Gender assignment and gender agreement in adult bilinguals and second language learners of French

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This paper is concerned with gender marking in adult French. Four groups of subjects are compared: German-French simultaneous bilinguals (2L1ers) who grew up in France, German-French 2L1ers who grew up in Germany, advanced second language learners (L2ers) who are resident either in France or in Germany at the time of testing. The major goal of the study is to investigate whether differences in input conditions (acquisition in a minority vs. a majority language context) and differences in age of onset affect gender assignment and gender agreement in the same way or differently. Furthermore, we investigate whether successful acquisition of gender is dependent on influence from German. Two experiments, an acceptability judgment task and an elicited production task, are carried out. Results show successful acquisition of agreement in all groups. By contrast, gender assignment may be mildly affected if French is acquired in a minority language context or as an L2.

Keywords: gender, French, simultaneous bilingualism

1. Introduction

The present study investigates gender marking in French across two groups of learners each of which divide into two sub-groups. We tested adult German-French simultaneous bilinguals (henceforth 2L1ers) who have lived in either France or Germany during childhood and adolescence. These are compared with second language learners of French (henceforth L2ers) with German as their L1 who lived in either France or Germany at the time of testing.

The rationale (detailed below) for comparing the two sub-groups of 2L1ers is to investigate the role, if any, of the dominant language of the environment during childhood and adolescence for the acquisition of French. The rationale for cross-comparing 2L1ers and L2ers is based on the assumption that both groups make similar errors with respect to inflectional morphology in their weaker (or 'heritage') language (e.g., Håkansson, 1995; Montrul, Foote, & Perpiñán, 2008) — a plausible assumption given that both groups are subject to influence from another (dominant) language.[1]

In this study we also re-examine potential differences between the two types of learners, comparing acquisition outcomes in morpho-syntax (gender agreement) with acquisition outcomes in the lexicon (gender assignment). We observe that both 2L1ers and L2ers have no problems with morpho-syntactic properties, while some lexical aspects of gender marking in French may not be acquired if the acquisition of French from birth has occurred in a minority language context or as an L2.

It has often been pointed out that the speech of adult bilingual speakers is subject to relatively more variation when compared to the speech of monolingual speakers. As possible reasons for such variation, studies on bilingual child development indicate that the amount and type of exposure plays a crucial role (e.g., Gathercole, 2007; Gathercole & Thomas, 2005; Pearson, Fernandez, Lewedeg, & Oller, 1997; Unsworth, 2013). As a bilingual child's input space is divided between two languages, the child is exposed to less input in any of the two languages compared to a monolingual. This reduced input is claimed to mostly impact the minority language, leaving the majority language untouched (Agyri & Sorace, 2007, for syntax-pragmatics interface and narrow syntax in English-Greek bilinguals; Gathercole & Thomas, 2009, for syntax and lexicon in English-Welsh bilinguals).

Studies on *adult bilingualism* tie in with these ideas and have, so far, mostly focused on the 'weaker' or 'heritage' language. The language corresponding to the stronger (or 'dominant') language of the society has received far less attention; it seems to be taken for granted that competence in the stronger language develops just as in monolinguals. But clearly, if the input space of bilinguals counts as divided and provided that acquisition is not entirely independent of the amount of input, then both languages of the bilingual should be affected, unless and until it is possible for bilinguals to 'catch up' in their language development at some point later in life.

With regard to the question of which linguistic domains are affected (or not) by reduced amount of exposure, or to what extent they are affected, it is plausible to assume that the lexicon is more vulnerable than morpho-syntactic aspects of acquisition. After all, there is empirical evidence that acquisition of the lexicon of the minority language is affected by reduced input (see Pearson et al., 1997 for a

relevant case study and an overview). This holds despite the existence of linguistic milestones, including the *vocabulary spurt*, suggesting that input quantity is less important than a language learners' changing ability to make use of it. In stark contrast to the assumption that the lexicon is affected by reduced input, the mor- pho- syntactic development of bilinguals has been argued to follow the same patterns as in monolinguals. Bilingual children pass through the same developmental stages and make the same type of errors as monolingual children (see e.g., De Houwer, 1995 for an overview).

A comparison between the acquisition of morpho-syntax and the lexicon can also inform different theoretical views on the process of L2 acquisition. We assume here that access to Universal Grammar (UG) does not deteriorate with age (e.g., White, 1989; Schwartz & Sprouse, 1996). This does not exclude morphological variability in L2ers altogether. Rather, variability is caused by production and performance limitations, which need not imply representational deficits (Prévost & White, 2000; White, Valenzuela, Kozlowsaka-MacGregor, & Leung, 2004). Under the assumption of UG access in L2 acquisition, it is plausible that performance in morpho-syntax is subject to less variation than performance in the lexicon because the acquisition of morpho-syntax (being guided by UG) is relatively less sensitive to frequency of exposure than the acquisition of the lexicon (not being guided by UG).

We further assume that gender assignment is to some extent rule-based and driven by statistical learning mechanisms (Saffran, Aslin, & Newport, 1996) in L1 and (possibly) L2 acquisition. This assumption implies that gender assignment differs across nouns with respect to correctness because for some nouns assignment follows certain statistical patterns, while for others assignment runs counter to (or contradicts) such patterns implying that rules have to be learnt item-by-item. If statistical learning is subject to input frequency — which we deem plausible —, L2ers who are residents of the L2 country (and therefore have more exposure to the language, and more occasions to use it) should perform relatively better with respect to the lexicon than non-resident L2ers.

One might object that German-French data is apparently irrelevant to test whether L2 learners have access to UG. After all, both languages have grammatical gender as a parametrized option. Hence, or so one might reason, it must be ruled out that relevant knowledge is *not* simply owed to L1 transfer. Relatedly, Meisel (2009) and Granfeldt, Schlyter, and Kihlstedt (2007) have shown that gender assignment and agreement represent *major* acquisition problems for L2 learners, even if their L1 *has* gender. So, if learners could 'simply transfer,' this data would yet have to be explained. Nevertheless, to rule out that gender marking is based on L1 transfer, we also compare domains in which German and French differ with

regard to gender marking. Should the objection be justified, these domains should be particularly prone to error.

The current state of the art leads us to ask the following questions:

i.   If there are differences in gender marking between 2L1ers depending on whether they grew up in France or in Germany, do these differences occur in both assignment and agreement of gender?

ii. If there are differences in gender marking between 2L1ers and L2ers, do these differences occur in both assignment and agreement?

iii. Are learners more successful in gender marking when the noun follows assignment rules of French, as compared to nouns that contradict these rules? What is the role of assignment rules in 2L1 and L2 acquisition?

iv. Can each instance of correct gender marking in French be reasonably explained as influenced by knowledge of the German language?

Section 2 introduces gender marking in French and German; Section 3 reviews extant literature on the acquisition of grammatical gender in French and outlines the research questions and predictions of the current study. Section 4 presents elicited production and acceptability judgment data from the two groups of French-German simultaneous bilinguals and the two groups of L2 French learners, discussing also to what extent successful acquisition of gender marking can be attributed to cross-linguistic influence. Section 5 forwards conclusions.

2.   Gender assignment and gender agreement

Gender is a parametrized option, realized only in some languages. In languages with grammatical gender, it is an invariable lexical property of the noun. Nouns are assigned gender in the lexicon, while other elements such as determiners and adjectives receive gender through agreement with the noun. Following Carstens (2000), agreement within the DP requires that the noun enter into a head/head or specifier/head relation with the adjective and the determiner. In this configuration, the noun's interpretable features can check the corresponding uninterpretable features on the determiner and the adjective.

Languages with gender differ in terms of the principles governing gender assignment. Some languages have semantically-based gender assignment rules, where nouns are assigned to a gender according to their membership to semantic fields and natural sex (e.g., English). In other languages, gender is assigned predominantly on the basis of formal aspects of the noun. No language exists with a purely formal gender assignment system.

According to Corbett (1991, pp. 49, 59), French and German have a combination of semantic and formal gender assignment rules, but not all scholars agree with this view. For French, Tucker, Lambert, and Rigault (1977) demonstrated that noun endings are important indicators of grammatical gender, but some grammarians continue to claim that gender assignment is arbitrary, at least for inanimate nouns (see Lyster, 2006 for an excellent overview of the debate). Moreover, those accepting the rule-based view have different opinions about the nature of these rules, specifically the question of whether morphological and phonological rules can be properly distinguished. We assume here that gender assignment in French is to some extent rule-based, and we differentiate phonological, morphological, and semantic assignment rules, following previous proposals in the literature.

2.1 Gender in French

French has feminine and masculine gender, e.g., *fauteuil*$_M$ 'armchair' vs. *table*$_F$ 'table'. Nouns are distributed unequally between the two genders: 61% are masculine and 39% are feminine (Tucker et al., 1977, p. 47). Determiners, adjectives, some quantifiers, and past participles receive their gender through agreement with the noun. The following examples show agreement with adjectives in attributive (1) and predicative (2) positions.

(1) a. un/le$_M$ fauteuil$_M$ blanc$_M$
         'a/the white armchair'
     b. une/la$_F$ table$_F$ blanche$_F$
         'a/the white table'

(2) a. Le$_M$ fauteuil$_M$ est blanc$_M$.
         'The armchair is white.'
     b. La$_F$ table$_F$ est blanche$_F$.
         'The table is white.'

Unlike in (1) and (2), gender marking in French is not always overtly visible and/or audible. While most singular articles are reliable indicators of nominal gender, gender distinctions are not marked on the plural articles *les* and *des* (e.g., *les/des fauteuils*$_M$ 'the/some armchairs' vs. *les/des tables*$_F$ 'the/some tables'). Moreover, nouns with initial vowels or *h muet* are subject to *élision* (e.g., *l'armoire* 'the closet'). Some adjectives are invariable in spoken and written French, such as *rouge* 'red' in (3). Other adjectives are variable in written French, while gender marking is inaudible in spoken French, as in *joli/e* 'pretty' in (4).

(3) a. le$_M$ fauteuil$_M$ rouge [ʁuːʒ]
         'the red armchair'

    b.   la$_F$ table$_F$ rouge [ʁuːʒ]
        'the red table'

(4) a.   le$_M$ joli$_M$ [ʒoliː] fauteil$_M$
          'the pretty armchair'
     b.   la$_F$ joli**e**$_F$ [ʒoliː] table$_F$
          'the pretty table'

There are different cues to determine nominal gender in French. These are related to semantic and formal (morphological and phonological) properties of the noun. According to the natural gender rule, sex-differentiable nouns denoting males are masculine, while sex-differentiable nouns denoting females are feminine (Corbett, 1991, p. 57). There are, however, exceptions to these rules, e.g., *sentinelle*$_F$ 'guard' is assigned feminine gender, but traditionally refers to a man. Most nouns denoting animals are not covered by these rules either. For instance, the feminine noun *mouffette*$_F$ 'skunk' can refer to a male or a female. Other rules are based on the noun's association with particular semantic fields, as illustrated in Table 1. Again,

Table 1. Semantic assignment rules in French (based on Grevisse, 1993: 705ff)

Semantic field	Associated gender	Example
Colors	masculine	*rouge* 'red'
Sciences	feminine	*chimie* 'chemistry'
Elements / metals	masculine	*soufre / fer* 'sulfur / iron'
Languages	masculine	*russe* 'Russian'
Months / days	masculine	*mars / lundi* 'March / Monday'
Trees	masculine	*chêne* 'oak'
Fruit	feminine	*poire* 'pear'

Table 2. Suffixes and associated gender in French

Suffix	Associated gender	Examples
-age	masculine	*fromage* 'cheese', voyage 'journey'
-ment	masculine	*développement* 'development', *appartement* 'apartment'
-eur	masculine	*bonheur* 'luck', *voleur* 'thief'
-ier	masculine	*encrier* 'ink pot', *chevalier* 'knight'
-ette	feminine	*vedette* 'star', *poussette* 'baby buggy'
-té	feminine	*publicité* 'advertisement', *éternité* 'eternity'
-elle	feminine	*tourelle* 'little tower', *poubelle* 'trash can'
-ion	feminine	*persuasion* 'persuasion', *action* 'action'

Table 3. Gender by final sound (cf. Corbett, 1991: 59, examples added)

final sound	Number of nouns	% Masculine	Examples
/œ̃/	17	100	*parfum* 'perfume'
/ã/	1963	99.3	*vent* 'wind'
/ɛ̃/	938	99.0	*patin* 'ice skate'
/ø/	189	97.4	*nœd* 'node'
/o/	865	97.2	*pot* 'pot'
/ʒ/	1453	94.2	*orage* 'storm'
/m/	1406	91.9	*poème* 'poem'
/ɛ/	625	90.2	*mai* 'May'
/z/	612	10.0	*blouse* 'blouse'

there are exceptions; for example, while most fruit are feminine (Grevisse, 1993), *citron* 'lemon' and *kiwi* 'kiwi' are masculine.

Morphological rules are mostly associated with suffixes; *-age* and *-ment* are indicative of masculine gender, while *-ette* and *-té* represent distinctive endings of feminine nouns (Dubois, 1965, pp. 61ff; Tucker et al., 1977, p. 12; Lyster, 2006: 85, 87). Further examples for morphological rules are provided in Table 2.

It has further been shown that there is a strong correlation between particular noun-final sounds and nominal gender. Phonemic predictors of masculine gender include mostly vocalic phonemes, while phonemic predictors of feminine gender include only consonantal phonemes (Lyster, 2006, p. 74). These rules are probabilistic, some being more reliable than others. Table 3 shows some examples of relatively reliable rules (associated with one gender in more than 90% of all cases).

The issue of phonological cues for assignment has been discussed controversially. For example, it has been proposed that not only the final, but also the initial sound of a word may influence the gender distinction (Tucker, Lambert, Rigault, & Segalowitz, 1968), and that penultimate and antepenultimate phonemes need to be considered as well (Tucker et al., 1977, p. 62). Moreover, the separation of formal cues into morphological and phonological is not always clear-cut. For example, in the case of bi-syllabic nouns like *logement*$_M$, it is unclear whether the suffix *-ment* or the nasal ending triggers the association with masculine gender.

Finally, gender assignment rules are at times not only unreliable, but can also conflict with one another. For example, *femme* 'woman' and *maman* 'mother' are feminine due to the natural gender rule, but most nouns ending in /m/ and /ã/ are masculine according to phonological rules. That is, in these two cases, the natural gender rule overrules phonological rules. Another example is the noun *rose*, referring to the color 'pink'. It should be feminine according to the phonological rule

for nouns ending in /z/, but since it belongs to the semantic field of colors it is assigned masculine gender. Ayoun (2010) draws attention to further complications resulting from homophones and multiple orthographies (the latter being relevant for learners with predominantly written input).

Overall, French displays a combination of formal and semantic rules controlling gender assignment. However, one cannot expect learners to perform in an entirely native-like manner on the basis of rule-knowledge alone. Additional experience is needed with those lexemes that form exceptions to the rules. We assume that these have to be learnt in an item-based fashion.

2.2 Gender in German

German has three genders: feminine, masculine, and neuter. 50% of German nouns are masculine, while 30% are feminine and 20% neuter (Bauch, 1971). Gender is marked on different types of determiners, relative pronouns, question pronouns, as well as on attributive adjectives, which receive gender via agreement. Examples of DPs with different genders are provided in (5). Some articles with different genders (and cases) are homophonous, e.g., the indefinite articles in (5a,c). All following examples are given in nominative case.

(5)   a. $ein_{M/N}$ $interessanter_M$ $Film_M$
      b. $eine_F$ $interessante_F$ $Zeitung_F$
      c. $ein_{M/N}$ $interessantes_N$ $Buch_N$

Gender marking interacts with case and definiteness. Unlike in French, attributive adjectives in definite DPs do not show gender distinctions (except in accusative singular):

(6)   a. der_M $interessante_{M/F/N}$ $Film_M$
      b. die_F $interessante_{M/F/N}$ $Zeitung_F$
      c. das_N $interessante_{M/F/N}$ $Buch_N$
      'the interesting movie/newspaper/book'

Predicative adjectives in German are not marked for gender either:

(7)   a. Der_M $Film_M$ ist $interessant_{M/F/N}$.
      b. Die_F $Zeitung_F$ ist $interessant_{M/F/N}$.
      c. Das_N $Buch_N$ ist $interessant_{M/F/N}$.
      'The movie/newspaper/book is interesting.'

As for assignment, gender can be predicted for a large proportion of German nouns (Corbett, 1991, p. 49), but they involve a complex interplay of semantic, morphological, and phonological factors, and there is disagreement in the literature as to

which type of rule dominates (cf. Köpcke, 1982, p. 11 and Lang, 1976, p. 64 for different views). Semantic rules exist, but they are unreliable and need not coincide with those found in French, as most nouns are assigned arbitrarily to semantic fields. For example, all months and seasons are masculine, basic numbers are feminine, and metals are neuter (Köpcke, 1982, pp. 71ff). Animate referents are often referred to as being feminine or masculine, while inanimate referents may receive any of the three genders (Mills, 1986, pp. 23ff). However, there are counterexamples: The nouns *Mädchen*$_N$ 'girl' and *Fräulein*$_N$ 'miss' receive gender according to the morphological rule which associates the suffixes *-chen* and *-lein* with neuter gender (see below).

As in French, certain suffixes indicate nominal gender. For instance, *-ung*, *-heit*, *-schaft*, and *-keit* are characteristic of feminine gender, *-chen* and *-lein* are associated with neuter gender, and *-ling* and *-rich* are distinctive to masculine gender (Hoeppner, 1980, pp. 120ff). Köpcke (1982, pp. 81ff) proposed a complex rule system for the genders associated with the phonological endings of monosyllabic German nouns (see also Mills, 1986; Szagun, Stumper, Sondag, & Franik, 2007), but, as in French, these rules are probabilistic and there are many exceptions to them.

To sum up, although German has different types of assignment rules, like French, the two languages have no rules in common other than the natural gender rule and, perhaps coincidentally, some semantic rules. Second, German has neuter gender, which is absent in French. Third, both languages have agreement but also cases in which gender agreement does not apply or is not audible: In French, gender is inaudible on plural articles and some adjectives, while German makes no gender distinction with adjectives in predicative positions and in definite marked DPs (except in the accusative singular case). In short: Although German has gender, this may be of little help in the acquisition of gender marking in French (see also Meisel, 2009, p. 29 for similar observations on German children acquiring L2 French).

3. Acquisition of gender

3.1 Monolingual and bilingual acquisition in children

It has been frequently demonstrated that the acquisition of gender is unproblematic in L1 acquisition. Most evidence comes from spontaneous data, where articles or other determiners are taken as indicators of gender marking (but research differs in terms of whether the article is considered to be an indicator of gender *assignment* or *agreement*). The age at which children stop producing gender mismatches between article and noun differs across languages. French- and Italian-learning children seem to make close to no mistakes (Clark, 1985; Kupisch, Müller, &

Cantone, 2002), while German-learning children below age three occasionally select an article inconsistent with the noun's gender (e.g., Mills, 1986; Müller, 1990; Szagun et al., 2007).[2] Children acquiring Dutch, a language with hardly any cues to gender assignment, need even more time until they stop overgeneralizing *de* with neuter nouns (e.g., Blom, Polišenska, & Weerman, 2008; Cornips & Hulk, 2008; Orgassa & Weermann, 2008). It is therefore reasonable to assume that cue strength differs across languages and that the order in which rules are acquired depends on the predictive power of these rules: The greater the scope of the rule and the lower the number of exceptions, the earlier this rule will be acquired (Mills, 1986).

For French, Tucker et al. (1977) have shown that children ranging in age between seven and 17 years used morpho-phonological cues to determine nominal gender of pseudo words. Karmiloff-Smith (1979) demonstrated that this is true even for much younger children. French-speaking children as young as three years old were able to determine the gender of pseudo words based on phonological cues. When natural gender cues and phonological cues conflicted, there was a tendency to rely on phonological cues (see also Levy, 1983 for Hebrew; Mills, 1986 for German; Rodina & Westergaard, 2012 for Russian). Szagun et al. (2007) found that three-year-old monolingual German children performed better on nouns following assignment rules than on nouns not following assignment rules, and that they acquired phonological assignment rules before morphological and semantic ones. In summary, gender is acquired early in languages which display some transparency in their assignment system, as is the case for French and (to a lesser extent) German, and they show sensitivity to assignment rules from an early age.

Similar to monolingual acquisition, research into the acquisition in simultaneous bilingual children has shown correct gender marking and sensitivity to gender cues from a very early age in languages with transparent gender cues. For example, between the ages of 2;1 and 2;3, German-Spanish bilingual children exhibit approximately 90% accuracy in gender marking in Spanish, with no significant differences in accuracy with respect to monolingual children (Kuchenbrandt, 2005, p. 1260). German-French bilingual children acquire most definite and indefinite articles in both languages around age 2;6, using definite articles in French with accuracy rates around 95% before the age of three years (Koehn, 1994; Müller, 1990, 1999). For Swedish-French bilinguals, error rates in French range around 6–8% at ages three to four (Granfeldt, 2005). Article-noun mismatches can be somewhat higher if French is acquired as the weaker language (Kupisch et al., 2002). In both German and French, gender marking tends to be less accurate on indefinite than on definite articles (Müller, 1990). Typically, the masculine/neuter form *ein* (German) and the masculine form *un* (French) are overused, possibly as a result of their relatively high token frequency (French *un* is homophonous with the numeral).

There is evidence that bilingual children acquire formal assignment rules prior to the age of three years and that they make the same types of developmental errors as their monolingual peers. Recall that nasal endings are commonly associated with masculine gender, with the exception of a few frequent nouns, such as *maman*$_\text{F}$ 'mother' and *main*$_\text{F}$ 'hand'. Müller (1999, pp. 378–379) and Kupisch et al. (2002, p. 338) report instances of incorrect article use with the latter type of nouns; this is indeed expected if phonological assignment rules have been acquired. It is remarkable that such errors occur even with nouns that are subject to natural gender rules, such as *maman*. Hence, there seem to be qualitative similarities in the acquisition of gender in monolingual and bilingual children, even if the two groups may show quantitative differences (see Kupisch et al., 2002).

In Dutch, where the acquisition of gender is more protracted (gender cues being more limited), bilingual children produce similar errors as monolingual children (e.g., Cornips & Hulk, 2008; De Houwer, 1990). Nevertheless, while monolingual children eventually acquire the target system, it is unclear whether bilingual children ever proceed beyond this stage of overgeneralization. Since gender has to be acquired in an item-based fashion in Dutch, the relevant factor for successful acquisition is likely to be amount of exposure rather than age of onset (see Unsworth, 2013, and Unsworth, Argyri, Cornips, Hulk, Sorace, & Tsimpli, 2011). This may be similar for those nouns in French that are not covered by gender assignment rules.

3.2 Gender marking in adult bilinguals

In contrast to child bilinguals, some adult bilinguals show incomplete acquisition or attrition in the domain of gender marking (see Håkansson, 1995 for Swedish; Montrul et al., 2008 for Spanish; Polinsky, 2008 for Russian). A pertinent case study is Håkansson's (1995) study of nominal morphology in five Swedish simultaneous bilinguals who lived in the United States or France and moved to Sweden by age 20, where they attended a course of Swedish as a second language. While they were target-like in producing V2-structures (error rates between 0% and 3%), they encountered difficulties in producing gender agreement on DPs (error rates between 35% and 68%). Problems with gender agreement were also observed by Montrul et al. (2008), who compared gender agreement in heritage speakers and L2 learners of Spanish. Both groups made more errors than the monolingual controls, and performance differed according to the type of task: Heritage learners outperformed L2 learners in the oral task (90% vs. 72%), while L2 learners performed better in the comprehension-based written tasks. However, Montrul and colleagues' study did not only include simultaneous, but also successive bilinguals.

Bianchi (forthcoming) investigated gender agreement on past participles in the Italian of German-Italian 2L1ers and L2ers. All learners showed native-like performance in gender agreement. By contrast, gender assignment differed depending on exposure to Italian and type of noun: Only 2L1ers who grew up in Italy showed ceiling performance, while 2L1ers who grew up in Germany performed on par with L2ers of German. The same group of 2L1ers was tested with respect to gender marking in German (Stöhr, Akpınar, Bianchi, & Kupisch, 2012). Again, there was a discrepancy between gender assignment and agreement, but, this time, only for 2L1ers who grew up in Italy (and L2ers). Both studies suggest that gender agreement is relatively unproblematic in L2 acquisition as well as in 2L1 acquisition and maintenance, while gender assignment causes problems, especially when nouns do not follow assignment rules.

Håkansson's (1995) and Montrul et al.'s (2008) results, indicating that gender agreement is vulnerable in 2L1 speakers, appear to contradict findings on child bilinguals. There could be various reasons for this contrast. First, most studies on child bilingualism are based on naturalistic data, while at least Montrul et al.'s study is based on experimental data. Second, research with small children tends to focus on the production of the appropriate article, while adjective and participle agreement are not considered (due to the scarcity of occurrences). Third, children use a smaller range of nouns; therefore, the risk of making mistakes is smaller. Finally, most studies on child bilingualism originate in a European context, while studies on bilingual adults often originate in a North American context. Possibly, the participants' input conditions in the heritage language (and their socio-economic status) differ in previous studies on the two continents, which challenges a clear interpretation of the results. Languages like German, French, Spanish, and Russian can often be learnt as foreign languages in European schools and contact with these languages is facilitated through geographical vicinity. It therefore remains controversial whether gender is a vulnerable domain in bilingual acquisition.

3.3 Gender marking in L2 learners

Comparisons between bilingual children and adult learners of French have demonstrated higher error rates for the latter (e.g., Granfeldt, 2005). Moreover, there appears to be consensus that gender marking causes persistent problems for L2ers, especially, but not only, when the L1 does not mark gender. Relevant studies for L2 French have been provided by Carroll (1989) and Hawkins and Franceschina (2004) (both L1 English), Bartning (2000) and Granfeldt (2005) (both L1 Swedish), Dewaele and Véronique (2001) (L1 Dutch), and Meisel (2009) (child learners, L1 German). However, there is an ongoing debate on whether such problems imply representational deficits or not (see White et al., 2004, for the latter view).

Based on a review of relevant acquisition studies of gender in French, Carroll (1989) argues that Anglophone L2ers of French (both adults and students with late immersion) have great difficulty learning to properly produce French gender marking. She assumes that the absence of gender marking in the L1 determines the possibility of representing a gender feature of nouns in the L2; and if the inherent (interpretable) gender feature of the noun cannot be acquired, this has implications for gender agreement as well. Hawkins and Francheschina (2004) also argue that gender cannot be acquired in the L2 if it is not present in the L1, but they relate problems to the absence of the uninterpretable gender feature in the L1 (and, consequently, in the interlanguage L2), the effect being that feature checking cannot take place.

While Carroll's (1989) and Hawkins and Franceschina's (2004) accounts imply fundamental differences between L1 and L2 acquisition, White et al. (2004) have argued that problems with gender marking should be attributed to production and performance limitations, but do not imply a representational deficit.

Finally, note that mistakes in gender marking can have two different sources: Learners may assign the wrong gender to the noun, but nevertheless realize agreement on adjectives and other modifiers, e.g., *le_M voiture$_M$ vert$_M$ (the car green). Or, they may assign gender correctly to the noun but fail to realize agreement on the modifiers (e.g., *le_M voiture$_F$ vert$_M$). As the examples show, the two cases are superficially indistinguishable, and there are studies in which the determiner was counted as an indicator of assignment as well as studies in which it was counted as an indicator of agreement. Therefore, accuracy and error rates across studies do not necessarily refer to the same phenomenon. Despite the overall impression that gender is a problematic category in adult L2 acquisition (and perhaps child L2 acquisition), while being unproblematic in 2L1 acquisition (at least in the stronger language), one should keep in mind that conflicting results may, at least partially, result from differences in methodology and the populations studied.[3]

3.4 Research questions

Our study investigates the role of the acquisition context with regard to lexical and morpho- syntactic aspects of grammatical gender. Under the assumption that the acquisition of the lexicon is more sensitive to input frequency than the acquisition of morpho-syntax in both 2L1 and L2 acquisition, both types of learners are expected to be more successful with gender agreement than with gender assignment. Moreover, if learners are sensitive to statistical regularities in the input, they should be more successful with nouns following assignment rules than with nouns contradicting these rules. For L2 acquisition, we follow the idea of UG access, which implies that advanced L2ers and 2L1ers show qualitative similarities in morpho-syntactic

aspects in gender marking. We further assume that gender acquisition is driven by statistical learning mechanisms in both 2L1 and L2 acquisition.

This motivates the following four research questions:

i.   If there are differences in gender marking between 2L1ers depending on whether they grew up in France or Germany, do these differences occur in both assignment and agreement of gender?

ii. If there are differences in gender marking between 2L1ers and L2ers, do these differences occur in both assignment and agreement?

iii. Are 2L1 and L2 learners more successful in gender marking when the noun follows assignment rules of French, as compared with nouns that contradict these rules?

iv. Can each instance of correct gender marking in French be reasonably explained as influenced by knowledge of German?

Particularly with regard to question (iv), we will investigate aspects of gender assignment and gender agreement in which French and German differ, showing that cross-linguistic influence alone cannot explain the L2ers' success.

4.   Study on gender assignment and agreement

4.1 Participants and overall procedure

Four groups participated in this study: early German-French bilinguals (2L1) who grew up in France (n = 10), early German-French bilinguals (2L1) who grew up in Germany (n = 11), and German learners of L2 French in France (n = 11) and in Germany (n = 8). Participants were between the ages of 18 and 46 years old (mean age 29;6).

The 2L1ers were all tested in Germany. The 10 participants who grew up predominantly in France had moved to Germany as adults and seven of them had never lived in any German-speaking country during the first 19 years of their lives (the three exceptions had spent 19%, 22%, and 49% of their first 19 years in Germany). After the age of 19, participants in this group had lived between six months and 20 years in Germany (mean: 8.5 years). Among the 11 2L1ers who grew up predominantly in Germany, eight had never lived in France during the first 19 years of their lives (the three exceptions had spent 30%, 33%, and 49% of their first 19 years in a French-speaking country). After that period, they have spent between no time and two years in France. Most 2L1ers have regularly spent their holidays in Germany if they are residents in France, or vice versa.

Table 4. Overview of participants

	2L1ers, French as stronger language	2L1ers, French as weaker language	L2ers in France	L2ers in Germany
No. of subjects	10	11	11	8
Age range	24–41 (33.2)	20–42 (26.7)	27–45 (35.5)	22–41 (35.5)
Cloze test score	89.1%	72.3%	81.6%	75.8%
Country of residence	Germany	Germany	France	Germany
predominant country of residence before age 19	France	Germany	Germany	Germany

In order to determine the 2L1ers' more proficient language, we examined their self- reported preferred language, their performance in a written cloze-test in both languages (see Table 4) as well as their perceived foreign accent (Kupisch, Barton, Hailer, Lein, & Stangen, 2011).[4] Except for the aforementioned two bilinguals who had lived about the same time in both countries, and who were very balanced, the country of residence during childhood was clearly predictive of the language in which the 2L1ers were more proficient and felt more at ease. We will therefore assume that the 2L1ers who grew up in France speak French as their stronger (first) language, while those who grew up in Germany speak French as their weaker (first) language.[5]

The L2ers, all advanced speakers of French, grew up in monolingual German environments and their first contact with the L2 had occurred after the age of 11 years.[6] They were recruited in France and Germany, depending on their country of residence at the time of testing. Those tested in Germany had spent between no time and 12 years in France (mean 2.8 years), and those tested in France had been living there between 5 weeks and 19 years (mean 6.6 years). As suggested by the results of the cloze test, at least in their written French, they were very proficient and more at ease than the 2L1ers with French as their weaker language.

4.2 Acceptability Judgment Task

4.2.1 *Structure of the test and procedure*

The Acceptability Judgment Task (henceforth AJT) contained 36 items testing for gender marking.[7] Participants saw and heard a sentence appearing in yellow on a black screen. They were asked to orally repeat the sentence if they thought it sounded acceptable and to correct it if they thought it sounded wrong. The purpose of the double sensory perception was to ensure that bilinguals with relatively less formal schooling in French were not disadvantaged. Response time was

limited to approximately three times the length of the sentence spoken by a native speaker. The test took about 45 minutes and the items were randomized anew for each participant. Answers were recorded and transcribed.

Test items consisted of 18 preselected nouns preceded by definite articles embedded in a sentence. Each noun appeared twice in the test: once with an attributive adjective (e.g., (8a)) and once with a predicative one (e.g., (8b)).

(8) a. *Le_M $poule_F$ $astucieux_M$ sait voler.
         'The smart hen can fly.'
     b. *Le_M $poule_F$ qui a trouvé les graines est $astucieux_M$.
         'The hen which found the grains is smart.'

These pairs were both either grammatical or ungrammatical. This was done for two reasons: The first was to control that corrections were not made due to learning effects. For example, if a learner does not know the gender of *poule* 'hen', he is likely to accept no matter which article precedes; for example, he might incorrectly accept le_M *poule*. If he hears *poule* for the second time, now preceded by la_F, he might correct *la* to *le* because having previously heard *poule* with a masculine article. The second reason was to reveal potential differences in agreement between attributive and predicative structures. Recall that German adjectives do not show differential gender marking in predicative positions. Furthermore, we assume that agreement is more difficult with predicative than with attributive adjectives because the linear distance between adjective and noun is longer, thus increasing working memory load.

In total, 50% of the items were grammatical and 50% ungrammatical. For the ungrammatical items, the gender was manipulated on both the article and the adjective (e.g., *la_F $platane_M$ $vieille_F$ 'the old sycamore'). The nouns were selected according to whether the nouns represented semantic, morphological, and phonological assignment rules, 50% being masculine and 50% being feminine. Items testing knowledge of semantic assignment rules represented the natural gender rule (e.g., $poule_F$ 'hen'), the semantic field of fruit (feminine in French; e.g., $poire_F$ 'pear'), and that of trees (masculine in French; e.g., $platane_M$ 'sycamore'). Items representing morphological rules included nouns ending in $-age_M$ for masculine gender (e.g., $décollage_M$ 'takeoff') and *-ette* for feminine (e.g., $vedette_M$ 'star'). Items representing phonological rules contained nouns ending in /œ̃/ and /ɛ̃/ for masculine (e.g., $parfum_M$ 'perfume', $patin_M$ 'ice skate') and in /z/ and /ʃ/ for feminine gender (e.g., $blouse_F$ 'blouse', $cruche_F$ 'jar').

Note that some nouns obeyed phonological and semantic rules at the same time, or phonological and morphological rules. For example, *décollage* 'takeoff' should be masculine because *-age* is associated with masculine gender, but also because word-final /ʒ/ is associated with masculine gender; *vache* should be

feminine because it refers to a female, but also because /ʃ/ is associated with feminine gender.[8]

In addition to nouns obeying gender assignment rules in French, we also included nouns that contradicted these rules or represented conflicting cues. For example, *laideron*$_M$ 'ugly girl' follows phonological rules but conflicts with the natural gender rule; *rose*$_M$ 'pink' follows semantic rules, colors being masculine, but conflicts with phonological rules, as /z/ is associated with feminine gender. To test for cross-linguistic influence, we used nouns with the same gender in German and French, as in (9a), as well as nouns with different genders in German and French, as in (9b).

(9) a. Le *décollage*$_M$ de l'avion était fascinant. (German: Start$_M$ 'takeoff')
         'The takeoff was fascinating.'
     b. Le *voyage*$_M$ avec Pierre était merveilleux. (German: Reise$_F$ 'trip')
         'The trip with Pierre was marvelous.'

Following Dewaele and Véronique (2001, p. 283), articles were taken as indicators of gender assignment and adjectives as instances of agreement. When calculating assignment, we excluded all item pairs with inconsistent gender marking on the article, as one could argue that in these cases the learner has not assigned any gender to the nouns.[9] Item pairs showing consistent assignment were counted as non-target-like when the article was marked with the wrong gender both times, and as target-like when the article was marked with the correct gender both times. For agreement, we determined for each single item (including DPs with inconsistent assignment) whether the article was marked with the same gender as the adjective (correct agreement) or not (incorrect agreement).
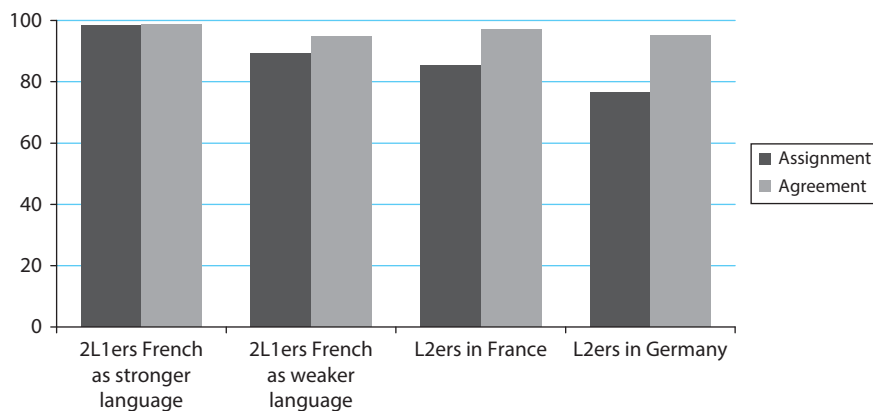

Figure 1. Gender assignment and agreement in the AJT (accuracy in %)

4.2.2 *Results*

As shown in Figure 1, all subject groups performed in a native-like manner (accuracy 95% or above, when rounded) in terms of agreement. By contrast, ceiling performance in assignment was attained only by the bilinguals who grew up in France.

For gender assignment in the AJT a one-way ANOVA indicated a significant difference between the groups, $F(3, 36) = 5.012$, $p = 0.005$. Bonferroni ($p = 0.003$) and Tukey ($p = 0.003$) post-hoc tests indicated that a significant difference exists only between the bilinguals with French as the stronger language and the L2ers in Germany. Another one-way ANOVA showed no significant difference among the groups for gender agreement in the AJT, $F(3,36) = 1.530$, $p = 0.223$. A repeated-measures ANOVA for the AJT found that the L2ers in Germany were significantly better in agreement ($M = 94.88$) than in assignment ($M = 76$), $F(1, 7) = 10.469$, $p = 0.014$. The same held true for the L2ers in France ($M = 96.82$ for agreement vs. $M = 85.09$ for assignment), $F(1, 10) = 16.264$, $p = 0.002$. However, no difference could be found between the assignment and agreement scores from the AJT in the 2L1ers with French as the weaker language, $F(1, 10) = 1.648$, $p = 0.228$. The same was true for the 2L1ers with French as the stronger language, $F(1, 9) = 0.083$, $p = 0.78$.

4.3 Elicited Production Task

One may assume that L2ers of French have an advantage over 2L1ers in AJTs, because this type of task, even if timed, is relatively more likely to make the learner access metalinguistic knowledge. To uncover potential advantages of one group over another, we created an additional task, which involved more spontaneous language production.

4.3.1 *Procedure and design*

The Elicited Production Task (henceforth EPT) consisted of 18 items following (or not) different rules of assignment, 50% representing masculine gender and 50% feminine gender. Again, some items had the same gender in German, while others differed in gender.

In this task, participants were presented a series of PowerPoint slides, each showing between two and three objects. Participants were asked to describe every object in the picture together with a word describing 'what the object is like', i.e., with an adjective. For example, they were shown a picture of a red and a green strawberry, reading and hearing the question *Que vois-tu?* 'What do you see?'. In this case, the appropriate answer would have been *une*$_F$ *fraise rouge et une*$_F$ *fraise verte*$_F$ 'a red strawberry and a green strawberry'. The following slide would then

show only the red strawberry and the participants were asked *Que manque-t-il?* 'What is missing?'. The question elicited a DP with a definite article, in this case *la*$_F$ *fraise verte*$_F$ 'the green strawberry'.

For the analysis, only DPs with definite articles were taken into account (but see further below for a comparison of definite and indefinite DPs). Occasionally, participants used adjectives that had no audible gender marking (e.g., *marron*$_{M/F}$ instead of *brun*$_M$/*brune*$_F$). In this case, the DP was not counted for agreement but only for assignment. If a participant was uncertain about a word or gave an unexpected noun (e.g., *vase* 'vase' instead of *cruche* 'jar'), the experimenter named the noun without revealing the gender, saying, e.g., *Ce que tu vois s'appelle cruche* 'What you are seeing is called jar'. The participants were then asked to restart the task for this item. In order to distract the participants from the gender task, they were asked after a couple of slides to repeat all the items they had seen in the previous pictures, making them believe they were performing a memory task. Again, answers were recorded and transcribed later.

4.3.2 *Results*

Overall, performance in this task was better than in the AJT, likely due to the selection of items: The test items in the EPT had to be representable by means of pictures, which limited the choice to relatively more well-known items. If 95% accuracy is taken as native-like, all groups can be considered native-like in both assignment and agreement (see Figure 2).

A one-way ANOVA was conducted for the EPT to determine whether a significant difference existed in gender assignment and gender agreement among the four groups. No significant difference could be found either for gender assignment, $F(3, 36) = 2.017$, $p = 0.129$, or for gender agreement between the groups,
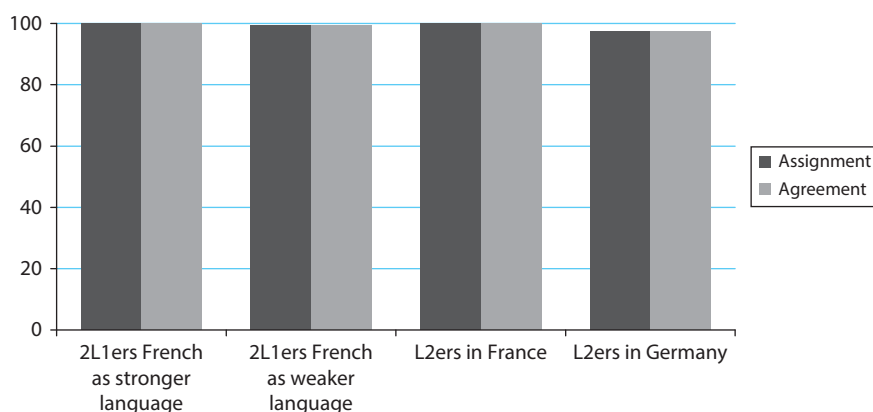

Figure 2. Gender assignment and agreement in the EPT (accuracy in %)

$F(3, 36) = 1.033$, $p = 0.389$. Repeated-measure ANOVAs showed that there were no within-group effects for gender assignment and agreement, $F(1, 7) = 0.059$, $p = 0.815$ for the L2ers tested in Germany; $F(1, 10) = 0.101$, $p = 0.758$ for the L2ers tested in France; $F(1, 10) = 4.231$, $p = 0.067$ for the French weak 2L1ers; and $F(1,9) = 0.00$, $p = 1.00$ for the French dominant 2L1ers. Looking at the individual items, the only noun problematic for the 2L1ers in terms of assignment was *mouffette*$_F$, for which the object was pictured together with the icons for male (♂) and female (♀) to elicit *la mouffette masculine* 'the male skunk'. The noun *mouffette* is likely to be less frequent than the other nouns tested in both experiments, as it is the only one not listed in the *Micro Robert Poche* dictionary; additionally, it may have caused problems because skunks are not local (i.e., European) animals. For the L2ers, incorrect assignment occurred with a greater variety of items (*visage* 'face', *nuage* 'cloud', *vache* 'cow').

Overall, the AJT indicated visible differences between assignment and agreement for both groups of L2ers but not for the 2L1ers. Group comparisons show no significant contrasts in agreement, while differences in assignment occurred only between the 2L1ers with French as their stronger language and the L2ers in Germany. Due to ceiling performance, the EPT showed no differences, neither across groups, nor within groups between assignment and agreement.

4.4 The acquisition of assignment rules

For the following analysis, each noun was classified in terms of whether it allowed for assignment based on phonological, morphological or semantic cues, a combination thereof, as well as whether it could be seen as an exception to any of the rules. For example, *sentinelle*$_F$ 'guard' was counted as an exception to semantic rules, as it was used in a context making clear that the noun referred to a male person (see (10)); at the same time, however, the suffix *-elle* cues feminine gender.

(10)   *La sentinelle* qui s'appelle Pierre Rigot est toujours très *courageuse*.
         'The guard whose name is Pierre Rigot is always very courageous.'

While cues for *sentinelle* exemplify a clash of rules, cues for the noun *fraise* [frɛz] 'strawberry' could strengthen one another because /z/ is associated with feminine gender and fruits are generally feminine.

Figure 3 and Table 5 illustrate the results of this analysis, showing performance with nouns that involve different types of cues, combinations thereof, or exceptions to them.

Although the results of all four groups broken down by rule type vary, they show a clear trend indicating that exceptions to semantic rules were most difficult for all groups. 2L1ers with French as their stronger language only show problems
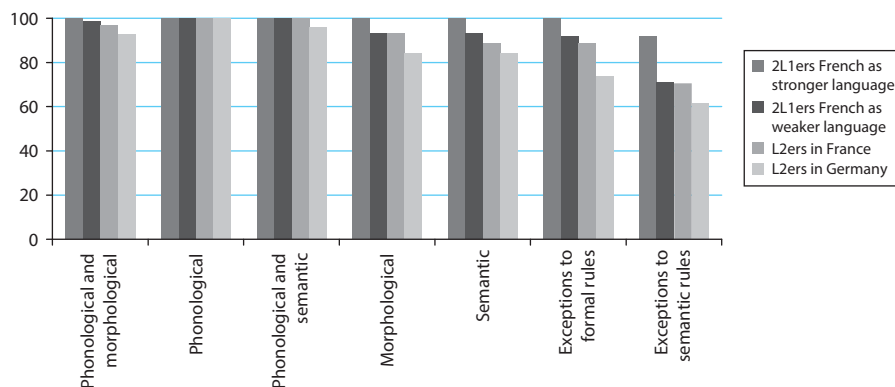
Figure 3. Assignment with nouns according to gender cues (accuracy in %)

Table 5. Assignment with nouns according to gender cues (accuracy in %)

Type of rules	2L1ers, French as stronger language		2L1ers, French as weaker language		L2ers in France		L2ers in Germany	
	M (%)	SD	M (%)	SD	M (%)	SD	M (%)	SD
Phonological & morphological	100	0.0	98.5	5.1	96.9	14.6	92.9	6.9
phonological	100	0.0	100	0.0	100	0.0	100	0.0
Phonological & semantic	100	0.0	100	0.0	100	11.7	95.9	0.0
Morphological	100	0.0	93.2	16.2	93,2	18.6	84.4	11.7
Semantic	100	0.0	93.0	9.4	88.6	5. 8	84.3	6.8
Exceptions to formal rules	100	0.0	91.6	20.8	88.6	25.0	74.0	13.1
Exceptions to semantic rules	92.5	12.1	67.6	30.8	70.6	30.6	61.6	32.3

with exceptions to semantic rules. 2L1ers with French as their weaker language performed at ceiling only when phonological rules were involved; their performance drops below 95% when solely morphological or semantic cues are involved, and below 70% with semantic exceptions. A similar trend can be observed in both L2 groups, L2ers tested in Germany being less accurate.

Overall, results show that all four subject groups performed very well (and predominantly native-like) with nouns of predictable gender, which can be taken to imply that they have acquired the properties of gender assignment in French. All groups experienced difficulties with the same type of items, albeit to different extents.

4.5 The role of cross-linguistic influence from German

We have seen thus far that if there were differences between 2L1ers and L2ers, these occurred in gender assignment. Moreover, if there were differences in acquisition outcomes between assignment and agreement, agreement was acquired more successfully. So, it appears that formal aspects of the language can be fully acquired, even with a more limited amount of input, and even after the onset of puberty.

As mentioned previously, gender features can either be activated in a language or not. Since our learners had the advantage that both of their first languages exhibit grammatical gender, and provided that the parameterization relevant for gender marking happens before age 2;0 in L1 acquisition (Meisel, 2009, p. 26), one could argue that the results do not reveal anything about the learners' ability to acquire gender marking at an advanced age, since L2ers may simply use their L1 grammar to deal with gender in the L2. However, if this is true, one should be able to observe language influence in those aspects where German and French differ.

To exclude this possibility, we further analyzed the data, focusing on aspects of gender marking that differ in German and French (see Section 2). In addition to finding out whether or not the language has grammatical gender, learners of French have to (i) discover the rules governing gender assignment and learn which nouns do not conform to these rules, and (ii) determine under what conditions agreement must be marked. We present two analyses to establish the extent to which our participants were influenced by their knowledge of German.

4.5.1 *Cross-linguistic influence in gender assignment*
Figure 4 shows the combined results for gender assignment from the AJT and EPT, comparing performance with nouns having the same gender in German and French (gender-matched) and nouns which differ in gender in German and French (non gender-matched). Taking all four groups together, a repeated-measures ANOVA showed that influence from German played a significant role. More problems occurred when a noun's gender was different ($M = 90.38$) in the two languages than when it was the same ($M = 95.73$), $F(1, 39) = 21.171$, $p < 0.001$. Looking at the different groups individually, only the L2ers of French in Germany and the 2L1 French-dominant group showed no significant difference between gender-matched and non gender-matched items, $F(1, 7) = 4.846$, $p = 0.064$, and $F(1, 9) = 3.857$, $p = 0.081$, respectively. The two remaining groups showed a significant contrast (L2 France: $F(1, 10) = 5.465$, $p = 0.042$; 2L1 German-dominant: $F(1, 10) = 9.679$, $p = 0.011$).

Note, however, that correct assignment remained higher than 80% for most subjects, including cases in which the genders of the French noun and its German
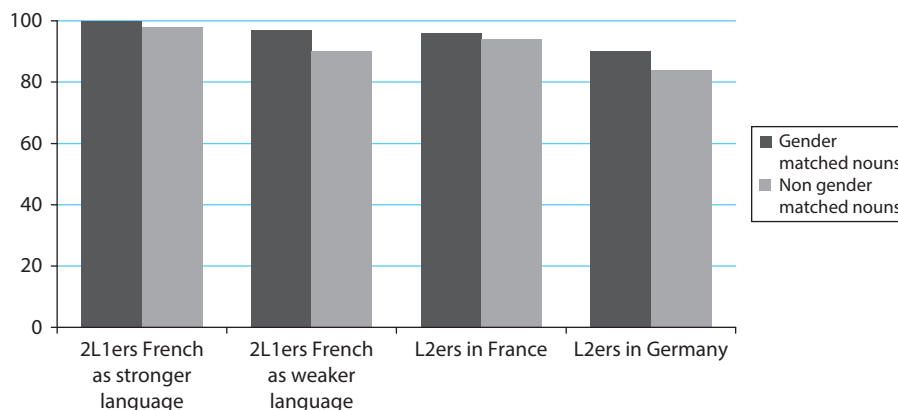
Figure 4. Comparison of assignment, gender-matched vs. non gender-matched nouns (accuracy in %)

equivalent differed. Therefore, even if influence from German to French does exist, this cannot be the sole reason why our subjects were successful in marking gender in French. The nouns that were marked incorrectly most often were *platane*$_M$[10] 'sycamore', *moufette*$_F$ 'skunk', and *laideron*$_M$ 'ugly girl', of which the latter two present the additional difficulty of a clash between semantic and formal cues. In short, cross-linguistic influence from German is visible in assignment, but should not be overstated.

4.5.2 *Cross-linguistic influence in gender agreement*

Under the assumption that cross-linguistic influence between German and French exists, one could further predict that it is easier for German-French bilinguals to mark agreement on adjectives in attributive positions than on adjectives in predicative positions because German does not show gender agreement on the latter (see (7)). To pursue this idea, we compared accuracy in adjective agreement in these two positions based on the AJT. As Figure 5 shows, all groups, including the L2ers, performed only marginally better when the adjective was in attributive position. Repeated-measure ANOVAs proved that the four groups did not show a within-group difference in terms of attributive vs. predicative adjective placement (L2 Germany: $F(1, 7) = 2.321$, $p = 0.171$; L2 France: $F(1, 10) = 0.1$ $p = 0.758$; 2L1 French weak: $F(1, 10) = 2.573$, $p = 0.140$; 2L1 French dominant: $F(1, 9) = 3.819$, $p = 0.082$).

One could further ask whether gender agreement is more problematic in definite than in indefinite marked DPs. As shown in (6) and (7), German definite DPs in the nominative case do not show gender marking on the adjective (unlike indefinite DPs). So, under the influence of German, learners might resort to the default masculine form more often when producing definite DPs. Recall that the
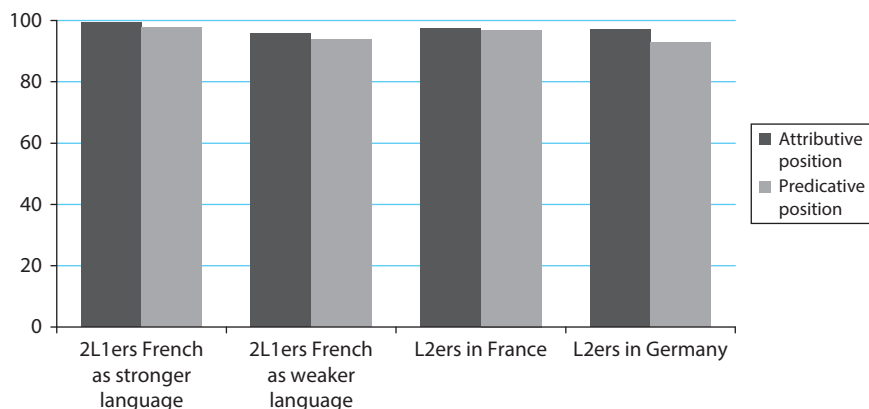
Figure 5. Agreement in attributive vs. predicative positions (accuracy in %)

EPT elicited definite and indefinite DPs, which facilitates comparison of incorrect agreement in these two types of DPs. In fact, contrary to what is expected under influence from German, there were more agreement mismatches with indefinite DPs (n = 8) than with definite ones (n = 4). The former cases involved mostly over-use of the masculine form of the adjective (6/8), while the latter involved only overuse of the feminine form (4/4), suggesting that learners did not resort to the masculine from by default, as is often assumed.

In sum, it is unlikely that language influence can explain our participants' high performance as compared with previous studies with adult 2L1ers and L2ers. If correct gender marking were due to influence from German alone, one would have expected less accuracy in assigning gender to non gender-matched nouns, and more problems with agreement when the adjective was in predicative position and when the DP was definite. Results reveal mild influence from German in assignment, but no influence in agreement.

5. Summary and conclusions

We have investigated gender marking in two groups of bilinguals, one with French as the stronger language (who had grown up predominantly in France) and one with French as the weaker language (who had grown up predominantly in Germany), with two groups of L2 speakers of French differing in terms of their country of residence at the time of testing.

Our first question was whether differences exist in gender marking between the 2L1 groups, depending on where they grew up. In the AJT, the 2L1ers with French as their dominant language scored higher than those with French as their

weaker language, but no level of significance was reached. The two groups performed alike in the EPT; we suspect because the nouns elicited here were (with one exception) well known and frequent and the task therefore too easy to bring about any contrasts.

For the 2L1ers, these results suggest that with reduced but consistent exposure to a language during childhood and adolescence, gender agreement will not be negatively affected, while gender assignment may be (mildly) affected in a minority-language context. The incidence of incorrect gender assignment errors is low, however, and does not imply that rules for gender assignment have not been acquired. Rather, 2L1ers may encounter problems when nouns do not follow assignment rules. Furthermore, results indicate that gender marking is not affected by a decrease of input during adulthood, as witnessed by the 2L1ers who had moved to Germany as adults.

Our second question concerned potential differences in gender marking between 2L1ers and advanced L2 speakers of French. Assuming that UG access does not deteriorate with age, we expected differences to be more visible in gender assignment, which is more sensitive to frequency of exposure than gender agreement. Our assumptions were borne out: 2L1ers and L2ers showed no significant differences in gender agreement, while differences in assignment were significant in the AJT between French-dominant 2L1ers (the group with the most exposure to French) and L2ers in Germany (the group with the least exposure to French).

Our third question was whether learners are more successful in gender marking when nouns follow assignment rules of French, as compared with nouns that contradict these rules. All learner groups showed similar error patterns: Learners tended to be most successful in assigning the correct gender to a noun when the noun followed assignment rules, while they tended to encounter problems with nouns involving conflicting cues and exceptions to assignment rules. Results allow for the conclusion that the ability to acquire gender assignment rules in French does not suffer from reduced input; neither does it deteriorate with age.

Finally, we explored whether each instance of correct gender marking in French can reasonably be explained in terms of influence from German. We have argued that successful agreement marking in French cannot be solely explained through influence from an(other) L1, in this case German, which features a gender marking system. Although the L2ers tested in Germany and the 2L1ers with French as their dominant language showed an advantage in assignment when nouns had the same gender in German and French, we failed to find any negative influence with adjective agreement in definite DPs and in predicative positions, where German adjectives are not marked for gender. All groups were equally successful in gender agreement with predicative and attributive adjectives and with indefinite and definite DPs, which speaks against German influence in gender agreement.

Our results are in line with those of Bianchi (forthcoming) and Stöhr et al. (2012), who show that gender agreement is not subject to incomplete acquisition in 2L1 acquisition, not even in the weaker language. As mentioned previously, our 2L1 participants with French as their weaker language do not match the type of minority-language or 'heritage' speakers commonly portrayed in the literature, as they were fluent and (mostly) active users of the minority language and this may explain that our results contradict those of previous studies with adult bilinguals. Finally, the fact that there were qualitative similarities between 2L1 and L2ers — i.e., with respect to differences between assignment and agreement and error patterns in assignment — appears to be inconsistent with the assumption of a sensitive period for the acquisition of gender, as suggested by Meisel (2009) and supported by Granfeldt et al.'s (2007) study on early L2ers.

Notes

1. The heritage language is often defined as being acquired as a minority language within a majority language environment through naturalistic exposure in the home context (Rothman, 2007, p. 360, Rothman, 2009, p. 156). Studies on bilingualism in the European contexts have often used the term 'weaker language' instead (e.g., Schlyter, 1993).

2. Although they tend to pass through a stage during which they produce so-called fillers or proto-determiners, which are morphologically underdetermined (Bottari, Cipriani, & Chilosi, 1993/94).

3. There is also literature on the processing of gender in French, showing different effects for early and late bilinguals with L1 English (e.g., Guillelmon & Grosjean, 2001), but these are beyond the scope of the present paper.

4. The French cloze-test was kindly made available to us by Annie Tremblay, to whom we express our gratitude (see Tremblay, 2011). The German cloze-test was modeled after the French one.

5. Since the participants of the present study include simultaneous bilinguals who have acquired French as a minority language in Germany, mostly through their parents at home, they fulfill Rothman's (2009) definition of heritage speakers. Nevertheless, they do not match the type of heritage speakers commonly depicted in the literature because they are all fluent and (mostly) active language users of the heritage language, and some of them attended a German-French bilingual school in Germany, thus having a variety of input sources of French. Some even had explicit instruction in French.

6. Recent work has suggested sensitive periods for the ages around 4 years and 7 years (this includes the one relevant for gender). Thus, if there is a cut-off point for gender, our participants were beyond the relevant age.

7. The test investigated other phenomena in addition to gender marking (154 items in total), but we only report on gender here.

8. Ideally, we should have selected nouns that conform to only one type of rule, but it was impossible to find appropriate nouns, while balancing for gender and the gender of translation equivalents in German.

9. Exclusion vis-à-vis inclusion of DPs with inconsistent gender marking on the article does not lead to noticeable changes in the error rate because an equal number of DPs with correct and incorrect gender marking is excluded/included.

10. Note that *platane* is a cognate in German and French.

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