstens versteckt, damit die Tante nicht böse wird.

Question: Hat der Junge eine Sporttasche versteckt? (correct: Nein; false: Ja)

A.4.5 Configurational controls

1. ID: *schleier*

Context: Bei ihrem Besuch der italienischen Provinzmetropole besichtigten die Studenten natürlich auch die große Kirche. Aber so etwas hatten sie nicht erwartet.

Target: V2–SO
Überraschenderweise bedeckte ein großer Schleier damals den schönen Altar vollständig, obwohl die Kirche doch zur Besichtigung geöffnet worden war.

Target: V2–OS
Überraschenderweise bedeckte den schönen Altar damals ein großer Schleier vollständig, obwohl die Kirche doch zur Besichtigung geöffnet worden war.

Target: Vfinal–SO
Überraschenderweise hat ein großer Schleier damals den schönen Altar vollständig bedeckt, obwohl die Kirche doch zur Besichtigung geöffnet worden war.

Target: Vfinal–OS
Überraschenderweise hat den schönen Altar damals ein großer Schleier vollständig bedeckt, obwohl die Kirche doch zur Besichtigung geöffnet worden war.

Question: In welchem Land waren die Studenten unterwegs? (correct: Italien; false: Frankreich)

2. ID: *ueberzug*

Context: Die Ermittler der Polizei erreichten als letztes den Tatort, nachdem die Spurensicherung und die Gerichtsmedizin schon lange da waren.

Target: V2–SO
Dort umhüllte ein weißer Überzug mittlerweile den toten Körper gänzlich, weil die Tote wohl sehr stark entstellt worden war.

Target: V2–OS
Dort umhüllte den toten Körper mittlerweile ein weißer Überzug gänzlich, weil die Tote wohl sehr stark entstellt worden war.

Target: Vfinal–SO
Dort hat ein weißer Überzug mittlerweile den toten Körper gänzlich umhüllt, weil die Tote wohl sehr stark entstellt worden war.

Target: Vfinal–OS
Dort hat den toten Körper mittlerweile ein weißer Überzug gänzlich umhüllt, weil die Tote wohl sehr stark entstellt worden war.

Question: War der Leichnam nur teilweise abgedeckt? (correct: Nein; false: Ja)

3. ID: *pudding*

Context: Bei der Gesellenprüfung zum Bäcker muss auch mindestens ein Süßgebäck zubereitet werden. Irgendetwas glitzerte auf dem Backblech.

Target: V2–SO
Scheinbar überzog ein süßer Pudding inzwischen den hellen Kuchen komplett, auch wenn dieser Aufwand eigentlich nicht notwendig gewesen wäre.

Target: V2–OS
Scheinbar überzog den hellen Kuchen inzwischen ein süßer Pudding komplett, auch wenn dieser Aufwand eigentlich nicht notwendig gewesen wäre.

Target: Vfinal–SO
Scheinbar hat ein süßer Pudding inzwischen den hellen Kuchen komplett überzogen, auch wenn dieser Aufwand eigentlich nicht notwendig gewesen wäre.

Target: Vfinal–OS
Scheinbar hat den hellen Kuchen inzwischen ein süßer Pudding komplett überzogen, auch wenn dieser Aufwand eigentlich nicht notwendig gewesen wäre.

Question: Was bedeckte den Kuchen? (correct: Pudding; false: Zuckerguss)

4. ID: *pfosten*

Context: Der Schlossgarten besteht aus verschiedenen Abschnitten, die an einigen Stellen miteinander verbunden sind. Routen mit verschiedenen Farben führen durch diese Bereiche.

Target: V2–SO
Glücklicherweise markierte ein blauer Pfosten hier den schmalen Gehweg deutlich, damit die Besucher ihren Weg finden können.

Target: V2–OS
Glücklicherweise markierte den schmalen Gehweg hier ein blauer Pfosten deutlich, damit die Besucher ihren Weg finden können.

Target: Vfinal–SO
Glücklicherweise hat ein blauer Pfosten hier den schmalen Gehweg deutlich markiert, damit die Besucher ihren Weg finden können.

Target: Vfinal–OS
Glücklicherweise hat den schmalen Gehweg hier ein blauer Pfosten deutlich markiert, damit die Besucher ihren Weg finden können.

Question: Besteht der Schlossgarten aus mehreren Bereichen? (correct: Ja; false: Nein)

5. ID: *kasten*

Context: Im Kunstunterricht sollen die Schüler das städtische Rathaus zeichnen, nachdem sie zehn Minuten Zeit hatten sich das Bild einzuprägen. Erfahrungsgemäß werden einige Details von allen übersehen.

Target: V2–SO
Tatsächlich schmückte ein bunter Kasten hier den kleinen Balkon zusätzlich, wenngleich die Figuren natürlich eher in Erinnerung bleiben.

Target: V2–OS
Tatsächlich schmückte den kleinen Balkon hier ein bunter Kasten zusätzlich, wenngleich die Figuren natürlich eher in Erinnerung bleiben.

Target: Vfinal–SO
Tatsächlich hat ein bunter Kasten hier den kleinen Balkon zusätzlich geschmückt, wenngleich die Figuren natürlich eher in Erinnerung bleiben.

Target: Vfinal–OS
Tatsächlich hat den kleinen Balkon hier ein bunter Kasten zusätzlich geschmückt, wenngleich die Figuren natürlich eher in Erinnerung bleiben.

Question: Was sollten die Schüler zeichnen? (correct: das städtische Rathaus; false: das städtische Aquarium)

6. ID: *schutzwall*

Context: Die Archäologen untersuchen die auffälligen Steinformationen in der Nähe des alten Klosters. Etwas war hier besonders.

Target: V2–SO
Offenbar umgab ein hoher Schutzwall damals den weiten Acker vollständig, damit die Ernte in unruhigen Zeiten verteidigt werden konnte.

Target: V2–OS
Offenbar umgab den weiten Acker damals ein hoher Schutzwall vollständig, damit die Ernte in unruhigen Zeiten verteidigt werden konnte.

Target: Vfinal–SO
Offenbar hat ein hoher Schutzwall damals den weiten Acker vollständig umgeben, damit die Ernte in unruhigen Zeiten verteidigt werden konnte.

Target: Vfinal–OS
Offenbar hat den weiten Acker damals ein hoher Schutzwall vollständig umgeben, damit die Ernte in unruhigen Zeiten verteidigt werden konnte.

Question: Umgab der Schutzwall nur den Marktplatz? (correct: Nein; false: Ja)

7. ID: *holzzaun*

Context: Laura erinnert sich noch gut an das Gartenhäuschen ihrer Großeltern. Die Erinnerung an die Umgebung außerhalb des Häuschens ist aber kaum vorhanden.

Target: V2–SO
Bestimmt begrenzte ein alter Holzzaun damals den schönen Garten vollständig, weil die Großeltern doch eher traditionell waren.

Target: V2–OS
Bestimmt begrenzte den schönen Garten damals ein alter Holzzaun vollständig, weil die Großeltern doch eher traditionell waren.

Target: Vfinal–SO
Bestimmt hat ein alter Holzzaun damals den schönen Garten vollständig begrenzt, weil die Großeltern doch eher traditionell waren.

Target: Vfinal–OS
Bestimmt hat den schönen Garten damals ein alter Holzzaun vollständig begrenzt, weil die Großeltern doch eher traditionell waren.

Question: Was hat den Garten begrenzt? (correct: ein alter Holzzaun; false: ein grüner Maschendrahtzaun)

8. ID: *bogen*

Context: Die Historiker spekulieren bis heute über die Details der Fassade. Über die Jahre haben sich aber einige Vorstellungen verfestigt.

Target: V2–SO
Sicherlich verzierte ein schmaler Bogen dort den breiten Eingang dezent, wenngleich die Gewissheit nur durch ein Foto gegeben werden kann.

Target: V2–OS
Sicherlich verzierte den breiten Eingang dort ein schmaler Bogen dezent, wenngleich die Gewissheit nur durch ein Foto gegeben werden kann.

Target: Vfinal–SO
Sicherlich hat ein schmaler Bogen dort den breiten Eingang dezent verziert, wenngleich die Gewissheit nur durch ein Foto gegeben werden kann.

Target: Vfinal–OS
Sicherlich hat den breiten Eingang dort ein schmaler Bogen dezent verziert, wenngleich die Gewissheit nur durch ein Foto gegeben werden kann.

Question: Verziert ein Holzrahmen den Eingang? (correct: Nein; false: Ja)

A.5 Information about the L2-participants

ID	group		sex	age	L1s	L2s	self assesment L2 German (1-6)				duration of L2 German			stay in DE
	L1	profic.					listening	reading	speaking	writing	total	school	university	
A01	JNU	low	male	19	Hindi	English, German, Dutch	5	4	3	3	2	no	2	no
A02	JNU	low	female	23	Ladakhi	English, Hindi, Arabic, Urdu, German, Dutch	3	4	4	4	1	no	1	no
A03	JNU	low	male	21	Hindi	English, German	5	4	3	3	2	no	2	no
A04	JNU	low	male	20	Hindi	English, German	3	4	4	3	1	no	1	no
A05	JNU	low	male	20	Bhojpuri	Hindi, English, German	5	5	4	4	1.5	no	1.5	no
A06	JNU	low	female	22	Bengali	Hindi, English, German	3	4	2	2	1	no	1	no
A07	JNU	low	male	19	Bangla, Sylheti	Hindi, English, Urdu, Persian, Assamese, Arabic, German	5	5	3	2	1	no	1	no
A08	JNU	low	male	20	Hindi	English, German	2	3	2	3	1	no	0.3	no
A09	JNU	low	male	19	Hindi	English, German	3	3	2	3	1	no	1	no
A10	JNU	low	male	19	Hindi	English, Sanskrit, German, Turkish	3	3	3	4	1	no	1	no
A11	JNU	low	male	21	Hindi	English, German, Sanskrit, Turkish	2	3	5	2	1	no	1	no
A12	JNU	low	female	19	Hindi, Bhojpuri	English, German, Turkish	5	5	3	2	1	no	1	no
A13	JNU	low	male	21	Hindi	English, Indonesian, Sanskrit, German	4	4	3	4	1	no	1	no
A14	JNU	low	male	23	Urdu	Hindi, Arabic, Persian, English, German	2	3	3	3	1	no	0.25	no
A15	JNU	low	female	18	Hindi	English, German, Sanskrit	2	3	4	3	2	no	2	no
A16	JNU	low	female	19	Hindi	English, German	2	3	2	2	1	no	1	no
A17	JNU	low	female	19	Tibetan, Hindi	English, Nepali, Dutch, German	4	4	3	2	1	no	1	no
A18	JNU	low	male	21	Hindi	English, German, Hebrew	4	4	3	3	3	no	3	no
A19	JNU	low	female	20	Hindi	English, German	3	4	4	5	3	no	3	no
A20	JNU	low	female	20	Hindi	English, German, Turkish	4	4	3	2	1	no	1	no
A21	JNU	low	female	20	Hindi	English, German, Spanish, Japanese	3	3	4	3	3	no	3	no
B01	JNU	high	female	20	Hindi, Panjabi	English, German, Chinese (Pinin)	4	5	4	5	10	6	4	no
B02	JNU	high	male	21	Magahi, Hindi	English, German	4	5	3	4	3	no	3	no

ID	group		sex	age	L1s	L2s	self assesment L2 German (1-6)				duration of L2 German			stay in DE
	L1	profic.					listening	reading	speaking	writing	total	school	university	
B03	JNU	high	male	20	Hindi	English, German	3	4	4	4	3	no	3	no
B04	JNU	high	female	20	Marathi	Hindi, English, Sanskrit, German	4	5	5	6	5	2	3	no
B05	JNU	high	male	25	Hindi	English, German	3	3	3	3	5	no	4	no
B06	JNU	high	female	22	Hindi, Panjabi	Sanskrit, English, German	4	6	4	6	3	no	3	no
B07	JNU	high	female	22	Bhojpuri, Hindi, Urdu	English, Sanskrit, German, Hebrew	4	4	3	4	3.5	no	3.5	no
B08	JNU	high	male	24	Hindi	Marwadi, English, French, German	4	5	3	3	4	no	4	no
B09	JNU	high	female	26	Hindi, Sindhi	English, German	4	5	5	5	7	no	1.5	no
B10	JNU	high	female	23	Hindi	Punjabi, English, German	6	5	5	5	6	no	1.5	no
B11	JNU	high	male	23	Hindi, Garhwali	English, German	5	4	4	4	5	no	5	no
B12	JNU	high	male	24	Hindi, Panjabi	English, German	5	5	4	4	5	no	5	no
B13	JNU	high	female	22	Hindi	English, Sanskrit, German, Greek, Urdu	4	5	4	5	5	no	5	no
B14	JNU	high	male	23	Bhojpuri, Hindi	English, German	4	6	5	5	5	no	5	no
B15	JNU	high	male	21	Hindi, English, Garhwali (Uttrakhendi), Haryanvi	German, Japanese, Greek, Gujarati	4	5	4	5	3	no	3	no
B16	JNU	high	female	21	Hindi	English, German	4	4	3	4	5	1	4	no
B17	JNU	high	female	21	Hindi	English, German	3	4	3	3	3	no	3	no
B18	JNU	high	female	24	Tamil	Hindi, English, German	2	4	3	4	4	no	4	no
B19	JNU	high	female	20	Hindi	Magahi, English, German, Hebrew	2	3	3	3	3.5	no	3.5	no
B20	JNU	high	male	23	Hindi, Urdu, Magahi	English, German, French	3	4	3	3	3.5	no	3.5	no
C01	UVR	low	female	20	Italian	Arabic, Veronese, English, German, Spanish, French	3	5	4	4	10	8	2	no
C02	UVR	low	female	20	Italian	English, German, Spanish	3	4	3	5	10	8	2	no

ID	group		sex	age	L1s	L2s	self assesment L2 German (1-6)				duration of L2 German			stay in DE
	L1	profic.					listening	reading	speaking	writing	total	school	university	
C03	UVR	low	female	20	Italian	English, German, French, Spanish	3	4	3	3	7	5	2	no
C04	UVR	low	female	20	Italian	English, German, French	4	4	3	3	9	7	2	no
C05	UVR	low	female	21	Italian	English, Spanish, German	3	3	4	3	8	5	2	no
D01	UVR	high	female	21	Italian	Veronese (southern variation), English, Spanish, German, Latin, Ancient Greek	3	4	2	3	3	no	3	no
D02	UVR	high	female	22	Italian	English, German, Spanish	5	4	3	3	9	5	3	no
D03	UVR	high	female	22	Italian	English, French, German	2	3	2	3	3	no	3	no
D04	UVR	high	female	21	Italian	English, Latin, Ancient Greek, German, Spanish	4	4	4	3	3	no	3	no
D05	UVR	high	female	21	Italian	German, English, French	3	4	3	4	16	13	3	no
D06	UVR	high	female	22	Italian	German, English, Spanish	4	4	3	4	17	13	3	no
D07	UVR	high	female	21	Italian	English, Spanish, German	3	3	3	3	8	5	3	no
D08	UVR	high	female	21	Italian	English, French, German	5	3	4	4	7	3	3	no
D09	UVR	high	female	22	Italian	Veronese, English, German, Spanish, Russian	3	4	3	3	5	2	3	no
D10	UVR	high	female	21	Italian	English, German, Spanish, French	5	5	4	4	11	8	3	no
D11	UVR	high	female	25	Italian	English, German, Spanish	3	3	4	4	13	8	3	no
D12	UVR	high	female	21	Italian	English, German, Russian	3	4	3	4	8	3	3	no
D13	UVR	high	male	21	Italian	English, French, German, Spanish, Russian	3	5	4	5	8	5	3	no
D14	UVR	high	female	22	Italian	Brescia (dialect), English, German, Spanish, French	3	4	3	3	11	8	3	no

A.6 Instructions and materials from Experiment 6 (elicited production task)

A.6.1 Instructions

Herzlich Willkommen!
In diesem Experiment bitten wir dich, komplexe Sätze zu bilden und auszusprechen.

Dafür geben wir dir:

- 2 einfache Sätze,
- die Verbindung zwischen den beiden Sätzen und
- eine Vorlage mit Lücken.

Du sollst die beiden einfachen Sätze zu einem ganzen (komplexen) Satz zusammenfügen und aussprechen.
Jetzt gibt es erstmal eine kleine Übung.

Hier nochmal die Aufgabe:

1. Lies die Sätze
2. Schaue dir das Muster mit der Lücke an
3. Sprich den komplexen Satz laut und deutlich aus – In der Übung kannst du mit der Leertaste die Lösung ansehen. –
4. Wenn du den Satz gesprochen hast, dann drücke die Enter-Taste, um den nächsten Satz zu sehen.

Auf den nächsten Seiten wirst du einmal alle Satztypen und alle Muster mit Lücken kennenlernen.

– practice phase –

Alles klar?
Wenn du noch Fragen hast, dann wende dich jetzt an den Versuchsleiter.
Wenn du die Leertaste drückst, beginnt das Experiment.

A.6.2 Practice items

1. ID: *practice_declarative*
   Peter hat etwas geglaubt. | Und zwar Folgendes: | Maria hat das Haus gesehen.

MC-EC: ____, dass ____. (Peter hat geglaubt, dass Maria das Haus gesehen hat.)

EC-MC: Dass ____, ____. (Dass Maria das Haus gesehen hat, hat Peter geglaubt.)

2. ID: *practice_yn-interrogative*
   Peter hat etwas nicht gewusst. | Nämlich, ob Folgendes wahr ist: | Maria hat das Haus gesehen.

MC-EC: ____, ob ____. (Peter hat nicht gewusst, ob Maria das Haus gesehen hat.)

EC-MC: Ob ____, ____. (Ob Maria das Haus gesehen hat, hat Peter nicht gewusst.)

3. ID: *practice_wh-interrogative*
   Peter hat etwas untersucht. | Und zwar Folgendes: | Wer hat das Haus gesehen?

MC-EC: ____, wer ____. (Peter hat untersucht, wer das Haus gesehen hat.)

EC-MC: Wer ____, ____. (Wer das Haus gesehen hat, hat Peter untersucht.)

4. ID: *practice_temporal*
   Peter hat die Schule verlassen. | Davor ist Folgendes passiert: | Maria hat das Haus gesehen.

MC-EC: ____, nachdem ____. (Peter hat die Schule verlassen, nachdem Maria das Haus gesehen hat.)

EC-MC: Nachdem ____, ____. (Nachdem Maria das Haus gesehen hat, hat Peter die Schule verlassen.)

5. ID: *practice_causal*
   Peter hat eine Suppe gekocht. | Der Grund dafür ist: | Maria hat noch nichts gegessen.

MC-EC: ____, weil ____. (Peter hat eine Suppe gekocht, weil Maria noch nichts gegessen hat.)

EC-MC: Weil ____, ____. (Weil Maria noch nichts gegessen hat, hat Peter eine Suppe gekocht.)

6. ID: *practice_concessive*
   Peter hat eine Suppe gekocht. | Und trotzdem gilt: | Maria hat nichts gegessen.

MC-EC: ____, obwohl ____. (Maria hat nichts gegessen, obwohl Peter eine Suppe gekocht hat.)

EC-MC: Obwohl ____, ____. (Obwohl Peter eine Suppe gekocht hat, hat Maria nichts gegessen.)

7. ID: *practice_conditional*
   Peter kann das Zugticket kaufen. | Voraussetzung dafür ist Folgendes: | Sein Chef hat den Lohn bezahlt.

MC-EC: ____, wenn ____. (Peter kann das Zugticket kaufen, wenn sein Chef den Lohn bezahlt hat.)

EC-MC: Wenn ____, ____. (Wenn sein Chef den Lohn bezahlt hat, kann Peter das Zugticket kaufen.)

8. ID: *practice_relative*
   Peter hat die Suppe gekocht. | Und die Suppe: | Die hat sich Maria gewünscht.

MC-EC: ____ gekocht, die ____. (Peter hat die Suppe gekocht, die sich Maria gewünscht hat.)

EC-MC: ____, die ____, gekocht. (Peter hat die Suppe, die sich Maria gewünscht hat, gekocht.)

A.6.3 Experimental items

1. ID: *junge*
   Die Eltern haben etwas geglaubt. | Und zwar Folgendes: | Der Junge hat die Schokolade bezahlt.

MC-EC: ____, dass ____. (Die Eltern haben geglaubt, dass der Junge die Schokolade bezahlt hat.)

EC-MC: Dass ____, ____. (Dass der Junge die Schokolade bezahlt hat, haben die Eltern geglaubt.)

2. ID: *dame*
   Der Kellner hat etwas gesehen. | Und zwar Folgendes: | Die Dame hat den Zucker gesucht.

MC-EC: ____, dass ____. (Der Kellner hat gesehen, dass die Dame den Zucker gesucht hat.)

EC-MC: Dass ____, ____. (Dass die Dame den Zucker gesucht hat, hat der Kellner gesehen.)

3. ID: *busfahrer*
   Die Touristen haben etwas gehofft. | Und zwar Folgendes: | Der Busfahrer hat das Gepäck gefunden.

MC-EC: ____, dass ____. (Die Touristen haben gehofft, dass der Busfahrer das Gepäck gefunden hat.)

EC-MC: Dass ____, ____. (Dass der Busfahrer das Gepäck gefunden hat, haben die Touristen gehofft.)

4. ID: *hund*
   Der Großvater hat etwas behauptet. | Und zwar Folgendes: | Der Hund hat die Zeitung gefressen.

MC-EC: ____, dass ____. (Der Großvater hat behauptet, dass der Hund die Zeitung gefressen hat.)

EC-MC: Dass ____, ____. (Dass der Hund die Zeitung gefressen hat, hat der Großvater behauptet.)

5. ID: *patient*
   Die Ärztin hat etwas gedacht. | Und zwar Folgendes: | Der Patient hat die Pillen geschluckt.

MC-EC: ____, dass ____. (Die Ärztin hat gedacht, dass der Patient die Pillen geschluckt hat.)

EC-MC: Dass ____, ____. (Dass der Patient die Pillen geschluckt hat, hat die Ärztin gedacht.)

6. ID: *sekretaerin*
   Der Chef hat etwas bezweifelt. | Und zwar Folgendes: | Die Sekretärin hat den Brief geschrieben.

MC-EC: ____, dass ____. (Der Chef hat bezweifelt, dass die Sekretärin den Brief geschrieben hat.)

EC-MC: Dass ____, ____. (Dass die Sekretärin den Brief geschrieben hat, hat der Chef bezweifelt.)

7. ID: *nachbar*
   Der Vater hat etwas nicht gewusst. | Nämlich, ob Folgendes wahr ist: | Der Nachbar hat den Hund getötet.

MC-EC: ____, ob ____. (Der Vater hat nicht gewusst, ob der Nachbar den Hund getötet hat.)

EC-MC: Ob ____, ____. (Ob der Nachbar den Hund getötet hat, hat der Vater nicht gewusst.)

8. ID: *schueler*
   Der Lehrer hat etwas nicht verstanden. | Nämlich, ob Folgendes wahr ist: | Der Schüler hat die Prüfung bestanden.

MC-EC: ____, ob ____. (Der Lehrer hat nicht verstanden, ob der Schüler die Prüfung bestanden hat.)

EC-MC: Ob ____, ____. (Ob der Schüler die Prüfung bestanden hat, hat der Lehrer nicht verstanden.)

9. ID: *gast*
   Die Familie hat etwas überprüft. | Nämlich, ob Folgendes wahr ist: | Der Gast hat das Zimmer aufgeräumt.

   MC-EC: ____, ob ____. (Die Familie hat überprüft, ob der Gast das Zimmer aufgeräumt hat.)

   EC-MC: Ob ____, ____. (Ob der Gast das Zimmer aufgeräumt hat, hat die Familie überprüft.)

10. ID: *politiker*
    Der Journalist hat etwas gefragt. | Nämlich, ob Folgendes wahr ist: | Der Politiker hat den Vertrag unterschrieben.

    MC-EC: ____, ob ____. (Der Journalist hat gefragt, ob der Politiker den Vertrag unterschrieben hat.)

    EC-MC: Ob ____, ____. (Ob der Politiker den Vertrag unterschrieben hat, hat der Journalist gefragt.)

11. ID: *maedchen*
    Die Mutter hat etwas kontrolliert. | Nämlich, ob Folgendes wahr ist: | Das Mädchen hat die Schultasche gepackt.

    MC-EC: ____, ob ____. (Die Mutter hat kontrolliert, ob das Mädchen die Schultasche gepackt hat.)

    EC-MC: Ob ____, ____. (Ob das Mädchen die Schultasche gepackt hat, hat die Mutter kontrolliert.)

12. ID: *moerder*
    Die Detektive haben etwas untersucht. | Nämlich, ob Folgendes wahr ist: | Der Mörder hat den Aufzug benutzt.

    MC-EC: ____, ob ____. (Die Detektive haben untersucht, ob der Mörder den Aufzug benutzt hat.)

    EC-MC: Ob ____, ____. (Ob der Mörder den Aufzug benutzt hat, haben die Detektive untersucht.)

13. ID: *diamanten*
    Der Polizist hat etwas untersucht. | Und zwar Folgendes: | Wer hat die Diamanten gestohlen?

    MC-EC: ____, wer ____. (Der Polizist hat untersucht, wer die Diamanten gestohlen hat.)

    EC-MC: Wer ____, ____. (Wer die Diamanten gestohlen hat, hat der Polizist untersucht.)

14. ID: *oper*
    Die Musikerin hat etwas geahnt. | Und zwar Folgendes: | Wer hat die Oper komponiert?

    MC-EC: ____, wer ____. (Die Musikerin hat geahnt, wer die Oper komponiert hat.)

    EC-MC: Wer ____, ____. (Wer die Oper komponiert hat, hat die Musikerin geahnt.)

15. ID: *essen*
    Der König hat etwas gefragt. | Und zwar Folgendes: | Wer hat das Essen gekocht?

    MC-EC: ____, wer ____. (Der König hat gefragt, wer das Essen gekocht hat.)

    EC-MC: Wer ____, ____. (Wer das Essen gekocht hat, hat der König gefragt.)

16. ID: *zigarette*
    Die Krankenschwester hat etwas gewusst. | Und zwar Folgendes: | Wer hat eine Zigarette geraucht?

MC-EC: ____, wer ____. (Die Krankenschwester hat gewusst, wer eine Zigarette geraucht hat.)

EC-MC: Wer ____, ____. (Wer eine Zigarette geraucht hat, hat die Krankenschwester gewusst.)

17. ID: *kuchen*
    Der Onkel hat etwas erfahren. | Und zwar Folgendes: | Wer hat den Kuchen gebacken?

    MC-EC: ____, wer ____. (Der Onkel hat erfahren, wer den Kuchen gebacken hat.)

    EC-MC: Wer ____, ____. (Wer den Kuchen gebacken hat, hat der Onkel erfahren.)

18. ID: *turnier*
    Die Tänzerin hat etwas erzählt. | Und zwar Folgendes: | Wer hat das Turnier gewonnen?

    MC-EC: ____, wer ____. (Die Tänzerin hat erzählt, wer das Turnier gewonnen hat.)

    EC-MC: Wer ____, ____. (Wer das Turnier gewonnen hat, hat die Tänzerin erzählt.)

19. ID: *schauspielerin*
    Der Zuschauer hat die Karte verkauft. | Davor ist Folgendes passiert: | Die Schauspielerin hat das Theater gewechselt.

    MC-EC: ____, nachdem ____. (Der Zuschauer hat die Karte verkauft, nachdem die Schauspielerin das Theater gewechselt hat.)

    EC-MC: Nachdem ____, ____. (Nachdem die Schauspielerin das Theater gewechselt hat, hat der Zuschauer die Karte verkauft.)

20. ID: *passagier*
    Der Pilot hat die Stewardess angerufen. | Davor ist Folgendes passiert: | Der Passagier hat den Koffer gefunden.

    MC-EC: ____, nachdem ____. (Der Pilot hat die Stewardess angerufen, nachdem der Passagier den Koffer gefunden hat.)

    EC-MC: Nachdem ____, ____. (Nachdem der Passagier den Koffer gefunden hat, hat der Pilot die Stewardess angerufen.)

21. ID: *kunde*
    Die Kollegin hat einen Tee gekocht. | Davor ist Folgendes passiert: | Der Kunde hat den Raum verlassen.

    MC-EC: ____, nachdem ____. (Die Kollegin hat einen Tee gekocht, nachdem der Kunde den Raum verlassen hat.)

    EC-MC: Nachdem ____, ____. (Nachdem der Kunde den Raum verlassen hat, hat die Kollegin einen Tee gekocht.)

22. ID: *tochter*
    Die Mutter hat den Fernseher eingeschaltet. | Davor ist Folgendes passiert: | Die Tochter hat die Hausaufgaben gemacht.

    MC-EC: ____, nachdem ____. (Die Mutter hat den Fernseher eingeschaltet, nachdem die Tochter die Hausaufgaben gemacht hat.)

    EC-MC: Nachdem ____, ____. (Nachdem die Tochter die Hausaufgaben gemacht hat, hat die Mutter den Fernseher eingeschaltet.)

23. ID: *pferd*
    Der Bauer hat seinen Sohn angeschrien. | Davor ist Folgendes passiert: | Das Pferd hat die Pflanzen gefressen.

    MC-EC: ____, nachdem ____. (Der Bauer hat seinen Sohn angeschrien, nachdem das Pferd die Pflanzen gefressen hat.)

    EC-MC: Nachdem ____, ____. (Nachdem das Pferd die Pflanzen gefressen hat, hat der Bauer seinen Sohn angeschrien.)

24. ID: *vater*
    Der Doktor hat angerufen. | Davor ist Folgendes passiert: | Der Vater hat einen Unfall gehabt.

    MC-EC: ____, nachdem ____. (Der Doktor hat angerufen, nachdem der Vater einen Unfall gehabt hat.)

    EC-MC: Nachdem ____, ____. (Nachdem der Vater einen Unfall gehabt hat, hat der Doktor angerufen.)

25. ID: *klingeln*
    Der Doktor hat das Telefon ausgeschaltet. | Der Grund dafür ist: | Das Klingeln hat die Leute gestört.

    MC-EC: ____, weil ____. (Der Doktor hat das Telefon ausgeschaltet, weil das Klingeln die Leute gestört hat.)

    EC-MC: Weil ____, ____. (Weil das Klingeln die Leute gestört hat, hat der Doktor das Telefon ausgeschaltet.)

26. ID: *sohn*
    Die Mutter hat gelacht. | Der Grund dafür ist: | Der Sohn hat einen Witz erzählt.

    MC-EC: ____, weil ____. (Die Mutter hat gelacht, weil der Sohn einen Witz erzählt hat.)

    EC-MC: Weil ____, ____. (Weil der Sohn einen Witz erzählt hat, hat die Mutter gelacht.)

27. ID: *direktor*
    Der Hausmeister hat gekündigt. | Der Grund dafür ist: | Der Direktor hat den Lohn gekürzt.

    MC-EC: ____, weil ____. (Der Hausmeister hat gekündigt, weil der Direktor den Lohn gekürzt hat.)

    EC-MC: Weil ____, ____. (Weil der Direktor den Lohn gekürzt hat, hat der Hausmeister gekündigt.)

28. ID: *lehrer*
    Die Schülerin hat geantwortet. | Der Grund dafür ist: | Der Lehrer hat eine Frage gestellt.

    MC-EC: ____, weil ____. (Die Schülerin hat geantwortet, weil der Lehrer eine Frage gestellt hat.)

    EC-MC: Weil ____, ____. (Weil der Lehrer eine Frage gestellt hat, hat die Schülerin geantwortet.)

29. ID: *onkel*
    Die Tante hat geklopft. | Der Grund dafür ist: | Der Onkel hat die Tür verschlossen.

    MC-EC: ____, weil ____. (Die Tante hat geklopft, weil der Onkel die Tür verschlossen hat.)

    EC-MC: Weil ____, ____. (Weil der Onkel die Tür verschlossen hat, hat die Tante geklopft.)

30. ID: *kind*
    Der Autofahrer hat gebremst. | Der Grund dafür ist: | Ein Kind hat die Straße überquert.

    MC-EC: ____, weil ____. (Der Autofahrer hat gebremst, weil ein Kind die Straße überquert hat.)

    EC-MC: Weil ____, ____. (Weil ein Kind die Straße überquert hat, hat der Autofahrer gebremst.)

31. ID: *mechaniker*
    Der Mechaniker hat den Motor repariert. | Und trotzdem gilt: | Das Auto fährt nicht mehr.

    MC-EC: ____, obwohl ____. (Das Auto fährt nicht mehr, obwohl der Mechaniker den Motor repariert hat.)

    EC-MC: Obwohl ____, ____. (Obwohl der Mechaniker den Motor repariert hat, fährt das Auto nicht mehr.)

32. ID: *nachbarin*
    Die Nachbarin hat ein Fest gefeiert. | Und trotzdem gilt: | Der Arbeiter hat geschlafen.

    MC-EC: ____, obwohl ____. (Der Arbeiter hat geschlafen, obwohl die Nachbarin ein Fest gefeiert hat.)

    EC-MC: Obwohl ____, ____. (Obwohl die Nachbarin ein Fest gefeiert hat, hat der Arbeiter geschlafen.)

33. ID: *krankenschwester*
    Die Krankenschwester hat Schmerzmittel gebracht. | Und trotzdem gilt: | Die Patientin hat gelitten.

    MC-EC: ____, obwohl ____. (Die Patientin hat gelitten, obwohl die Krankenschwester Schmerzmittel gebracht hat.)

    EC-MC: Obwohl ____, ____. (Obwohl die Krankenschwester Schmerzmittel gebracht hat, hat die Patientin gelitten.)

34. ID: *chef*
    Der Chef hat eine Pause befohlen. | Und trotzdem gilt: | Der Angestellte arbeitet immer noch.

    MC-EC: ____, obwohl ____. (Der Angestellte arbeitet immer noch, obwohl der Chef eine Pause befohlen hat.)

    EC-MC: Obwohl ____, ____. (Obwohl der Chef eine Pause befohlen hat, arbeitet der Angestellte immer noch.)

35. ID: *soldat*
    Der Soldat hat das Tor schon geöffnet. | Und trotzdem gilt: | Die Touristin wartet immer noch.

    MC-EC: ____, obwohl ____. (Die Touristin wartet immer noch, obwohl der Soldat das Tor schon geöffnet hat.)

    EC-MC: Obwohl ____, ____. (Obwohl der Soldat das Tor schon geöffnet hat, wartet die Touristin immer noch.)

36. ID: *gaertner*
    Der Gärtner hat die Blätter abgeschnitten. | Und trotzdem gilt: | Die Pflanze blüht immer noch.

MC-EC: ____, obwohl ____. (Die Pflanze blüht immer noch, obwohl der Gärtner die Blätter abgeschnitten hat.)

EC-MC: Obwohl ____, ____. (Obwohl der Gärtner die Blätter abgeschnitten hat, blüht die Pflanze immer noch.)

37. ID: *tante*
    Der Student kann die Miete bezahlen. | Voraussetzung dafür ist Folgendes: | Die Tante hat das Geld überwiesen.

    MC-EC: ____, wenn ____. (Der Student kann die Miete bezahlen, wenn die Tante das Geld überwiesen hat.)

    EC-MC: Wenn ____, ____. (Wenn die Tante das Geld überwiesen hat, kann der Student die Miete bezahlen.)

38. ID: *assistent*
    Der Chef kann die Besprechung fortsetzen. | Voraussetzung dafür ist Folgendes: | Der Assistent hat das Handout kopiert.

    MC-EC: ____, wenn ____. (Der Chef kann die Besprechung fortsetzen, wenn der Assistent das Handout kopiert hat.)

    EC-MC: Wenn ____, ____. (Wenn der Assistent das Handout kopiert hat, kann der Chef die Besprechung fortsetzen.)

39. ID: *schwester*
    Der Bruder kann die Suppe kochen. | Voraussetzung dafür ist Folgendes: | Die Schwester hat das Gemüse gekauft.

    MC-EC: ____, wenn ____. (Der Bruder kann die Suppe kochen, wenn die Schwester das Gemüse gekauft hat.)

    EC-MC: Wenn ____, ____. (Wenn die Schwester das Gemüse gekauft hat, kann der Bruder die Suppe kochen.)

40. ID: *handwerker*
    Die Sportler können wieder trainieren. | Voraussetzung dafür ist Folgendes: | Der Handwerker hat die Heizung repariert.

    MC-EC: ____, wenn ____. (Die Sportler können wieder trainieren, wenn der Handwerker die Heizung repariert hat.)

    EC-MC: Wenn ____, ____. (Wenn der Handwerker die Heizung repariert hat, können die Sportler wieder trainieren.)

41. ID: *mutter*
    Der Junge kann den Koffer packen. | Voraussetzung dafür ist Folgendes: | Die Mutter hat die Kleider gewaschen.

    MC-EC: ____, wenn ____. (Der Junge kann den Koffer packen, wenn die Mutter die Kleider gewaschen hat.)

    EC-MC: Wenn ____, ____. (Wenn die Mutter die Kleider gewaschen hat, kann der Junge den Koffer packen.)

42. ID: *aerzte*
    Die Ärzte können den Opfern helfen. | Voraussetzung dafür ist Folgendes: | Der Feuerwehrmann hat das Feuer gelöscht.

    MC-EC: ____, wenn ____. (Die Ärzte können den Opfern helfen, wenn der Feuerwehrmann das Feuer gelöscht hat.)

    EC-MC: Wenn ____, ____. (Wenn der Feuerwehrmann das Feuer gelöscht hat, können die Ärzte den Opfern helfen.)

43. ID: *grossvater*
    Der Junge hat das Fahrrad verloren. | Und das Fahrrad: | Das hat der Großvater repariert.

    MC-EC: ____ verloren, das ____. (Der Junge hat das Fahrrad verloren, das der Großvater repariert hat.)

    EC-MC: ____, das ____, verloren. (Der Junge hat das Fahrrad, das der Großvater repariert hat, verloren.)

44. ID: *geschichte*
    Das Mädchen hat die Geschichte vergessen. | Und die Geschichte: | Die hat der Lehrer erzählt.

    MC-EC: ____ vergessen, die ____. (Das Mädchen hat die Geschichte vergessen, die der Lehrer erzählt hat.)

    EC-MC: ____, die ____, vergessen. (Das Mädchen hat die Geschichte, die der Lehrer erzählt hat, vergessen.)

45. ID: *teppich*
    Der Student hat den Teppich gewaschen. | Und den Teppich: | Den hat die Großmutter gekauft.

    MC-EC: ____ gewaschen, den ____. (Der Student hat den Teppich gewaschen, den die Großmutter gekauft hat.)

    EC-MC: ____, den ____, gewaschen. (Der Student hat den Teppich, den die Großmutter gekauft hat, gewaschen.)

46. ID: *brief*
    Die Sekretärin hat den Brief gelesen. | Und den Brief: | Den hat der Chef geschrieben.

    MC-EC: ____ gelesen, den ____. (Die Sekretärin hat den Brief gelesen, den der Chef geschrieben hat.)

    EC-MC: ____, den ____, gelesen. (Die Sekretärin hat den Brief, den der Chef geschrieben hat, gelesen.)

47. ID: *tee*
    Der Gast hat den Tee getrunken. | Und den Tee: | Den hat die Tochter gekocht.

    MC-EC: ____ getrunken, den ____. (Der Gast hat den Tee getrunken, den die Tochter gekocht hat.)

    EC-MC: ____, den ____, getrunken. (Der Gast hat den Tee, den die Tochter gekocht hat, getrunken.)

48. ID: *boot*
    Der Kapitän hat das Boot gesteuert. | Und das Boot: | Das hat der Präsident bestellt.

MC-EC: ____ gesteuert, das ____. (Der Kapitän hat das Boot gesteuert, das der Präsident bestellt hat.)

EC-MC: ____, das ____, gesteuert. (Der Kapitän hat das Boot, das der Präsident bestellt hat, gesteuert.)

A.7 Instructions and materials from Experiment 7 (elicited imitation task)

A.7.1 Instructions

Herzlich Willkommen,
in diesem Experiment sollst du Sätze wiederholen.
Der Ablauf ist folgendermaßen:

1. Du siehst ein Kreuz
2. Wenn du die Leertaste drückst, hörst du einen Satz.
3. Wenn du den Satz nicht verstanden hast, drücke die Leertaste und du kannst ihn nochmal anhören.
4. Wenn du den Satz verstanden hast, wiederhole ihn.
5. Wenn du den Satz wiederholt hast, drücke die Enter-Taste.

Du bekommst jetzt erstmal ein paar Übungssätze.
Wenn du Fragen hast, dann frage jetzt den Übungsleiter.

– *practice phase* –

Alles klar?
Die Übung ist vorbei. Wenn du die Leertaste drückst, beginnt das Experiment.
Wenn du noch Fragen hast, dann frage jetzt den Versuchsleiter.

A.7.2 Practice items

1. ID *practice1*
   Ich wohne in Indien.
2. ID *practice2*
   Mein Professor hat ein Buch gekauft.
3. ID *practice3*
   Der Student hat gesagt, dass er heute Geburtstag hat.

A.7.3 Experimental items

1. ID: *junge*

V-final: Die Eltern haben geglaubt, dass der Junge die Schokolade bezahlt hat.

V2: Die Eltern haben geglaubt, dass der Junge hat die Schokolade bezahlt.

2. ID: *dame*

V-final: Der Kellner hat gesehen, dass die Dame den Zucker gesucht hat.

V2: Der Kellner hat gesehen, dass die Dame hat den Zucker gesucht.

3. ID: *busfahrer*

V-final: Die Touristen haben gehofft, dass der Busfahrer das Gepäck gefunden hat.

V2: Die Touristen haben gehofft, dass der Busfahrer hat das Gepäck gefunden.

4. ID: *hund*

V-final: Der Großvater hat behauptet, dass der Hund die Zeitung gefressen hat.

V2: Der Großvater hat behauptet, dass der Hund hat die Zeitung gefressen.

5. ID: *patient*

V-final: Die Ärztin hat gedacht, dass der Patient die Pillen geschluckt hat.

V2: Die Ärztin hat gedacht, dass der Patient hat die Pillen geschluckt.

6. ID: *sekretaerin*

V-final: Der Chef hat bezweifelt, dass die Sekretärin den Brief geschrieben hat.

V2: Der Chef hat bezweifelt, dass die Sekretärin hat den Brief geschrieben.

7. ID: *nachbar*

V-final: Der Vater hat nicht gewusst, ob der Nachbar den Hund getötet hat.

V2: Der Vater hat nicht gewusst, ob der Nachbar hat den Hund getötet.

8. ID: *schueler*

V-final: Der Lehrer hat nicht verstanden, ob der Schüler die Prüfung bestanden hat.

V2: Der Lehrer hat nicht verstanden, ob der Schüler hat die Prüfung bestanden.

9. ID: *gast*

V-final: Die Familie hat überprüft, ob der Gast das Zimmer aufgeräumt hat.

V2: Die Familie hat überprüft, ob der Gast hat das Zimmer aufgeräumt.

10. ID: *politiker*

V-final: Der Journalist hat gefragt, ob der Politiker den Vertrag unterschrieben hat.

V2: Der Journalist hat gefragt, ob der Politiker hat den Vertrag unterschrieben.

11. ID: *maedchen*

V-final: Die Mutter hat kontrolliert, ob das Mädchen die Schultasche gepackt hat.

V2: Die Mutter hat kontrolliert, ob das Mädchen hat die Schultasche gepackt.

12. ID: *moerder*

V-final: Die Detektive haben untersucht, ob der Mörder den Aufzug benutzt hat.

V2: Die Detektive haben untersucht, ob der Mörder hat den Aufzug benutzt.

13. ID: *diamanten*

V-final: Der Polizist hat untersucht, wer die Diamanten gestohlen hat.

V2: Der Polizist hat untersucht, wer hat die Diamanten gestohlen.

14. ID: *oper*

V-final: Die Musikerin hat geahnt, wer die Oper komponiert hat.

V2: Die Musikerin hat geahnt, wer hat die Oper komponiert.

15. ID: *essen*

V-final: Der König hat gefragt, wer das Essen gekocht hat.

V2: Der König hat gefragt, wer hat das Essen gekocht.

16. ID: *zigarette*

V-final: Die Krankenschwester hat gewusst, wer eine Zigarette geraucht hat.

V2: Die Krankenschwester hat gewusst, wer hat eine Zigarette geraucht.

17. ID: *kuchen*

V-final: Der Onkel hat erfahren, wer den Kuchen gebacken hat.

V2: Der Onkel hat erfahren, wer hat den Kuchen gebacken.

18. ID: *turnier*

V-final: Die Tänzerin hat erzählt, wer das Turnier gewonnen hat.

V2: Die Tänzerin hat erzählt, wer hat das Turnier gewonnen.

19. ID: *schauspielerin*

V-final: Der Zuschauer hat die Karte verkauft, nachdem die Schauspielerin das Theater gewechselt hat.

V2: Der Zuschauer hat die Karte verkauft, nachdem die Schauspielerin hat das Theater gewechselt.

20. ID: *passagier*

V-final: Der Pilot hat die Stewardess angerufen, nachdem der Passagier den Koffer gefunden hat.

V2: Der Pilot hat die Stewardess angerufen, nachdem der Passagier hat den Koffer gefunden.

21. ID: *kunde*

V-final: Die Kollegin hat einen Tee gekocht, nachdem der Kunde den Raum verlassen hat.

V2: Die Kollegin hat einen Tee gekocht, nachdem der Kunde hat den Raum verlassen.

22. ID: *tochter*

V-final: Die Mutter hat den Fernseher eingeschaltet, nachdem die Tochter die Hausaufgaben gemacht hat.

V2: Die Mutter hat den Fernseher eingeschaltet, nachdem die Tochter hat die Hausaufgaben gemacht.

23. ID: *pferd*

V-final: Der Bauer hat seinen Sohn angeschrien, nachdem das Pferd die Pflanzen gefressen hat.

V2: Der Bauer hat seinen Sohn angeschrien, nachdem das Pferd hat die Pflanzen gefressen.

24. ID: *vater*

V-final: Der Doktor hat angerufen, nachdem der Vater einen Unfall gehabt hat.

V2: Der Doktor hat angerufen, nachdem der Vater hat einen Unfall gehabt.

25. ID: *klingeln*

V-final: Der Doktor hat das Telefon ausgeschaltet, weil das Klingeln die Leute gestört hat.

V2: Der Doktor hat das Telefon ausgeschaltet, weil das Klingeln hat die Leute gestört.

26. ID: *sohn*

V-final: Die Mutter hat gelacht, weil der Sohn einen Witz erzählt hat.

V2: Die Mutter hat gelacht, weil der Sohn hat einen Witz erzählt.

27. ID: *direktor*

V-final: Der Hausmeister hat gekündigt, weil der Direktor den Lohn gekürzt hat.

V2: Der Hausmeister hat gekündigt, weil der Direktor hat den Lohn gekürzt.

28. ID: *lehrer*

V-final: Die Schülerin hat geantwortet, weil der Lehrer eine Frage gestellt hat.

V2: Die Schülerin hat geantwortet, weil der Lehrer hat eine Frage gestellt.

29. ID: *onkel*

V-final: Die Tante hat geklopft, weil der Onkel die Tür verschlossen hat.

V2: Die Tante hat geklopft, weil der Onkel hat die Tür verschlossen.

30. ID: *kind*

V-final: Der Autofahrer hat gebremst, weil ein Kind die Straße überquert hat.

V2: Der Autofahrer hat gebremst, weil ein Kind hat die Straße überquert.

31. ID: *mechaniker*

V-final: Das Auto fährt nicht mehr, obwohl der Mechaniker den Motor repariert hat.

V2: Das Auto fährt nicht mehr, obwohl der Mechaniker hat den Motor repariert.

32. ID: *nachbarin*

V-final: Der Arbeiter hat geschlafen, obwohl die Nachbarin ein Fest gefeiert hat.

V2: Der Arbeiter hat geschlafen, obwohl die Nachbarin hat ein Fest gefeiert.

33. ID: *krankenschwester*

V-final: Die Patientin hat gelitten, obwohl die Krankenschwester Schmerzmittel gebracht hat.

V2: Die Patientin hat gelitten, obwohl die Krankenschwester hat Schmerzmittel gebracht.

34. ID: *chef*

V-final: Der Angestellte arbeitet immer noch, obwohl der Chef eine Pause befohlen hat.

V2: Der Angestellte arbeitet immer noch, obwohl der Chef hat eine Pause befohlen.

35. ID: *soldat*

V-final: Die Touristin wartet immer noch, obwohl der Soldat das Tor schon geöffnet hat.

V2: Die Touristin wartet immer noch, obwohl der Soldat hat das Tor schon geöffnet.

36. ID: *gaertner*

V-final: Die Pflanze blüht immer noch, obwohl der Gärtner die Blätter abgeschnitten hat.

V2: Die Pflanze blüht immer noch, obwohl der Gärtner hat die Blätter abgeschnitten.

37. ID: *tante*

V-final: Wenn die Tante das Geld überwiesen hat, kann der Student die Miete bezahlen.

V2: Wenn die Tante hat das Geld überwiesen, kann der Student die Miete bezahlen.

38. ID: *assistent*

V-final: Wenn der Assistent das Handout kopiert hat, kann der Chef die Besprechung fortsetzen.

V2: Wenn der Assistent hat das Handout kopiert, kann der Chef die Besprechung fortsetzen.

39. ID: *schwester*

V-final: Wenn die Schwester das Gemüse gekauft hat, kann der Bruder die Suppe kochen.

V2: Wenn die Schwester hat das Gemüse gekauft, kann der Bruder die Suppe kochen.

40. ID: *handwerker*

V-final: Wenn der Handwerker die Heizung repariert hat, können die Sportler wieder trainieren.

V2: Wenn der Handwerker hat die Heizung repariert, können die Sportler wieder trainieren.

41. ID: *mutter*

V-final: Wenn die Mutter die Kleider gewaschen hat, kann der Junge den Koffer packen.

V2: Wenn die Mutter hat die Kleider gewaschen, kann der Junge den Koffer packen.

42. ID: *aerzte*

V-final: Wenn der Feuerwehrmann das Feuer gelöscht hat, können die Ärzte den Opfern helfen.

V2: Wenn der Feuerwehrmann hat das Feuer gelöscht, können die Ärzte den Opfern helfen.

43. ID: *grossvater*

V-final: Der Junge hat das Fahrrad, das der Großvater repariert hat, verloren.

V2: Der Junge hat das Fahrrad, das hat der Großvater repariert, verloren.

44. ID: *geschichte*

V-final: Das Mädchen hat die Geschichte, die der Lehrer erzählt hat, vergessen.

V2: Das Mädchen hat die Geschichte, die hat der Lehrer erzählt, vergessen.

45. ID: *teppich*

V-final: Der Student hat den Teppich, den die Großmutter gekauft hat, gewaschen.

V2: Der Student hat den Teppich, den hat die Großmutter gekauft, gewaschen.

46. ID: *brief*

V-final: Die Sekretärin hat den Brief, den der Chef geschrieben hat, gelesen.

V2: Die Sekretärin hat den Brief, den hat der Chef geschrieben, gelesen.

47. ID: *tee*

V-final: Der Gast hat den Tee, den die Tochter gekocht hat, getrunken.

V2: Der Gast hat den Tee, den hat die Tochter gekocht, getrunken.

48. ID: *boot*

V-final: Der Kapitän hat das Boot, das der Präsident bestellt hat, gesteuert.

V2: Der Kapitän hat das Boot, das hat der Präsident bestellt, gesteuert.

A.7.4 Filler items

1. ID: *filler1*
   Der Verkäufer singt ein Lied und der Kunde kauft eine Flasche Wasser.

2. ID: *filler2*
   Der Rentner ist nach Hause gegangen und seine Frau hat Kaffee gekocht.

3. ID: *filler3*
   Die Fußballmannschaft ist Weltmeister geworden und die Leute haben auf der Straße getanzt.

4. ID: *filler4*
   Die Vermieterin ist zum Bahnhof gefahren, aber der Zug war schon weg.

5. ID: *filler5*
   Der Kaiser hat Geburtstag, aber sein bester Freund ist im Urlaub.

6. ID: *filler6*
   Peter möchte Mathematik studieren aber sein Vater will das nicht.

A.8 Instructions and materials from Experiment 8 and 9 (sentence matching task)

A.8.1 Instructions

Herzlich willkommen!
In diesem Experiment sollst du so schnell wie möglich entscheiden, ob du zwei identische oder zwei verschiedene Sätze gesehen hast.
Erst wirst du ein Kreuz in der Bildschirmmitte sehen.
Wenn du eine beliebige Taste drückst, erscheint ein Satz in der oberen Bildschirmhälfte.
Nach ca. 2 Sekunden erscheint ein zweiter Satz weiter unten.
Nach weiteren 2 Sekunden verschwinden beide Sätze.
Du sollst so schnell wie möglich entscheiden, ob die beiden Sätze identisch sind oder nicht.

- Wenn die Sätze identisch sind, drücke die 'M'-Taste (grün).
- Wenn die Sätze nicht identisch sind, drücke die 'Y'-Taste (rot).

Damit du so schnell wie möglich antworten kannst, bitten wir dich deine Zeigefinger auf den Tasten liegen zu lassen.
Du kannst drücken, sobald der zweite Satz erscheint.

Du bekommst jetzt erstmal ein paar Übungssätze, um dich an den Ablauf zu gewöhnen.

– *practice phase* –

Alles klar?
Wenn du noch Fragen hast, wende dich jetzt an den Versuchsleiter.
Wenn du die Leertaste drückst, beginnt das Experiment.
Du wirst drei Blöcke mit jeweils 25 Satzpaaren sehen. Zwischen den Blöcken kannst du so lange Pause machen, wie du möchtest.

A.8.2 Practice items

1. ID: *practice1*, match
   S1: Peter geht nach Hause.
   S2: Peter geht nach Hause.

2. ID: *practice2*, mismatch

S1: Das Buch ist sehr schön.

S2: Das Video ist ziemlich lang.

3. ID: *practice3*, mismatch

S1: Die Tasche ist aus dem Regal gefallen.

S2: Die Tasche ist aus dem Schrank gefallen.

4. ID: *practice4*, match

S1: Viele Haus mit sagen kleine der Vogel.

S2: Viele Haus mit sagen kleine der Vogel.

5. ID: *practice5*, mismatch

S1: Alle Kinder wollen wissen, ob sie ein Eis essen dürfen.

S2: Alle Schüler wollen wissen, ob sie ein Eis essen dürfen.

6. ID: *practice6*, match

S1: Der Tennisspieler schlagen den Ball ganz hart an das Netz.

S2: Der Tennisspieler schlagen den Ball ganz hart an das Netz.

7. ID: *practice7*, match

S1: Auch wenn es noch nicht spät ist, musst du nicht so laut sein.

S2: Auch wenn es noch nicht spät ist, musst du nicht so laut sein.

8. ID: *practice8*, mismatch

S1: Ein Tourist kommt mit dem Bus, der eine Klimaanlage hat.

S2: Ein Tourist kommt mit dem Zug, der eine Klimaanlage hat.

9. ID: *practice9*, match

S1: Du kannst nicht verstehen, dass wir schon gehen müssen.

S2: Du kannst nicht verstehen, dass wir schon gehen müssen.

A.8.3 Experimental items of Experiment 8

1. ID: *kaufen*

V2;OV: Gestern hat der Vater ein Haus gekauft.

T-final;OV: *Gestern der Vater ein Haus gekauft hat.

T-initial;OV: *Gestern der Vater hat ein Haus gekauft.

V2;VO: *Gestern hat der Vater gekauft ein Haus.

T-final;VO: *Gestern der Vater gekauft ein Haus hat.

T-initial;VO: *Gestern der Vater hat gekauft ein Haus.

2. ID: *sehen*

V2;OV: Heute hat der Junge das Boot gesehen.
T-final;OV: *Heute der Junge das Boot gesehen hat.
T-initial;OV: *Heute der Junge hat das Boot gesehen.
V2;VO: *Heute hat der Junge gesehen das Boot.
T-final;VO: *Heute der Junge gesehen das Boot hat.
T-initial;VO: *Heute der Junge hat gesehen das Boot.

3. ID: *benutzen*

V2;OV: Heute hat der Lehrer den Computer benutzt.
T-final;OV: *Heute der Lehrer den Computer benutzt hat.
T-initial;OV: *Heute der Lehrer hat den Computer benutzt.
V2;VO: *Heute hat der Lehrer benutzt den Computer.
T-final;VO: *Heute der Lehrer benutzt den Computer hat.
T-initial;VO: *Heute der Lehrer hat benutzt den Computer.

4. ID: *suchen*

V2;OV: Vorhin hat der Schauspieler das Theater gesucht.
T-final;OV: *Vorhin der Schauspieler das Theater gesucht hat.
T-initial;OV: *Vorhin der Schauspieler hat das Theater gesucht.
V2;VO: *Vorhin hat der Schauspieler gesucht das Theater.
T-final;VO: *Vorhin der Schauspieler gesucht das Theater hat.
T-initial;VO: *Vorhin der Schauspieler hat gesucht das Theater.

5. ID: *holen*

V2;OV: Mittags hat der Soldat das Gewehr geholt.
T-final;OV: *Mittags der Soldat das Gewehr geholt hat.
T-initial;OV: *Mittags der Soldat hat das Gewehr geholt.
V2;VO: *Mittags hat der Soldat geholt das Gewehr.
T-final;VO: *Mittags der Soldat geholt das Gewehr hat.
T-initial;VO: *Mittags der Soldat hat geholt das Gewehr.

6. ID: *lesen*

V2;OV: Gestern hat der Freund das Buch gelesen.
T-final;OV: *Gestern der Freund das Buch gelesen hat.
T-initial;OV: *Gestern der Freund hat das Buch gelesen.
V2;VO: *Gestern hat der Freund gelesen das Buch.

T-final;VO: *Gestern der Freund gelesen das Buch hat.
T-initial;VO: *Gestern der Freund hat gelesen das Buch.

7. ID: *spielen*

V2;OV: Abends hat der Mann mit dem Fußball gespielt.
T-final;OV: *Abends der Mann mit dem Fußball gespielt hat.
T-initial;OV: *Abends der Mann hat mit dem Fußball gespielt.
V2;VO: *Abends hat der Mann gespielt mit dem Fußball.
T-final;VO: *Abends der Mann gespielt mit dem Fußball hat.
T-initial;VO: *Abends der Mann hat gespielt mit dem Fußball.

8. ID: *lernen*

V2;OV: Letztes Jahr hat der Student eine Sprache gelernt.
T-final;OV: *Letztes Jahr der Student eine Sprache gelernt hat.
T-initial;OV: *Letztes Jahr der Student hat eine Sprache gelernt.
V2;VO: *Letztes Jahr hat der Student gelernt eine Sprache.
T-final;VO: *Letztes Jahr der Student gelernt eine Sprache hat.
T-initial;VO: *Letztes Jahr der Student hat gelernt eine Sprache.

9. ID: *trinken*

V2;OV: Manchmal hat der Onkel viel Bier getrunken.
T-final;OV: *Manchmal der Onkel viel Bier getrunken hat.
T-initial;OV: *Manchmal der Onkel hat viel Bier getrunken.
V2;VO: *Manchmal hat der Onkel getrunken viel Bier.
T-final;VO: *Manchmal der Onkel getrunken viel Bier hat.
T-initial;VO: *Manchmal der Onkel hat getrunken viel Bier.

10. ID: *kochen*

V2;OV: Heute hat die Mutter eine Suppe gekocht.
T-final;OV: *Heute die Mutter eine Suppe gekocht hat.
T-initial;OV: *Heute die Mutter hat eine Suppe gekocht.
V2;VO: *Heute hat die Mutter gekocht eine Suppe.
T-final;VO: *Heute die Mutter gekocht eine Suppe hat.
T-initial;VO: *Heute die Mutter hat gekocht eine Suppe.

11. ID: *besuchen*

V2;OV: Mittags hat meine Tante eine Freundin besucht.
T-final;OV: *Mittags meine Tante eine Freundin besucht hat.

T-initial;OV: *Mittags meine Tante hat eine Freundin besucht.
V2;VO: *Mittags hat meine Tante besucht eine Freundin.
T-final;VO: *Mittags meine Tante besucht eine Freundin hat.
T-initial;VO: *Mittags meine Tante hat besucht eine Freundin.

12. ID: *schreiben*

V2;OV: Letzte Woche hat der Politiker einen Brief geschrieben.
T-final;OV: *Letzte Woche der Politiker einen Brief geschrieben hat.
T-initial;OV: *Letzte Woche der Politiker hat einen Brief geschrieben.
V2;VO: *Letzte Woche hat der Politiker geschrieben einen Brief.
T-final;VO: *Letzte Woche der Politiker geschrieben einen Brief hat.
T-initial;VO: *Letzte Woche der Politiker hat geschrieben einen Brief.

13. ID: *finden*

V2;OV: Im Park hat der Polizist eine Tasche gefunden.
T-final;OV: *Im Park der Polizist eine Tasche gefunden hat.
T-initial;OV: *Im Park der Polizist hat eine Tasche gefunden.
V2;VO: *Im Park hat der Polizist gefunden eine Tasche.
T-final;VO: *Im Park der Polizist gefunden eine Tasche hat.
T-initial;VO: *Im Park der Polizist hat gefunden eine Tasche.

14. ID: *kopieren*

V2;OV: Am Morgen hat die Sekretärin ein Formular kopiert.
T-final;OV: *Am Morgen die Sekretärin ein Formular kopiert hat.
T-initial;OV: *Am Morgen die Sekretärin hat ein Formular kopiert.
V2;VO: *Am Morgen hat die Sekretärin kopiert ein Formular.
T-final;VO: *Am Morgen die Sekretärin kopiert ein Formular hat.
T-initial;VO: *Am Morgen die Sekretärin hat kopiert ein Formular.

15. ID: *vergessen*

V2;OV: Gestern hat die Tänzerin ihre Schuhe vergessen.
T-final;OV: *Gestern die Tänzerin ihre Schuhe vergessen hat.
T-initial;OV: *Gestern die Tänzerin hat ihre Schuhe vergessen.
V2;VO: *Gestern hat die Tänzerin vergessen ihre Schuhe.
T-final;VO: *Gestern die Tänzerin vergessen ihre Schuhe hat.
T-initial;VO: *Gestern die Tänzerin hat vergessen ihre Schuhe.

16. ID: *verkaufen*

V2;OV: Im Herbst hat der Bauer das Pferd verkauft.
T-final;OV: *Im Herbst der Bauer das Pferd verkauft hat.
T-initial;OV: *Im Herbst der Bauer hat das Pferd verkauft.
V2;VO: *Im Herbst hat der Bauer verkauft das Pferd.
T-final;VO: *Im Herbst der Bauer verkauft das Pferd hat.
T-initial;VO: *Im Herbst der Bauer hat verkauft das Pferd.

17. ID: *telefonieren*

V2;OV: Früh morgens hat der Präsident mit dem Minister telefoniert.
T-final;OV: *Früh morgens der Präsident mit dem Minister telefoniert hat.
T-initial;OV: *Früh morgens der Präsident hat mit dem Minister telefoniert.
V2;VO: *Früh morgens hat der Präsident telefoniert mit dem Minister.
T-final;VO: *Früh morgens der Präsident telefoniert mit dem Minister hat.
T-initial;VO: *Früh morgens der Präsident hat telefoniert mit dem Minister.

18. ID: *bekommen*

V2;OV: Letztes Jahr hat die Assistentin einen Schreibtisch bekommen.
T-final;OV: *Letztes Jahr die Assistentin einen Schreibtisch bekommen hat.
T-initial;OV: *Letztes Jahr die Assistentin hat einen Schreibtisch bekommen.
V2;VO: *Letztes Jahr hat die Assistentin bekommen einen Schreibtisch.
T-final;VO: *Letztes Jahr die Assistentin bekommen einen Schreibtisch hat.
T-initial;VO: *Letztes Jahr die Assistentin hat bekommen einen Schreibtisch.

19. ID: *präsentieren*

V2;OV: Am Sonntag hat die Künstlerin ein Bild präsentiert.
T-final;OV: *Am Sonntag die Künstlerin ein Bild präsentiert hat.
T-initial;OV: *Am Sonntag die Künstlerin hat ein Bild präsentiert.
V2;VO: *Am Sonntag hat die Künstlerin präsentiert ein Bild.
T-final;VO: *Am Sonntag die Künstlerin präsentiert ein Bild hat.
T-initial;VO: *Am Sonntag die Künstlerin hat präsentiert ein Bild.

20. ID: *hoeren*

V2;OV: Plötzlich hat der Musiker eine Melodie gehört.
T-final;OV: *Plötzlich der Musiker eine Melodie gehört hat.
T-initial;OV: *Plötzlich der Musiker hat eine Melodie gehört.
V2;VO: *Plötzlich hat der Musiker gehört eine Melodie.

T-final;VO: *Plötzlich der Musiker gehört eine Melodie hat.
T-initial;VO: *Plötzlich der Musiker hat gehört eine Melodie.

21. ID: *diskutieren*

V2;OV: Am Montag hat der Nachbar mit dem Arzt diskutiert.
T-final;OV: *Am Montag der Nachbar mit dem Arzt diskutiert hat.
T-initial;OV: *Am Montag der Nachbar hat mit dem Arzt diskutiert.
V2;VO: *Am Montag hat der Nachbar diskutiert mit dem Arzt.
T-final;VO: *Am Montag der Nachbar diskutiert mit dem Arzt hat.
T-initial;VO: *Am Montag der Nachbar hat diskutiert mit dem Arzt.

22. ID: *bauen*

V2;OV: Im Kindergarten hat das Kind einen Turm gebaut.
T-final;OV: *Im Kindergarten das Kind einen Turm gebaut hat.
T-initial;OV: *Im Kindergarten das Kind hat einen Turm gebaut.
V2;VO: *Im Kindergarten hat das Kind gebaut einen Turm.
T-final;VO: *Im Kindergarten das Kind gebaut einen Turm hat.
T-initial;VO: *Im Kindergarten das Kind hat gebaut einen Turm.

23. ID: *anrufen*

V2;OV: In der Pause hat der Koch seinen Bruder angerufen.
T-final;OV: *In der Pause der Koch seinen Bruder angerufen hat.
T-initial;OV: *In der Pause der Koch hat seinen Bruder angerufen.
V2;VO: *In der Pause hat der Koch angerufen seinen Bruder.
T-final;VO: *In der Pause der Koch angerufen seinen Bruder hat.
T-initial;VO: *In der Pause der Koch hat angerufen seinen Bruder.

24. ID: *schreien*

V2;OV: Gestern Abend hat die Tochter ihre Mutter angeschrien.
T-final;OV: *Gestern Abend die Tochter ihre Mutter angeschrien hat.
T-initial;OV: *Gestern Abend die Tochter hat ihre Mutter angeschrien.
V2;VO: *Gestern Abend hat die Tochter angeschrien ihre Mutter.
T-final;VO: *Gestern Abend die Tochter angeschrien ihre Mutter hat.
T-initial;VO: *Gestern Abend die Tochter hat angeschrien ihre Mutter.

25. ID: *reparieren*

V2;OV: Letzte Woche hat der Mechaniker das Auto repariert.
T-final;OV: *Letzte Woche der Mechaniker das Auto repariert hat.

T-initial;OV: *Letzte Woche der Mechaniker hat das Auto repariert.
V2;VO: *Letzte Woche hat der Mechaniker repariert das Auto.
T-final;VO: *Letzte Woche der Mechaniker repariert das Auto hat.
T-initial;VO: *Letzte Woche der Mechaniker hat repariert das Auto.

26. ID: *essen*

V2;OV: Abends hat der Sportler die Pizza gegessen.
T-final;OV: *Abends der Sportler die Pizza gegessen hat.
T-initial;OV: *Abends der Sportler hat die Pizza gegessen.
V2;VO: *Abends hat der Sportler gegessen die Pizza.
T-final;VO: *Abends der Sportler gegessen die Pizza hat.
T-initial;VO: *Abends der Sportler hat gegessen die Pizza.

27. ID: *kuessen*

V2;OV: Am Abend hat die Frau den Gärtner geküsst.
T-final;OV: *Am Abend die Frau den Gärtner geküsst hat.
T-initial;OV: *Am Abend die Frau hat den Gärtner geküsst.
V2;VO: *Am Abend hat die Frau geküsst den Gärtner.
T-final;VO: *Am Abend die Frau geküsst den Gärtner hat.
T-initial;VO: *Am Abend die Frau hat geküsst den Gärtner.

28. ID: *schlagen*

V2;OV: Wahrscheinlich hat der Chef einen Arbeiter geschlagen.
T-final;OV: *Wahrscheinlich der Chef einen Arbeiter geschlagen hat.
T-initial;OV: *Wahrscheinlich der Chef hat einen Arbeiter geschlagen.
V2;VO: *Wahrscheinlich hat der Chef geschlagen einen Arbeiter.
T-final;VO: *Wahrscheinlich der Chef geschlagen einen Arbeiter hat.
T-initial;VO: *Wahrscheinlich der Chef hat geschlagen einen Arbeiter.

29. ID: *toeten*

V2;OV: Gestern hat der Jäger einen Tiger getötet.
T-final;OV: *Gestern der Jäger einen Tiger getötet hat.
T-initial;OV: *Gestern der Jäger hat einen Tiger getötet.
V2;VO: *Gestern hat der Jäger getötet einen Tiger.
T-final;VO: *Gestern der Jäger getötet einen Tiger hat.
T-initial;VO: *Gestern der Jäger hat getötet einen Tiger.

30. ID: *fliegen*

V2;OV: Letztes Jahr ist die Professorin nach Japan geflogen.
T-final;OV: *Letztes Jahr die Professorin nach Japan geflogen ist.
T-initial;OV: *Letztes Jahr die Professorin ist nach Japan geflogen.
V2;VO: *Letztes Jahr ist die Professorin geflogen nach Japan.
T-final;VO: *Letztes Jahr die Professorin geflogen nach Japan ist.
T-initial;VO: *Letztes Jahr die Professorin ist geflogen nach Japan.

31. ID: *fahren*

V2;OV: Im Sommer ist der Manager nach Italien gefahren.
T-final;OV: *Im Sommer der Manager nach Italien gefahren ist.
T-initial;OV: *Im Sommer der Manager ist nach Italien gefahren.
V2;VO: *Im Sommer ist der Manager gefahren nach Italien.
T-final;VO: *Im Sommer der Manager gefahren nach Italien ist.
T-initial;VO: *Im Sommer der Manager ist gefahren nach Italien.

32. ID: *laufen*

V2;OV: Manchmal ist die Großmutter in die Stadt gelaufen.
T-final;OV: *Manchmal die Großmutter in die Stadt gelaufen ist.
T-initial;OV: *Manchmal die Großmutter ist in die Stadt gelaufen.
V2;VO: *Manchmal ist die Großmutter gelaufen in die Stadt.
T-final;VO: *Manchmal die Großmutter gelaufen in die Stadt ist.
T-initial;VO: *Manchmal die Großmutter ist gelaufen in die Stadt.

33. ID: *stehen*

V2;OV: Im Urlaub ist der Trainer am Meer gestanden.
T-final;OV: *Im Urlaub der Trainer am Meer gestanden ist.
T-initial;OV: *Im Urlaub der Trainer ist am Meer gestanden.
V2;VO: *Im Urlaub ist der Trainer gestanden am Meer.
T-final;VO: *Im Urlaub der Trainer gestanden am Meer ist.
T-initial;VO: *Im Urlaub der Trainer ist gestanden am Meer.

34. ID: *sitzen*

V2;OV: Manchmal ist die Sängerin auf einem Stuhl gesessen.
T-final;OV: *Manchmal die Sängerin auf einem Stuhl gesessen ist.
T-initial;OV: *Manchmal die Sängerin ist auf einem Stuhl gesessen.
V2;VO: *Manchmal ist die Sängerin gesessen auf einem Stuhl.

T-final;VO: *Manchmal die Sängerin gesessen auf einem Stuhl ist.
T-initial;VO: *Manchmal die Sängerin ist gesessen auf einem Stuhl.

35. ID: *liegen*

V2;OV: Morgens ist der Hund auf dem Bus gelegen.
T-final;OV: *Morgens der Hund auf dem Bus gelegen ist.
T-initial;OV: *Morgens der Hund ist auf dem Bus gelegen.
V2;VO: *Morgens ist der Hund gelegen auf dem Bus.
T-final;VO: *Morgens der Hund gelegen auf dem Bus ist.
T-initial;VO: *Morgens der Hund ist gelegen auf dem Bus.

36. ID: *rennen*

V2;OV: Vorgestern ist das Mädchen in die Schule gerannt.
T-final;OV: *Vorgestern das Mädchen in die Schule gerannt ist.
T-initial;OV: *Vorgestern das Mädchen ist in die Schule gerannt.
V2;VO: *Vorgestern ist das Mädchen gerannt in die Schule.
T-final;VO: *Vorgestern das Mädchen gerannt in die Schule ist.
T-initial;VO: *Vorgestern das Mädchen ist gerannt in die Schule.

A.8.4 Experimental items of Experiment 9

1. ID: *vater*

T-final;OV: Der Nachbar weiß, dass der Vater ein Auto repariert hat.
T-initial;OV: *Der Nachbar weiß, dass der Vater hat ein Auto repariert.
T-final;VO: *Der Nachbar weiß, dass der Vater repariert ein Auto hat.
T-initial;VO: *Der Nachbar weiß, dass der Vater hat repariert ein Auto.

2. ID: *junge*

T-final;OV: Der Großvater bestätigt, dass der Junge ein Flugzeug gebaut hat.
T-initial;OV: *Der Großvater bestätigt, dass der Junge hat ein Flugzeug gebaut.
T-final;VO: *Der Großvater bestätigt, dass der Junge gebaut ein Flugzeug hat.
T-initial;VO: *Der Großvater bestätigt, dass der Junge hat gebaut ein Flugzeug.

3. ID: *schueler*

T-final;OV: Die Techniker bemerken, dass der Schüler die Maschine benutzt hat.
T-initial;OV: *Die Techniker bemerken, dass der Schüler hat die Maschine benutzt.
T-final;VO: *Die Techniker bemerken, dass der Schüler benutzt die Maschine hat.
T-initial;VO: *Die Techniker bemerken, dass der Schüler hat benutzt die Maschine.

4. ID: *taenzerin*

T-final;OV: Der Taxifahrer denkt, dass die Tänzerin eine Freundin getroffen hat.
T-initial;OV: *Der Taxifahrer denkt, dass die Tänzerin hat eine Freundin getroffen.
T-final;VO: *Der Taxifahrer denkt, dass die Tänzerin getroffen eine Freundin hat.
T-initial;VO: *Der Taxifahrer denkt, dass die Tänzerin hat getroffen eine Freundin.

5. ID: *studentin*

T-final;OV: Die Professoren glauben, dass die Studentin das Experiment durchgeführt hat.
T-initial;OV: *Die Professoren glauben, dass die Studentin hat das Experiment durchgeführt.
T-final;VO: *Die Professoren glauben, dass die Studentin durchgeführt das Experiment hat.
T-initial;VO: *Die Professoren glauben, dass die Studentin hat durchgeführt das Experiment.

6. ID: *baecker*

T-final;OV: Der Koch erfährt, dass der Bäcker das Brot gebracht hat.
T-initial;OV: *Der Koch erfährt, dass der Bäcker hat das Brot gebracht.
T-final;VO: *Der Koch erfährt, dass der Bäcker gebracht das Brot hat.
T-initial;VO: *Der Koch erfährt, dass der Bäcker hat gebracht das Brot.

7. ID: *tochter*

T-final;OV: Die Mutter sieht, dass die Tochter eine Zeitung gelesen hat.
T-initial;OV: *Die Mutter sieht, dass die Tochter hat eine Zeitung gelesen.
T-final;VO: *Die Mutter sieht, dass die Tochter gelesen eine Zeitung hat.
T-initial;VO: *Die Mutter sieht, dass die Tochter hat gelesen eine Zeitung.

8. ID: *kapitaen*

T-final;OV: Der Fischer behauptet, dass der Kapitän mit dem Schiff gefahren ist.
T-initial;OV: *Der Fischer behauptet, dass der Kapitän ist mit dem Schiff gefahren.
T-final;VO: *Der Fischer behauptet, dass der Kapitän gefahren mit dem Schiff ist.
T-initial;VO: *Der Fischer behauptet, dass der Kapitän ist gefahren mit dem Schiff.

9. ID: *politiker*

T-final;OV: Der Politiker erfährt, dass die Familie in der Stadt gelebt hat.
T-initial;OV: *Der Politiker erfährt, dass die Familie hat in der Stadt gelebt.
T-final;VO: *Der Politiker erfährt, dass die Familie gelebt in der Stadt hat.
T-initial;VO: *Der Politiker erfährt, dass die Familie hat gelebt in der Stadt.

10. ID: *arbeiter*

T-final;OV: Die Ehefrau bemerkt, dass der Arbeiter den Hammer vergessen hat.
T-initial;OV: *Die Ehefrau bemerkt, dass der Arbeiter hat den Hammer vergessen.

T-final;VO: *Die Ehefrau bemerkt, dass der Arbeiter vergessen den Hammer hat.
T-initial;VO: *Die Ehefrau bemerkt, dass der Arbeiter hat vergessen den Hammer.

11. ID: *koenig*

T-final;OV: Der Journalist weiß, dass der König einen Löwen getötet hat.
T-initial;OV: *Der Journalist weiß, dass der König hat einen Löwen getötet.
T-final;VO: *Der Journalist weiß, dass der König getötet einen Löwen hat.
T-initial;VO: *Der Journalist weiß, dass der König hat getötet einen Löwen.

12. ID: *soldat*

T-final;OV: Der Präsident bestätigt, dass der Soldat nach Indien geflogen ist.
T-initial;OV: *Der Präsident bestätigt, dass der Soldat ist nach Indien geflogen.
T-final;VO: *Der Präsident bestätigt, dass der Soldat geflogen nach Indien ist.
T-initial;VO: *Der Präsident bestätigt, dass der Soldat ist geflogen nach Indien.

13. ID: *lehrer*

T-final;OV: Die Eltern vermuten, dass der Lehrer die Kinder geschlagen hat.
T-initial;OV: *Die Eltern vermuten, dass der Lehrer hat die Kinder geschlagen.
T-final;VO: *Die Eltern vermuten, dass der Lehrer geschlagen die Kinder hat.
T-initial;VO: *Die Eltern vermuten, dass der Lehrer hat geschlagen die Kinder.

14. ID: *polizist*

T-final;OV: Der Dieb vermutet, dass der Polizist durch das Haus gelaufen ist.
T-initial;OV: *Der Dieb vermutet, dass der Polizist ist durch das Haus gelaufen.
T-final;VO: *Der Dieb vermutet, dass der Polizist gelaufen durch das Haus ist.
T-initial;VO: *Der Dieb vermutet, dass der Polizist ist gelaufen durch das Haus.

15. ID: *musiker*

T-final;OV: Die Tante denkt, dass der Musiker eine Gitarre gekauft hat.
T-initial;OV: *Die Tante denkt, dass der Musiker hat eine Gitarre gekauft.
T-final;VO: *Die Tante denkt, dass der Musiker gekauft eine Gitarre hat.
T-initial;VO: *Die Tante denkt, dass der Musiker hat gekauft eine Gitarre.

16. ID: *sportler*

T-final;OV: Der Trainer erfährt, dass der Sportler durch den Wald gerannt ist.
T-initial;OV: *Der Trainer erfährt, dass der Sportler ist durch den Wald gerannt.
T-final;VO: *Der Trainer erfährt, dass der Sportler gerannt durch den Wald ist.
T-initial;VO: *Der Trainer erfährt, dass der Sportler ist gerannt durch den Wald.

17. ID: *katze*

T-final;OV: Die Mädchen glauben, dass die Katze den Kuchen gegessen hat.
T-initial;OV: *Die Mädchen glauben, dass die Katze hat den Kuchen gegessen.
T-final;VO: *Die Mädchen glauben, dass die Katze gegessen den Kuchen hat.
T-initial;VO: *Die Mädchen glauben, dass die Katze hat gegessen den Kuchen.

18. ID: *pilot*

T-final;OV: Die Stewardess sieht, dass der Pilot eine Jacke angezogen hat.
T-initial;OV: *Die Stewardess sieht, dass der Pilot hat eine Jacke angezogen.
T-final;VO: *Die Stewardess sieht, dass der Pilot angezogen eine Jacke hat.
T-initial;VO: *Die Stewardess sieht, dass der Pilot hat angezogen eine Jacke.

19. ID: *priester*

T-final;OV: Der Onkel behauptet, dass der Priester eine Zigarette geraucht hat.
T-initial;OV: *Der Onkel behauptet, dass der Priester hat eine Zigarette geraucht.
T-final;VO: *Der Onkel behauptet, dass der Priester geraucht eine Zigarette hat.
T-initial;VO: *Der Onkel behauptet, dass der Priester hat geraucht eine Zigarette.

20. ID: *mechaniker*

T-final;OV: Die Ärztin vermutet, dass der Mechaniker ein Bier getrunken hat.
T-initial;OV: *Die Ärztin vermutet, dass der Mechaniker hat ein Bier getrunken.
T-final;VO: *Die Ärztin vermutet, dass der Mechaniker getrunken ein Bier hat.
T-initial;VO: *Die Ärztin vermutet, dass der Mechaniker hat getrunken ein Bier.

A.8.5 Filler items

1. ID: *ws1*, match
   S1: Groß ein gehabt lange Blume mit sind.
   S2: Groß ein gehabt lange Blume mit sind.

2. ID: *ws2*, match
   S1: Das kleine mit Seite der kann beide.
   S2: Das kleine mit Seite der kann beide.

3. ID: *ws3*, match
   S1: Lieben alle neuen von Universität Apfel Haus.
   S2: Lieben alle neuen von Universität Apfel Haus.

4. ID: *ws4*, match
   S1: Frühling lassen immer mehr auf dich Himmel mit.
   S2: Frühling lassen immer mehr auf dich Himmel mit.
5. ID: *ws5*, mismatch
   S1: Teller auf das mittel am langsam gibst.
   S2: Teller auf das anders am langsam gibst.
6. ID: *ws6*, mismatch
   S1: Rote kann schnell Musik gestern.
   S2: Rote darfst schnell Musik gestern.
7. ID: *f1*, mismatch
   S1: Der Schüler rennt nicht zu einem anderen Bahnhof.
   S2: Der Schüler rennt nicht zu einem kleinen Bahnhof.
8. ID: *f2*, mismatch
   S1: Der Onkel tanzt mit seiner netten Sekretärin.
   S2: Der Mann tanzt mit seiner netten Sekretärin.
9. ID: *f3*, mismatch
   S1: Der Doktor antwortet nicht auf den lieben Brief.
   S2: Der Doktor reagiert nicht auf den lieben Brief.
10. ID: *f4*, mismatch
    S1: Der Ausländer wartet nicht auf den späten Zug.
    S2: Der Ausländer wartet auch auf den späten Zug.
11. ID: *f5*, mismatch
    S1: Der Lehrer sitzt in einem schönen Büro.
    S2: Der Lehrer sitzt vor einem schönen Büro.
12. ID: *f6*, mismatch
    S1: Der Präsident lebt nicht in einer fremden Stadt.
    S2: Der Präsident lebt nicht in der fremden Stadt.
13. ID: *f7*, mismatch
    S1: Der Junge schreibt an seine traurige Tante.
    S2: Der Junge schreibt an seine geliebte Tante.
14. ID: *f8*, mismatch
    S1: Der Kranke bleibt vielleicht in einem großen Krankenhaus.

S2: Der Verletzte bleibt vielleicht in einem großen Krankenhaus.

15. ID: *f9*, mismatch
    S1: Peter, Jan oder Anne stellt die Gläser auf den Tisch.
    S2: Peter, Jan oder Julia stellt die Gläser auf den Tisch.
16. ID: *f10*, mismatch
    S1: Martin hat ein Auto und Max auch.
    S2: Martin hat ein Kind und Max auch.
17. ID: *f11*, mismatch
    S1: Niemand versteht, ob Michael die Prüfung geschafft hat.
    S2: Niemand versteht, ob Michael eine Prüfung geschafft hat.
18. ID: *f12*, mismatch
    S1: Wir können fragen, ob wir die Katze mit nach Hause nehmen können.
    S2: Wir können besprechen, ob wir die Katze mit nach Hause nehmen können.
19. ID: *f13*, mismatch
    S1: Du hat versprochen, dass wir uns im Urlaub sehen werden.
    S2: Du hat versprochen, dass wir euch im Urlaub sehen werden.
20. ID: *f14*, mismatch
    S1: Der kleine Hund ist umgefallen und alle haben gelacht.
    S2: Der schwarze Hund ist umgefallen und alle haben gelacht.
21. ID: *f15*, mismatch
    S1: Peter kann die Lampe reparieren, die er kaputt gemacht hat.
    S2: Peter muss die Lampe reparieren, die er kaputt gemacht hat.
22. ID: *f16*, mismatch
    S1: Ein großer Vogel ist gestern gegen das Fenster geflogen.
    S2: Ein großer Vogel ist gestern an das Fenster geflogen.
23. ID: *f17*, mismatch
    S1: Niemand weiß wer die ganzen Kekse aufgegessen hat
    S2: Niemand weiß wer die ganzen Kekse weggegessen hat
24. ID: *f18*, mismatch
    S1: Ich habe gehört, dass Maria nächstes Jahr heiraten wird.
    S2: Ich habe gehört, dass Maria dieses Jahr heiraten wird.

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