

Rhetorical questions in Italian between theory and acquisition

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*Alla mia famiglia
Quella piccola e quella grande*

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Thesis abstract

This dissertation investigates rhetorical questions (RhQs) in Italian, their linguistic marking, and their acquisition in a monolingual and a bilingual setting. RhQs are utterances with the syntactic and semantic properties of a question, but they are not used to ask for information: rather, the speaker utters a RhQ to indicate that the answer is obvious. The answer to the question is presupposed by the speaker, who uses the RhQ to “make a point”. The rhetoricity of a question needs to be signalled to the addressee through contextual and/or linguistic cues, which convey aspects of the speaker's emotive or epistemic attitude or point to the shared knowledge between the speaker and the addressee. Thus, producing and understanding RhQs requires a complex interaction of linguistic phenomena, pragmatic reasoning, and conversational competence. Such complex and multi-faceted phenomena at the interface between language and general cognition are predicted to be acquired in late childhood or early adolescence, and to be particularly challenging in bilingual acquisition. Comparing monolingual and bilingual children on the acquisition of the same phenomenon allows for a comparison of two different modes of acquisition.

The target bilingual population of this work are Italian-German bilingual children, acquiring Italian as (one of) the language(s) of the family (i.e., the heritage language) and German as the language of the environment (i.e., the majority language). A heritage language is acquired under distinct conditions, as the input the child receives is usually quantitatively and qualitatively different from the input that a monolingual receives, and the heritage language may undergo the influence of the majority language; degrees of language experience, proficiency and dominance vary widely across different speakers.

In **Chapter 2**, I investigate which lexical and morphosyntactic cues (henceforth, lexical-syntactic cues) mark RhQs in colloquial Italian, focusing on questions that presuppose a negative answer (such as *Who eats broccoli for breakfast?! = No one eats broccoli for breakfast!*). Through an elicitation experiment, I show that this type of RhQs can be marked by a variety of cues, which are all optional and contribute to the rhetorical interpretation of a question by various means. Importantly, most cues do not force the rhetorical interpretation; rather, they are ambiguous with other types of questions that express the speaker's negative attitude, surprise, or inability to find an answer, or even with canonical information-seeking questions (ISQs).

The discrepancy between the type of utterance (interrogative) and the discourse function of RhQs (more similar to an assertion) poses them as an interesting topic for acquisition, both in monolingual and bilingual settings. Through a series of tasks, I investigate the acquisition of optional pragmatic marking in RhQs by 6-to-9-year-old children, as well as the similarities and differences between monolingual and bilingual acquisition. The multiplicity, optionality, and ambiguity of pragmatic cues, as well as their being a phenomenon at the interface between language, pragmatics and general cognition, predicts this phenomenon to develop later in childhood, potentially throughout the primary school period.

In **Chapter 3**, I investigate through a Comprehension task whether monolingual and bilingual children are able to distinguish between RhQs and ISQs without a context, solely based on prosodic and lexical-syntactic cues. The results indicate that children were able to correctly interpret questions as rhetorical or non-canonical when provided with a combination of lexical-syntactic and prosodic cues, while the ability to do so from prosody alone is greatly variable among children. Bilingual and monolingual children behave similarly in this task.

In **Chapter 4**, I address the acquisition of lexical-syntactic cues in production. I compare 6-to-9-year-old Italian monolingual children and Italian monolingual adults on a Production task, observing the patterns of optional modification of RhQs and ISQs in each group. In this task, children modified RhQs using the same types of cues as adults (with the exception of formulaic embedding under *want*, a strong rhetorical cue). This result indicates that some children have acquired some cues, but it does not imply that all children did. A developmental pattern is found in the rate of modification, as younger children (6- and 8-year-olds in particular) use on average fewer cues than adults, while 9-year-olds display the same pattern and frequency as adults. The findings suggest that the acquisition of optional pragmatic marking in RhQs is still ongoing in this age range, confirming the complexity and multidimensionality of the phenomenon.

In **Chapter 5**, bilingual children are tested on the same Production task and their results are put in relation with those of monolingual children. Bilingual children exploit the same types of cues as monolinguals to mark RhQs throughout the investigated age range. Nevertheless, they do so at lower rates and do not present the same developmental pattern shown by monolinguals, such that, as a group, 9-year-olds are at the same level as 6-year-olds. Additionally, bilingual children show some instances of transfer from the ML, in

particular in the occasional translation of German discourse particle *schon* ‘already’, a strong rhetorical cue, into the Italian equivalent *già*. I discuss a number of possible reasons for such divergences, including different levels of language experience and of proficiency in the HL, as proven by the effect of background measures, in particular vocabulary diversity (obtained from a narrative task) and dominance (calculated from language experience). The results of this study indicate that children can only acquire and exploit the fine patterns of pragmatic expression through linguistic means if they are sufficiently exposed to their HL, Italian, in quantitatively and qualitatively rich contexts.

In **Chapter 6**, I bring together and discuss the findings of the various experiments; while the explicit goal of the thesis is to examine the patterns of linguistic marking in RhQs, I draw some inferences on children’s acquisition of rhetoricity itself, suggesting that in the investigated age range children are acquiring not only the overt linguistic marking, but also RhQs as a pragmatic category. Finally, in **Chapter 7**, I conclude and suggest several opportunities for future research.

Taken together, the findings of the present dissertation shed light on a yet unexplored topic in monolingual and bilingual language acquisition, contributing to the wider issue of how the complex relations between communication and language interact with different modes of acquisition, and paving the way for many further research directions on the acquisition of RhQs.

Zusammenfassung

In dieser Dissertation werden rhetorische Fragen (RhQs) im Italienischen, wie diese sprachlich markiert werden sowie ihr Erwerb in monolingualen und bilingualen Kontexten untersucht. RhQs sind Äußerungen, die zwar syntaktische und semantische Eigenschaften einer Frage aufweisen, allerdings nicht dazu verwendet werden, Informationen zu erfragen. Vielmehr werden RhQs geäußert, um anzuzeigen, dass die Antwort offensichtlich ist. Die Antwort auf die Frage wird vorausgesetzt, um einen Standpunkt klar zu machen. Die Rhetorizität einer Frage wird den Adressat*innen durch kontextuelle und/oder sprachliche Merkmale signalisiert, die die emotionale oder epistemische Haltung der Sprecher*innen vermitteln oder auf das gemeinsame Wissen von Sprecher*innen und Adressat*innen hinweisen. Das Produzieren und Verstehen von RhQs erfordert also ein komplexes Zusammenspiel von sprachlichen Phänomenen, pragmatischer Argumentation und Gesprächskompetenz. Es wird davon ausgegangen, dass solche komplexen und vielschichtigen Phänomene an der Schnittstelle zwischen Sprache und allgemeiner Kognition in der späten Kindheit oder frühen Jugend erworben werden, und dass sie beim bilingualen Erwerb eine besondere Herausforderung darstellen.

Der Vergleich zwischen monolingualen und bilingualen Kindern beim Erwerb desselben Phänomens ermöglicht einen Vergleich zweier unterschiedlicher Erwerbsmodi. Die mehrsprachige Zielpopulation sind italienisch-deutsche bilinguale Kinder, die Italienisch als Familiensprache (Herkunftssprache) und Deutsch als Sprache der Umgebung erwerben (Mehrheitssprache). Eine Herkunftssprache wird unter anderen Bedingungen erworben: der Input der Kinder ist in der Regel quantitativ und qualitativ anders als bei monolingualen Kindern, und die Herkunftssprache kann unter dem Einfluss der Mehrheitssprache stehen. Der Grad der Spracherfahrung, der Beherrschung und der Dominanz können bei den verschiedenen Sprecher*innen sehr unterschiedlich sein.

In **Kapitel 2** wird untersucht, welche Merkmale RhQs in der italienischen Umgangssprache kennzeichnen, wobei ich mich auf RhQs konzentriere, die eine negative Antwort voraussetzen (z. B. *Wer isst Brokkoli zum Frühstück?! = Niemand isst Brokkoli zum Frühstück!*). Anhand eines Elizitationsexperiments zeige ich, dass diese Art von RhQs durch eine Vielzahl von Merkmalen markiert werden kann, die alle optional sind und auf unterschiedliche Weise zur rhetorischen Interpretation einer Frage beitragen. Zu beachten ist, dass die meisten Merkmalen die rhetorische Interpretation der Frage nicht erzwingen;

sie sind vielmehr mehrdeutig und können auch anderen Eigenschaften anderer Fragetypen sein, die die negative Einstellung der Sprecher*innen, ihre Überraschung oder ihre Unfähigkeit, eine Antwort zu finden, zum Ausdruck bringen, oder sogar mit kanonischen Informationssuchende Fragen (ISQs).

Die Abweichung zwischen der Art der Äußerung (Fragesatz) und der Diskursfunktion von RhQs (eher eine Behauptung) macht sie zu einem interessanten Thema für die Spracherwerbsforschung, sowohl in monolingualen als auch in bilingualen Kontexten. Anhand einer Reihe von Aufgaben untersuche ich den Erwerb optionaler pragmatischer Markierungen in RhQs von 6- bis 9-jährigen Kindern sowie die Gemeinsamkeiten und Unterschiede zwischen monolingualem und bilinguaalem Erwerb. Die Vielfältigkeit, Optionalität und Mehrdeutigkeit pragmatischer Hinweise sowie die Tatsache, dass es sich dabei um ein Phänomen an der Schnittstelle zwischen Sprache, Pragmatik und allgemeiner Kognition handelt, lässt vermuten, dass sich dieses Phänomen erst später in der Kindheit erworben wird und sich möglicherweise während der gesamten Grundschulzeit entwickelt.

In **Kapitel 3** untersuche ich anhand eines Verstehenstests, ob einsprachige und zweisprachige Kinder in der Lage sind, zwischen RhQs und ISQs allein auf der Grundlage prosodischer und lexikalisch-syntaktischer Merkmale ohne Kontext zu unterscheiden. Die Ergebnisse zeigen, dass die meisten Kinder in der Lage sind, Fragen korrekt als nicht-kanonisch zu interpretieren, wenn sie eine Kombination aus lexikalisch-syntaktischen und prosodischen Merkmalen erhalten, während die Fähigkeit, dies allein anhand der Prosodie zu tun, bei den Kindern sehr unterschiedlich ausgeprägt ist. Bilinguale und monolinguale Kinder verhalten sich bei dieser Aufgabe ähnlich.

Kapitel 4 behandelt die Produktion von lexikalisch-syntaktischen Merkmalen im Spracherwerb. In einer Produktionsaufgabe werden 6- bis 9-jährige italienisch-monolinguale Kinder und italienisch-monolinguale Erwachsene getestet und die Muster der optionalen Modifikation von RhQs und ISQs durch spezifische lexikalische und syntaktische Cues in den beiden Gruppen verglichen. Bei dieser Aufgabe modifizierten die Kinder RhQs auf die gleiche Art und Weise wie Erwachsene (mit Ausnahme der formelhaften Einbettung unter wollen, einem starken rhetorischen Merkmal). Dieses Ergebnis deutet darauf hin, dass zwar einzelne Kinder, aber nicht alle Kinder einige Merkmale erworben haben. Ferner zeigt sich ein entwicklungsbedingtes Muster: Jüngere Kinder (insbesondere 6- und 8-Jährige) verwenden im Durchschnitt weniger Merkmale als Erwachsene, während ältere Kinder (9-Jährige) in der Verwendung von Merkmalen die gleichen Muster und die gleiche Häufigkeit

wie Erwachsene aufweisen. Die Ergebnisse legen nahe, dass der Erwerb optionaler pragmatischer Markierungen in RhQs in diesem Altersbereich nicht abgeschlossen ist, was die Komplexität und Multidimensionalität des Phänomens bestätigt.

In **Kapitel 5** werden bilinguale Kinder mit derselben Produktionsaufgabe getestet wie die monolingualen Kinder in Kapitel 4 und die Ergebnisse der beiden Gruppen werden in Beziehung gesetzt. Bilinguale Kinder in allen untersuchten Altersstufen die gleichen Arten von Merkmalen wie monolinguale, um RhQs zu markieren. Sie tun dies jedoch in geringerem Maße und weisen nicht die gleichen Entwicklungsmuster wie einsprachige Kinder auf: 9-Jährige bilinguale Kinder weisen die gleiche Entwicklungsstufe auf wie 6-Jährigen bilinguale Kinder. Darüber hinaus zeigen bilinguale Kinder einige Fälle von Transfer aus der Mehrheitsprache. Zum Beispiel scheinen sie deutsche Diskurspartikel *schon*, ein starker rhetorischer Cue, in das italienische Äquivalent *già* zu übersetzen. Ich erörtere eine Reihe möglicher Gründe für solche Abweichungen, darunter unterschiedliche Stufen der Spracherfahrung und der Beherrschung der Herkunftssprache, die durch die Erhebung von Hintergrundvariablen, insbesondere der Wortschatzvielfalt (ermittelt auf der Basis einer Bildbeschreibung) und der Dominanz (berechnet auf der Basis von Spracherfahrung), belegt werden. Die Ergebnisse lassen vermuten, dass die Kinder für die subtilen pragmatischen nur dann die sprachlichen Mittel erwerben und nutzen können, wenn sie ihrer Herkunftssprache, dem Italienischen, regelmäßig und in vielfältigen Kontexten ausreichend ausgesetzt sind.

In **Kapitel 6** diskutiere ich die Ergebnisse aller Experimente und führe sie zusammen. Während das explizite Ziel der Arbeit darin besteht, die Muster der sprachlichen Markierung in RhQs zu untersuchen, werden auch einige Rückschlüsse auf den Erwerb der Rhetorizität an sich bei Kindern gezogen. Es gibt Hinweise, dass die Kinder im untersuchten Altersbereich nicht nur die sprachliche Markierung, sondern auch RhQs als pragmatische Kategorie erwerben. In **Kapitel 7** ziehe ich abschließend ein Fazit und definiere Forschungsdesiderata, die sich aus dieser Arbeit ergeben.

Insgesamt geben die Ergebnisse der vorliegenden Arbeit Aufschluss über ein bisher unerforschtes Thema im mono- und bilingualen Spracherwerb. Die Arbeit trägt zu der umfassenderen Frage bei, wie die komplexen Wechselwirkungen zwischen Kommunikation und Sprache mit den verschiedenen Erwerbsmodi interagieren und ebnen den Weg für zukünftige Forschung zum Erwerb von RhQs.

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List of Abbreviations

2L1	Simultaneous bilingual
AoO	Age of onset
Cfv-questions	'Can't-find-the-value-of-x' questions
CG	Common ground
DV	Dependent variable
eL2	Early second language learner (a.k.a. sequential bilingual)
HL	Heritage language
HS	Heritage speaker
ISQ	Information-seeking question
IV	Independent variable
L2	Second language
ML	Majority language
NPI	Negative polarity item
RD	Clitic right dislocation
RhQ	Rhetorical question
st	semitones

Abbreviations used in figures

Bili.Chi	Bilingual children
Mono.Adu	Monolingual adult
Mono.Chi	Monolingual children
HS.Adu	Adult heritage speaker

Abbreviations used in glosses (other glosses follow the Leipzig glossing rules)

AGGR	Aggressive expression
CL	Clitic pronoun
PRT	(Discourse) particle

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Chapter 1. INTRODUCTION

1.1 Scope of the dissertation

Questions typically have a straightforward function: a speaker is missing a piece of information, and they use a question to communicate this knowledge gap to an addressee; by the act of uttering a question, the speaker is requesting the addressee to provide the missing information, i.e., to fill the gap. This is the canonical function of questions (Dayal 2016; Farkas 2022; Groenendijk and Stokhof 1984). But questions can do much more than that. In particular, not all questions are information-seeking questions (ISQs). For example, a question can be used to state that the answer is actually obvious: while having an interrogative form, it is not used to ask for information, but rather to put forth a rhetorical point (Biezma and Rawlins 2017; Farkas 2023; Ilie 1994; Rohde 2006). Rhetorical questions (RhQs) are at the heart of this dissertation, in which I will focus on RhQs in Italian, on their linguistic marking and on their acquisition in monolingual and bilingual settings.

The work leading to the present dissertation was conducted within the project “Non-Canonical Questions in Early and Late Bilingual Language Acquisition” (project P10 of the research unit FOR2111 “Questions at the interfaces” at the university of Konstanz, funded by the Deutsche Forschungsgemeinschaft [DFG]). Tanja Kupisch and Theo Marinis are the PIs of the project, and the work was carried out together with fellow PhD candidate Miriam Geiß, as well as a number of student researchers. The overarching goal of the project was to investigate the comprehension and production of various forms of linguistic marking in RhQs across different populations: monolingual children and adults, bilingual children, adult heritage speakers, adult second language (L2) learners. The discrepancy between the type of utterance (interrogative) and the discourse function of RhQs (more like an assertion) poses them as an interesting topic for acquisition, both in monolingual and bilingual settings, each with their own predictions. The linguistic focus was on Italian and German; for bilingual speakers, Italian was always the minority language (or heritage language), and German was the language of the environment (or majority language). The comparison of different populations and different linguistic profiles offers a comprehensive view of different types of acquisition processes and opens a window on the mechanisms that underlie them.

The experimental material and the leading research questions of this dissertation stem from the overarching research questions of the project. In my thesis, I focus on Italian, which was the only native language of monolingual speakers and the heritage language of bilingual children. The goal of the dissertation is threefold. First, it aims at describing the

linguistic forms that RhQs can take in Italian, focusing on lexical and morphosyntactic cues. Second, it investigates the developmental patterns of RhQs. Third, it explores the specificities of bilingual acquisition in a heritage language setting in relation to RhQs.

1.2 The empirical field: rhetorical questions

RhQs are utterances of interrogative form that are not used to ask for information, but rather to put forth a rhetorical point by signalling the fact that the answer to the question itself is obvious (Biezma and Rawlins 2017; Rohde 2006; Caponigro and Sprouse 2007; Ilie 1994). Biezma and Rawlins (2017) formalize this intuition by stating that RhQs are interrogatives that carry the presupposition that the answer is already available to all participants in the conversation, as illustrated in (1). As such, they are included in the larger category of non-canonical questions, that is, interrogatives that depart in some way from the default function of regular ISQs (Farkas 2022).

- (1) A: We should make hot chocolate and invite our friends over.
B: That's a great idea!
Who doesn't like a nice cup of hot chocolate?
(Obvious answer: Everyone likes a nice cup of hot chocolate)

A RhQ is always uttered in reaction to a context, and it is interpreted in relation to that context. For example, the question in (1) is used by speaker B to reinforce their agreement with speaker's A previous point. RhQs are not a unitary category: they show different characteristics along a number of dimensions, which in turn influence the different forms that they can take. It is crucial therefore to define the boundaries of the empirical field under investigation.

The first source of variation is the type of answer presupposed by the question, which can be of the same or of the opposite polarity of the question itself. Consider (2) and (3): in (2), the question is of positive polarity while the intended answer is negative; in (3) the question is of negative polarity and it points to a positive obvious answer. Both are cases in which the polarity of the question is reversed in the presupposed answer. In (4), instead, the question is of positive polarity, and it is used to point to a specific positive answer. Thus, both question and answer have the same polarity. Throughout the thesis, I shall only consider questions that have a positive polarity, such as (2) and (4). Henceforth, I will refer

to question-answer pairs of opposite polarity as *negative-answer RhQs* (2) and question-answer pairs of the same polarity as *positive-answer RhQs* (4). While both types are discussed in Chapter 2, the remainder of the experimental work is focused on negative-answer RhQs.

- (2) *Who eats broccoli for breakfast?!* (positive)
 Obvious answer: No one eats broccoli for breakfast. (negative)
- (3) *Who doesn't like a nice cup of hot chocolate?* (negative)
 Obvious answer: Everyone likes a nice cup of hot chocolate. (positive)
- (4) *Who always helped you when you were in trouble?* (positive)
 Obvious answer: John always helped you when you were in trouble. (positive)

A second source of variation in RhQs is their communicative function. For example, Farkas (2023) distinguished between RhQs used to challenge a previous stance (5), to support a previous point (6), or to settle an open issue (7) (the examples are mine). The focus of the thesis will be on the first kind, i.e., questions that are used as a challenge to the interlocutor or to the context.

- (5) A: Victoria should be our nominee for the next election.
 B: Come on! *Who will vote for her?!* She was involved in too many scandals.
- (6) A: I think Victoria should be our nominee for the next election. After all, *who is the most popular politician in town?*
- (7) A: Who should be our nominee for the next election?
 B: Well, *who is the most popular politician in town?*

The communicative function of the RhQ is related to the third dimension, i.e., the type of attitude that is expressed by the question. If RhQs are used to react to the previous context, either by contradicting or by strengthening a previous point, they will often express elements of the speaker's attitude towards that context (e.g., Goto 2018; Neitsch 2019; Celle, Jugnet, and Lansari 2021). For example, B's reply in (8) is rhetorical because it presupposes the answer that no one likes liver, but it is also used to convey the assumption that A's idea is silly and she should not have made such a proposal (cf. Goto 2018, 48). Similarly, RhQs can convey surprise (e.g., Celle, Jugnet, and Lansari 2021), sarcasm (Goto 2018; Neitsch 2019), criticism, incredulity, etc. (cf. Neitsch 2019 and references cited therein).

- (8) A: We should cook liver for our next dinner party.
B: That's absurd. *Who likes liver?!*

Since languages can encode elements of emotive attitude through lexical, grammatical, and prosodic elements, the attitude expressed by a certain RhQ in relation to the context can change its linguistic form. A typical example is the expression *the hell* (9), which, attached to a wh-constituent, expresses a speaker's negative attitude towards the proposition¹. I will refer to such additional elements as *linguistic marking* or *linguistic cues*.

- (9) *Who the hell likes liver?!*

The presence of such cues can help a listener to interpret a question as rhetorical, even when the context is not sufficient or when it is absent. However, the presence of a single cue, whether lexical or prosodic, is rarely sufficient to fully disambiguate the type of question (Dehé et al. 2022; Dehé, Wochner, and Einfeldt 2022; Neitsch 2019; Sorianoello 2020). For instance, the question in (9) may be used as rhetorical to say that it is obvious that no one likes liver, but it may also be used to express the speaker's surprise that someone likes liver, while still asking the addressee to provide the desired information (i.e., it may also be an ISQ expressing the speaker's surprise). The information-seeking vs rhetorical nature of a question is therefore not always clearly outlined, and it may remain unspecified (Goto 2018, 33). The relationship between linguistic cues, the context on which they depend, and the rhetoricity of the question is at the heart of this thesis. The type of context that I will focus on is similar to the example in (8), in which the RhQ is used as a negative remark to criticise and counter a question or suggestion made by another person.

Lastly, a rhetorical interpretation can be obtained both from a polar (10) and a wh-question (or constituent questions) (11). Throughout, I will focus only on wh-questions and leave polar questions for future research. The two types of questions have different properties, especially at the prosodic level: prosody behaves differently in polar and wh-questions, both as ISQs and as RhQs (e.g., Dehé et al. 2022; Sorianoello 2018; Gili Fivela et al. 2015). The choice fell on wh-questions because this question type appears to be more

¹ Questions with *the hell* are also identified as “aggressively-non-D-linked questions” (see Pesetsky 1987 and subsequent work); they are not always rhetorical, and sometimes the boundary between rhetorical and non-rhetorical *wh-the-hell* questions is not well defined. This issue will be discussed in detail in Chapter 2.

natural in the specific sub-type of RhQ under investigation (Dehé, Wochner, and Einfeldt 2022).

(10) *Has any of my friends ever lifter a finger to help me?!*

(11) *Who has ever lifter a finger to help me?!*

Recapitulating, in this dissertation I investigate the linguistic marking of RhQs in Italian and its acquisition in monolingual and bilingual settings, focusing on RhQs with the following characteristics: i) wh-questions, ii) with an intended negative answer, iii) used to challenge a previous point, iv) expressing criticism and a negative attitude towards the proposition². **Chapter 1** is dedicated to an investigation of which cues mark this type of RhQs in Italian and how they relate to the context, the speaker's attitude and the rhetoricity of the question itself.

1.3 RhQs and language acquisition

1.3.1 The problem, the promise, and the challenges

I turn now to the matter of why RhQs pose an interesting topic for language acquisition, as well as the challenges that it poses to empirical research. The acquisition of RhQs can be investigated from two perspectives: the communicative aspect and their linguistic marking. With the first, I refer to the acquisition of RhQs as a pragmatic category, i.e., acquiring knowledge of the fact that some questions are used not to ask for information but for a different function, namely, to make a point. In this respect, RhQs are often associated with irony and other non-literal forms of language, because they involve a mismatch between the literal interpretation of the question and the intended interpretation or discourse function: when do children start comprehending and producing such non-literal and expressive forms of language? To do so, it is important for a child to develop the necessary socio-pragmatic skills and the ability to interpret other people's intentions, goals, and states

² This type of context is based on much previous work conducted in particular on the prosody of RhQs by the project P6 in the research group "Questions at the Interfaces", carried out by PIs Bettina Braun and Nicole Dehé and colleagues (Braun et al. 2019; Dehé and Braun 2020b; 2020a; Dehé, Wochner, and Einfeldt 2022; Wochner et al. 2015; Zahner-Ritter et al. 2022, a.o.).

of mind³ (e.g., Antoniou et al. 2020). Furthermore, RhQs often express the speaker's attitude and emotions, and may thus depend on the ability to comprehend and express emotions. Research on these neighbouring domains suggests that the period around 6 years of age is an important landmark in the development of socio-communicative skills, also in relation to language (see, e.g., Antoniou et al. 2020 for irony, communicative competence and non-literal language; Wellman, Cross, and Watson 2001 for theory of mind; Yow and Markman 2015 for emotion recognition in speech).

The second perspective on the acquisition of RhQs concerns the acquisition of their linguistic marking. While the communicative aspect can be considered language neutral, the acquisition of individual cues is language specific. Consider the RhQ in (9), repeated in (12). Here, the rhetoricity of the question is signaled by the presence of the phrase *the hell*, which modifies the wh-word *who* and expresses the speaker's negative attitude (Celle, Jugnet, and Lansari 2021; Dikken and Giannakidou 2002). In order to comprehend or produce this question as rhetorical, a child acquiring English needs to learn several pieces of knowledge and be able to integrate them together: (i) the lexical expression "the hell" and its syntactic computation; (ii) the semantic and pragmatic value of the expression itself; (iii) the knowledge that a question may be non-information-seeking; (iv) the ability to derive the inference that, by combining the semantics of questions and the expression "the hell" with the context, this question should not be interpreted as information-seeking but as rhetorical.

(12) *Who the hell likes liver?*

The same process may be applied to all the other cues, be it lexical, morpho-syntactic, or prosodic. However, not all cues are equivalent: Some cues are stronger than others; some cues are more frequent than others; some rely on more complex syntactic or semantic derivations, and the three dimensions may not align. As an example, (13) reports three cues that can mark RhQs in Italian: sentence-initial particle *ma* 'but', the adverbial particle *mai* 'ever' and an embedding construction with the verb *volere* 'want' (these cues are discussed in 2.3.4).

³ An ability known as Theory of Mind (Wellman, Cross, and Watson 2001).

- (13) a. **Ma** *chi mangia il fegato?!*
 but who eat.3SG the liver
- b. *Chi mai mangia il fegato?!*
 who ever eat.3SG the liver
- c. *Chi vuoi che mangi il fegato?!*
 who want.2SG that eat.3SG.SBJV the liver
 ‘Who eats liver?!’

The first cue, *ma* (13a), is very frequent in the type of context under investigation, but it is not a strong cue to rhetoricity, as it is ambiguous with other types of non-canonical questions. Conversely, *mai*, in the syntactic position in which it occurs in (13b), is a much stronger cue to rhetoricity, but it is more infrequent than *mai*. Finally, the want-embedding construction in (13c) is even stronger, as it is unambiguously rhetorical. Nevertheless, it is as infrequent as *mai* and it relies on more complex syntax (i.e., embedding and the use of subjunctive in the embedded verb).

Another important consideration is that not only are the individual cues language-specific, but they are also optional: as evident from (13), the same RhQ can be marked by each of the exemplified cues (or by a combination of them), but each can be absent while the question remains rhetorical. A question may also be string-identical with an ISQ and be marked as rhetorical only by its prosody, but even this is not a necessary condition: a question of neutral form may be interpreted as rhetorical even in written language if the context provides enough information (see (5-7) above).

In acquisition terms, this may manifest itself in a mismatch between a child’s acquisition of the communicative function of RhQs *versus* their acquisition of the language-specific cues. Let us consider two opposing scenarios.

A child may have learned that a question can be rhetorical but not have acquired all the various linguistic cues of the target language. In comprehension terms, this may signify that the child will only recognize RhQs from their context, or only from the cues that they have already learned. In production terms, this means that a child may be able to produce a question intending it as rhetorical, but marking it only with the optional cues that they have already learned, or none at all.

Conversely, a child may have learned the characteristics and the specific function of a certain cue, but not the concept of a RhQ yet. For example, an English-acquiring child may have acquired the expression *who the hell* and its attitudinal meaning, but still use questions

exclusively to ask for information. In this case, a child uttering *Who the hell eats liver?* may be producing a question that expresses incredulity, surprise, etc., but still be asking for the relevant piece of information. In terms of comprehension, the child may either be unable to interpret the additional cues present in the sentence, or be able to decode the single piece of attitudinal meaning but not the question as rhetorical.

Even in the case a child has acquired both aspects of RhQs, investigating their acquisition empirically poses a challenge to the researcher. Assuming that a child has learned that a question can be rhetorical and is able to comprehend all of the relevant cues, in production they may focus only on one cue or produce questions of ambiguous form. If markers are optional, it is not possible to define “acquisition” in terms of constructing grammatical vs ungrammatical sentences, nor in terms of a certain percentage of use in obligatory contexts, nor through a simple truth value judgement task.

The partition between the communicative aspect (i.e., RhQ as a discourse device) and linguistic marking (i.e., optional cues) itself, while useful for explanatory purposes and empirical investigation, is hard to keep separate. Both sides should be investigated separately and in interaction with each other, but this is easier said than done. Which aspect comes first? How do they interact with each other? How is it possible to investigate them and tap into the child’s actual interpretation and communicative intention? The attempt to answer these questions constitutes the exciting challenge that RhQs present to language acquisition, although finding a full answer to them is of much wider scope than this dissertation. Herein, I will restrict the field of empirical research to one of the two aspects, namely the acquisition of linguistic marking. The endeavour of bridging this first gap holds the promise of shedding light on the whole issue and reveal new avenues of investigations. Whenever possible, inferences about the acquisition of RhQs as a pragmatic category will be made based on the clues offered by the results on the acquisition of linguistic marking.

In **Chapter 3**, I address the comprehension of RhQs based on their linguistic form, combining prosodic cues with lexical and morpho-syntactic cues (henceforth called *lexical-syntactic cue* for brevity). In a comprehension experiment, questions of different forms were presented out of context. The goal was to investigate whether children were able to map a certain form onto the corresponding context. In **Chapters 4 and 5**, I examine the acquisition of lexical and morpho-syntactic cues in production. In a production task, a context is provided and the patterns of optional modification of RhQs are observed.

1.3.2 The target population: primary-school-aged children

The choice of the target population in the experiments that focus on language acquisition (Chapter 3, Chapter 4 and Chapter 5) fell on Italian monolingual and Italian-German bilingual children⁴ between 6 and 9 years of age. Both in Germany and in Italy, children start primary school at around age 6 and finish it at around age 10. This age span was chosen following several considerations. Firstly, as discussed in 1.3.1, age 6 is considered a crucial age in the acquisition of various forms of pragmatic competence and non-literal language, such as irony. Secondly, the acquisition of different linguistic phenomena is expected to happen at different times based on their characteristics. For example, Tsimpli (2014) distinguishes between early, late and very-late acquired phenomena. Early acquired phenomena include core morpho-syntactic features and are acquired in the first years of life, while late-acquired phenomena involve higher semantic complexity and discourse sensitivity (Tsimpli 2014, 293) and are acquired by around age five. At this age, Italian-acquiring children have typically acquired the morphosyntactic properties of the verbal and the nominal domains, clause structure, pronominal clitics, passives, relative clauses, etc. (Belletti and Guasti 2015). Some phenomena are acquired even later (“very-late-acquired phenomena” in Tsimpli’s terminology), because they involve complex interactions between language-internal interfaces, discourse appropriateness and external cognitive processes. For example, the appropriate use of referential forms requires, besides the linguistic knowledge of the forms involved, “language-external components such as cognitive control in memory, updating and inferencing and a developed social cognition” (Tsimpli 2014, 295)⁵. In Tsimpli’s proposal, the more a phenomenon requires language-external resources for appropriate use and the further it is from a purely linguistic account, the later it is acquired. Once again, primary school years are crucial in the development of such phenomena.

Given that RhQs involve a complex interplay of communicative, discourse, inferential and intra-linguistic factors, they are expected to fall within the category of very-late-acquired phenomena, and their acquisition is expected to develop in the investigated age range. The type of study was cross-sectional, such that a true longitudinal investigation of

⁴ The specific issues posed by bilingual acquisition are discussed in the next section.

⁵ This issues has also been discussed within the framing of the Interface Hypothesis (Sorace 2011; see also Kupisch and Rothman 2016; Serratrice, Sorace, and Paoli 2004).

the development of the same children was not possible. Nevertheless, the comparison of different age groups can give insight into the potential developmental paths.

1.4 The bilingual perspective

In this dissertation, I investigate the acquisition of RhQ marking in two different acquisition settings, i.e., monolingual and bilingual acquisition. In this section, I will define the key characteristics of the two types of populations, the specific areas of interest of bilingual acquisition compared to monolingual acquisition and some key concepts in bilingual acquisition research.

1.4.1 Monolingual vs heritage speakers

The “monolingual” populations investigated in this work consist of children and adults who were born and grew up in Italy, never lived abroad until adulthood and had been raised in an Italian-speaking environment. It should be noted, however, that many participants included in this group are not monolinguals *strictu sensu* in two ways.

The first issue is that Italy presents a high linguistic diversity under the uniformity of the national language. So-called Italian “dialects” are a group of linguistic varieties (the Italo-Romance varieties, which can be considered regional languages) that originated from Latin alongside the variety that then became (standard) Italian (Loporcaro 2013; 2016)⁶. In spite of the increasing use of Italian, which in many families replaced the local dialect, in several Italian regions a part of the population is still bilingual, or more accurately *bilectal* (Berruto 2018)⁷. Excluding bilectal speakers from “monolingual” recruitment was not feasible for several reasons. Firstly, Italo-Romance varieties and Italian are very closely typologically related, and the situation of extreme language contact has caused various degrees of language mixing, resulting in “regional Italians”. Thus, rather than a clean

⁶ Alongside the endogenous varieties, Italy also presents a variety of minority languages of external origin, including both historical minorities (e.g., Germanic, Gallo-Romance or Slavic varieties), some of which are officially recognized by law, and minorities of recent immigration (Berruto 2018; Loporcaro 2013). Individuals who were bilingual with non-Italo-Romance varieties were excluded from recruitment.

⁷ This term is useful to differentiate from the Italian-German type of bilingualism, although the terms “dialect” is somewhat misleading, considering that the bilingualism in question is between Italian and a regional language, and not between two varieties of the same language.

separation between standard Italian and the Italo-Romance variety, there is often a continuum along scales of formality and regional connotation⁸. Secondly, even when the two linguistic codes are sufficiently separate and identifiable, it is hard to determine who is bilingual and who is not, since often the local dialect is pervasive enough in the society that even non-active speakers have some level of exposure and good passive competence. Thus, bilingual adults and children exposed to a dialect in the family were included in the sample.

The second issue with the characterisation of monolingual speakers is that, minimally, English is taught as a foreign language since kindergarten or primary school, such that children were exposed to a second language in school; besides, adult participants may have studied other foreign languages in school or spent some time abroad.

While the label “monolinguals” is technically imprecise for the aforementioned reasons, it will be conventionally used to indicate speakers of Italian who grew up in the homeland and acquired it as the main societal language, reflecting the current sociolinguistic situation of Italy, and in opposition with the “bilingual” population, characterised by the presence of German as a second distinct native language. In any case, the same confounding variables are also present in the bilingual population: English is also taught in German schools (and other languages in higher grades), and a child growing up in Germany with Italian speaking parents may be exposed either to a more standard variety of Italian, or to a strongly regional variety, or to both Italian and a dialect (and thus be in fact trilingual; see Arona and Kupisch 2022 for this population)⁹.

⁸ This is more pronounced for some varieties more than others, such as Tuscan and Roman Italian. For other varieties, such as Sicilian or Venetan, the continuum exists, but it is still possible to identify two separate linguistic codes (see Berruto 2018).

⁹ Exposure to English in school is unlikely to affect the acquisition of RhQ marking; to my knowledge, RhQs and related topics are never object of formal instruction, especially in the first years of education. The effect of bilingualism is harder to define. For example, if a certain regional variety has a specific cue, bilingual speakers may transfer it to Italian. However, once again, it is hard to define the boundaries between dialect and regional Italian. Apart from the cases of language mixing mentioned above, it is very common that speakers who are not confident users of the local dialect and only speak Italian in their everyday life borrow expressions from the dialect, such that expressive means of communication become part of regional Italian. Differences in geographical areas were addressed in Ferin (2024), but were not discussed here because they were minor and not crucial to the discussion in this thesis.

Not all bilinguals are alike, as there are many different profiles of bilingualism. The type of bilinguals investigated here are so-called *heritage speakers* (HSs). This label refers to speakers who grow up in an environment in which the language spoken in the family or one of the languages spoken in the family, i.e., the *heritage language* (HL) is different from the societal language, a.k.a the *majority language* (ML) (Benmamoun, Montrul, and Polinsky 2013; Montrul 2016; Polinsky 2018; Rothman 2009). This situation is typical of migrant families and migrant communities, such as the Italian community in Germany, which is the target of the present research. HSs can be simultaneous bilinguals (2L1), i.e., start being exposed to both their languages simultaneously from birth, or early sequential bilinguals (eL2). In this case, the age of onset (AoO) of exposure to the ML is later than that of the HL.

The acquisition of two languages at the same time is a complex and fascinating process, which poses new questions to the study of language acquisition. A monolingual acquirer receives input in one language and gradually develops the target vocabulary and grammar. A bilingual acquirer, on the contrary, receives input in two languages and thus needs to develop two separate systems. This puts the acquisition process of the HL under the double pressure of reduced input (since the total amount of input is shared between the two languages) and of language contact (as the two linguistic systems interact with each other within the same speaker) (Di Pisa 2023, 7; Hulk and Müller 2000; Müller and Hulk 2001; Paradis and Genesee 1996).

The acquisition of a HL has been found to differ in its development and outcome from the acquisition of the same language in a monolingual setting (e.g., Benmamoun, Montrul, and Polinsky 2013; De Houwer 2017; Meisel 2001; 2004; Montrul 2016; Polinsky 2018; Polinsky and Scontras 2019), although speakers of both groups are native speakers of that language (Rothman 2009; Kupisch and Rothman 2018). The divergences in the outcome of acquisition may be attributed to a variety of factors: the quantity and quality of exposure to the language (a.k.a., input) (e.g., Unsworth 2016), the age of onset of bilingualism (Meisel 2001), the influence of one language on the other (usually but not exclusively of the dominant on the weaker language), a different use of processing resources caused by the higher maintenance costs of two separate systems (Polinsky and Scontras 2019; Sorace 2011), attrition (Benmamoun, Montrul, and Polinsky 2013; Polinsky and Scontras 2019).

The command of receptive and productive skills in the HL is subject to very high variation (Benmamoun, Montrul, and Polinsky 2013), which depends on the magnitude and interplay of the aforementioned factors. Besides the variability in proficiency in each single

language, the relative strength of the two languages in a bilingual individual is often not equal, but rather one language (the *dominant language*) is stronger than the other (Silva-Corvalán and Treffers-Daller 2015; Treffers-Daller 2019). Input, proficiency and dominance change across the lifespan of the bilingual. Typically, exposure to the HL is stronger in infancy, while the ML becomes more and more present as the child starts receiving childcare outside the family and then formal instruction in the country of residence, as well as socialising with peers (Benmamoun, Montrul, and Polinsky 2013). Formal instruction is also an important factor in the development and maintenance of the HL. Some HSs only receive instruction in the ML, while others receive different degrees of literacy also in the HL.

There are several ways in which the two linguistic systems can interact with each other. Cross-linguistic influence (CLI) can manifest itself in different ways, identified by Paradis and Genesee (1996) as acceleration, delay (or deceleration) and transfer. Acceleration happens when the timing of acquisition of a certain phenomenon is earlier in bilingual than in monolingual acquisition, for example if one language provides additional evidence to the bilingual and helps acquisition in the other (Kupisch 2007; Lleó et al. 2003). *Deceleration* means that the acquisition of a certain phenomenon happens later in bilingual acquisition than it does in the same language in a monolingual setting. *Transfer* happens when linguistic features of one language are transferred to the other. CLI can occur in both directions, but the stronger the dominant language is, i.e., the greater the imbalance, the more probable the directionality of the transfer from the ML to the HL. Divergences in bilingual acquisition can also result not from CLI, but from more general processes of language change related to bilingualism itself, and not a specific language combination, reflecting differences in language processing (e.g., Serratrice 2007; Sorace et al. 2009). Further, differences can also be caused not by processes related to bilingual acquisition itself, but from changes in the input that bilinguals receive: adult first-generation immigrants can undergo attrition in their L1, providing a different input to children who acquire it as a HL (e.g., Tsimpli et al. 2004).

1.4.2 RhQs and bilingual language acquisition

In section 1.3.2, I have outlined the relevance of investigating RhQs from a developmental perspective. The considerations outlined there also hold for bilingual acquirers, but the acquisition process occurs under different conditions.

The two aspects of RhQ acquisition, the communicative side and the linguistic marking side, make different predictions for bilingual language acquisition. Like monolinguals, bilingual children need to acquire the functional aspect of RhQs (the “concept” of a rhetorical question). This side of acquisition can be thought of as language independent, since it involves the development of pragmatic reasoning, social cognition and intention reading. These faculties have been found to develop in bilinguals at a par with monolingual children, or even earlier (e.g., Antoniou et al. 2020; Siegal et al. 2010; Siegal, Iozzi, and Surian 2009). On the other hand, bilingual children need to acquire the language-specific cues of RhQs, but this may prove to be problematic if children do not receive enough input in the HL. This is especially true for very-late-acquired phenomena (Tsimpli 2014) that rely on continual and sufficient exposure to the relevant input also later in childhood. If children do not receive it, they may never develop all of the strategies available in the HL and the subtle contextual rules necessary to use them appropriately (Dubinina and Malamud 2017). In this case, they may use no marking at all, given that cues are optional, or they may use the other linguistic resources that they have access to, i.e., those of the ML. In this sense, the acquisition of RhQ marking and its use in context may fall in line with phenomena at the interface between language-internal and language-external faculties which often lag behind monolingual acquisition or undergo a differential acquisition path (Kupisch and Rothman 2016; Sorace 2011; Serratrice 2013).

Thus, the investigation of this phenomenon in a bilingual setting is particularly interesting because, as Dubinina and Malamud (2017) put it, “by examining pragmatic competence in bilingual speakers who have not completely acquired their first language, we can study the boundary between the universal and language-specific in pragmatics, and between grammar and social cognition” (Dubinina and Malamud 2017, 69).

A similar line of research has been conducted on adult HSs with various language dyads on the appropriate formulation of requests in the HL (Avramenko and Meir 2023 for Russian-Hebrew; Dubinina and Malamud 2017 for Russian-English; Pinto and Raschio 2007 for Spanish-English; Keevallik 2012 for Estonian-Swedish)¹⁰. Requests are a universal speech act, but languages use different conventional means to express requests with the appropriate level of politeness. For example, in some languages it is appropriate to formulate a direct request with an imperative (e.g., Spanish), while other languages avoid

¹⁰ In each language pair, the first language of the dyad is the HL and the second is the ML.

direct request and formulate indirect requests by means of questions (e.g., English). It is also possible to mitigate the imposition of a request by the use of various lexical and grammatical means, such as particles (e.g., *ne* or *li* in Russian), modals, verbal tense, lexical expressions (e.g., *please*). HSs often transfer the request strategy from the ML to the HL, which is considered a result of the combination of reduced input in the HL and of CLI from the ML. For example, HSs of Spanish use more indirect requests in Spanish than what is conventionally accepted by monolingual Spanish speakers, who use more direct requests (Pinto and Raschio 2007); Heritage Russian speakers use modality, particles and lexical expressions differently than homeland speakers, under the influence of the ML English (Dubinina and Malamud 2017) or Hebrew (Avramenko and Meir 2023). Importantly, failure to use the form that is conventionally appropriate in the speaking community can result in communication failures between heritage and homeland speakers, and to perceived rudeness, as was found for Estonian HSs in Sweden (Keevallik 2012). This last consideration underscores the importance of acquiring not only the core grammatical properties of a language and its vocabulary, but also its subtle pragmatic uses and socio-linguistic conventions: language is used to communicate, and successful communication is the ultimate goal.

The focus of bilingual acquisition in this work is on the acquisition of linguistic marking in RhQs, focusing on bilingual children (i.e., looking at the acquisition in progress). In **Chapter 3**, monolingual and bilingual children are compared in the comprehension of prosodic and lexical-syntactic cues. In **Chapter 5**, I investigate the patterns of lexical-syntactic RhQ marking in bilingual children, again in comparison with the monolingual population.

Chapter 2. RHETORICAL QUESTIONS IN ITALIAN: LEXICAL AND SYNTACTIC CUES

2.1 Introduction

Studies on the morphosyntactic and lexical correlates of RhQs are not very systematic, such that information usually needs to be retrieved somewhat indirectly from other works. This is true also for Italian, for which a few studies are available on the prosodic (Soriano 2018; 2019; 2020; see Ippolito 2021 for gestures) and syntactic form of RhQs (Obenauer and Poletto 2000), or on their pragmatic and communicative aspects (Anzilotti 1982; Fava 1994; Stati 1982). These studies, though ground-breaking, are often confined to a formal/written register, or they do not specify whether the register they consider is formal or colloquial, nor do they take into consideration regional variation, which is substantial in colloquial varieties of Italian. Furthermore, while single cues may be analysed individually, no analysis of quantitative patterns of modification is present to date. A lack of comprehensive analyses is also observable for prosody and intonation, which are highly varied throughout Italy (Gili Fivela et al. 2015). Although the difference between RhQs and ISQs is sometimes generically referred to as a falling vs. rising opposition, the empirical reality is not quite as simple. In fact, there appears to be no one-to-one mapping between prosody and function (i.e., a univocal prosodic form dedicated to RhQs as opposed to ISQs), as shown for Italian (Soriano 2018) and other languages (Dehé et al. 2022).

The goal of this chapter is to investigate the linguistic forms that RhQs can take in colloquial Italian, observing the frequency of occurrence of certain cues when RhQs are elicited in a given context, focusing on colloquial language and including participants from all over Italy¹¹. An exploratory experiment served as the starting point for a more thorough description of the various cues. In an elicited production experiment, negative-answer RhQs were elicited and coded for any lexical and morphosyntactic cues. Each cue was then evaluated, determining a) the semantic and/or pragmatic function of each, and b) which are direct markers of rhetoricity, and which are only indirect correlates.

¹¹ The role of regional variation was addressed in Ferin (2024), where I differentiated between northern, Tuscan and southern speakers. Some effects of geographical areas were found, but they were not crucial to the present discussion; thus, I do not address them here. The interested reader is referred to the article for further details.

2.2 What are rhetorical questions?

2.2.1 The semantics and pragmatics of rhetorical questions

The canonical use of utterances with an interrogative form is that of a request for information from a speaker to an addressee (Dayal 2016; Groenendijk and Stokhof 1984). When the question is rhetorical, however, the speaker is signalling that an answer is not required, because it is already known to or inferable by the participants to the speech act (e.g., Biezma and Rawlins 2017; Caponigro and Sprouse 2007; Fava 1994; 1995; Han 2002; Rohde 2006). Therefore, RhQs have the (superficial) syntactic form of a question, but do not seek information. In the past couple of decades, the semantic nature of RhQs has been subject to debate. At first, a semantic approach was proposed to account for the difference between ISQs and RhQs. According to Han (2002), on a semantic level RhQs are not questions but assertions, with the *wh*-element functioning as a negative operator. In Han's analysis, the intended answer to a RhQ has the opposite polarity to the question itself, that is, a positive question entails a negative answer, and vice versa. Examples are provided in (14) and (15):

- (14) *Who eats broccoli for breakfast?!* (positive)
 Assertion: No one eats broccoli for breakfast. (negative)
- (15) *Who doesn't like a nice cup of hot chocolate?* (negative)
 Assertion: Everyone likes a nice cup of hot chocolate. (positive)

Caponigro and Sprouse (2007) contend that, although not requiring it, RhQs allow for an answer, and not always a negative one (or one with a reversed polarity), but they also allow for a positive answer (16). They propose a pragmatic account, in which RhQs are syntactically and semantically equivalent to ISQs but their answer is taken to belong to the Common Ground (CG), i.e., the set of assumptions that are shared by the speaker and the addressee (Stalnaker 1974; 2002).

- (16) You should stop saying that Luca didn't like the party last night. *After all, who was the only one that was still dancing at 3am?*
 Answer: Luca (still dancing at 3am)

(Caponigro and Sprouse 2007, 4)

Biezma and Rawlins (2017) further restrict this definition, stating that RhQs are questions that convey a special attitude on the part of the speaker, namely that they take the answer to be presupposed in the CG. In Biezma and Rawlins' view, the function of RhQs is to extract commitments from the addressee on the content of the utterance. Biezma and Rawlins (2017) also state that a RhQ requires a conventional trigger for the presupposition, that is, the rhetoricity of a question is always signalled through a cue, be it prosody, a discourse particle, or the form of the question itself.

2.2.2 Rhetorical questions as 'non-canonical questions'

From a wider perspective, RhQs can be included in the larger category of 'non-canonical questions' (Dayal 2016; Farkas 2022). Farkas (2022) assumes that the canonical use of a question is accompanied by four default assumptions: *speaker ignorance*, *addressee competence*, *addressee compliance* and *issue resolution goal* (see also Goto 2018, sec. 3.2.1). To illustrate the difference, consider the wh-question in (17). Here, a variable of individuals introduced by the wh-word *who* produces a set of alternatives (x, x a person, such that x eats bananas). If (17) is used as a canonical question, the speaker is neutral towards the alternatives, having no previous knowledge of which one is the true answer (*speaker ignorance*). Therefore, they request the addressee, whom they assume to know the answer (*speaker competence*) and to be willing to give it (*speaker compliance*), to fill this gap of information. By performing the act of asking (17), the speaker is raising an open issue with the goal of having it resolved (*issue resolution goal*).

(17) *Who eats bananas?*

However, one or more of such standard assumptions may be suspended or weakened, producing 'non-canonical' questions. For example, *quiz questions* are questions in which the speaker ignorance and addressee competence assumptions are contextually suspended, and the speaker is uttering the question, knowing the answer, to test the addressee's knowledge (Farkas 2022). Farkas considers RhQs questions in which the *issue resolution goal* is suspended: the speaker is presenting the issue as resolved, because the answer is already obvious. It should be added that the *speaker ignorance* assumption is suspended as well: the speaker assumes that the answer is already part of the common ground, and they are signalling that this is the case.

The intended answer of a RhQ may be either negative or positive. Compare the example in (14), in which the intended answer is ‘No one eats broccoli for breakfast’ and the one in (18), where the intended answer is ‘Vittoria is the most popular politician in town’. The difference is that, in the first case, none of the entities that may fill the wh-variable is a possible true answer, while, in the second case, among the possible answers, one is obviously the true one, and the identity of the entity that fills the wh-variable needs necessarily to be inferred from the context or the common ground. I refer to the first case as negative-answer RhQs and to the second as positive-answer RhQs.

(18) Anna and Berto are discussing who their party should nominate for the next town council election.

A: Of course we should nominate Vittoria! *After all, who is the most popular politician in town?*

Many other types of non-canonical questions have been identified in the literature, with different taxonomies depending on the analytic approach and the language under scrutiny. In the remainder of this chapter, based on the relevant literature on Italian and German, I will use the following four labels.

The first category are *biased questions* (e.g., Farkas 2022; Ippolito 2021; Romero and Han 2004). In a biased question, the *speaker ignorance* assumption is weakened or suspended: the speaker is not neutral towards the possible answers, because their epistemic state favours one over the other(s). Biased questions are a rather miscellaneous category, depending on the source of the bias, which may originate either in the speaker’s knowledge, or in the context, or in a conflict between these two sources (Farkas 2022, 332). The second category are *counter-expectational* questions (19a) (Giorgi 2018), which are produced when something in the context of utterance goes against the speaker’s expectations. For example, in (19a) the speaker expected an object to be red, but then is confronted with evidence to the contrary. Although they may overlap with biased questions, I will keep them distinct, with biased questions being a more general concept and counter-expectational ones being a more restrictive definition. The third category, *surprise-disapproval* questions (19b) (Giorgi and Dal Farra 2019; Hinterhölzl and Munaro 2021; Obenauer 2004), could be considered a further subset. Here, the speaker expresses at the same time their surprise and a negative emotive attitude, producing an effect of disapproval. A fourth type of non-canonical questions are so-called ‘Can’t-find-the-value-of-x’ questions (Cfv-questions henceforth), or

extreme ignorance questions (Eckardt and Yu 2020), by which the speaker expresses their inability to find an acceptable answer to the question despite their effort to do so (19c) (Obenauer 2004; see also Coniglio 2008; Hinterhölzl and Munaro 2021).

- (19) a. *Wasn't this red?*
 b. *What the hell are you doing?!*
 c. *Where on earth did I put my keys?!*

Besides the four aforementioned types of non-canonical questions, which will be relevant for the discussion of Italian RhQs throughout the thesis, many other types have been studied: among many others, self-addressed questions and conjectural questions (e.g., Eckardt 2020; Frana and Menéndez-Benito 2023), echo questions (Badan, Gryllia, and Fiorin 2017), tentative questions (Farkas 2020), etc.

2.2.3 Syntactic and lexical cues to RhQs

When a question is unmarked (i.e., the sentence presents an interrogative form without additional marking), it can be used either canonically or non-canonically (Farkas 2022). For example, the question in (14) is interpreted rhetorically given the context in which it occurs, but its form (*Who eats broccoli for breakfast*) is compatible with an information-seeking reading. However, a question may also present a marked form, for example including a particle, or another type of discourse marker. In this case, the non-canonical interpretation would derive from the meaning of the marker combined with the question. Thus, a rhetorical reading may arise from the context via pragmatic inference, from the compositional meaning of the question and its markers, or from a combination of the two (Biezma and Rawlins 2017). This amounts to saying that some linguistic cues are sufficient in themselves to trigger a rhetorical reading, while others are not, but are conventionally present in (at least some types of) RhQs and contribute more or less indirectly to the rhetorical interpretation.

At the syntactic and lexical level, there are several correlates to RhQs. For example, negative polarity items (NPIs) are expressions that can only be licensed in specific semantic contexts, such as in the presence of negation. ISQs cannot license inherently emphatic NPIs, also called minimizers (e.g., *lift a finger*), but RhQs can (Jeong and Roelofsen 2023). Thus,

the sentence in (20) is only grammatical under a rhetorical reading (or at least a biased one, according to Guerzoni 2004).

(20) *Who will lift a finger to help Mary?*

Some languages, like German, use discourse particles, such as *schon* ‘lit. already’, *denn*, and *auch* ‘lit. also’ (Dehé, Wochner, and Einfeldt 2022; Viesel and Freitag 2019). While *schon* forces a rhetorical interpretation (Bayer and Obenauer 2011; Biezma and Rawlins 2017), *denn* is also compatible with non-rhetorical uses. Its presence merely provides a cue that a rhetorical reading is more probable. The two particles can also be combined, strengthening the rhetorical reading even further (21).

(21) *Wer isst denn schon Rosinen?!*

who eats PRT PRT rasins

‘Who eats raisins?!’

It is still a matter of debate how each of the cues mentioned above contributes to signalling the rhetoricity of the question. Even those cues that “force” a rhetorical reading do not appear to contribute “rhetoricity” as a piece of meaning, but rather to derive a rhetorical interpretation through the combination of their meaning with the meaning of the question. The issue remains open of which cues are direct markers of semantic or pragmatic meaning, and which ones are correlates of the attitude associated with the uttering of the RhQ (e.g., speaker attitude, sarcasm, criticism).

2.2.4 Rhetorical questions in Italian: state of the art

The relatively scarce literature on RhQs in Italian focusses mostly on pragmatic aspects (Anzilotti 1982; Crisari 1975; Fava 1994; 1995; Stati 1982). Some authors describe also some grammatical markers (Stati 1982), others provide indirect evidence by means of giving examples. As observed in the previous section, many RhQs appear to be ambiguous with ISQs at a surface level, although some force a rhetorical interpretation either through their content or through syntactic and lexical means (Stati 1982).

As possible grammatical cues to RhQs, Fava (1994; 1995) reports the use of a different verbal mood from a canonical question (infinitive instead of indicative) and a different positioning of the wh-phrase (i.e., wh-in-situ, vs. the normal wh-fronting in Italian), both

exemplified in (22). Several authors stress the presence of a negative component, either for the presence of NPIs (23) or for the inversion of polarity in the question (Anzilotti 1982; Fava 1994; Sorianello 2018).

(22) *Andare dove?*

go.INF where

‘To go where?’

(23) *Chi ha alzato un dito per aiutare Maria?*

who has lifted a finger to help.INF Maria

‘Who lifted a finger to help Mary?’

(Sorianello 2018, 41)

The features in (22), however, are strongly associated with a written and formal style. Some examples reported by Stati (1982) and Obenauer and Poletto (2000) are closer to a colloquial register. In (24-26) we find the initial adversative particles *ma* ‘but’ and *e* ‘and’ and the periphrastic expression *volete che* ‘do you want that’ (which is more common in the second person singular: *vuoi che*, see 2.3.4.6).

(24) *Ma chi ha più visto Giorgio da quando si*

but who has anymore seen Giorgio since when REFL

è sposato!

is married

‘(But) who ever saw Giorgio again since he got married!’

(Stati 1982, 189)

(25) *E cosa avrebbe potuto fare in un frangente simile?*

and what have.COND could done in a situation similar

‘And what could she have done in a situation like that?’

(Obenauer and Poletto 2000, 139)

(26) *Come volete che possa ricordare?*

how want.2PL that can.SBJV.3SG remember.INF

‘How do you think he can (lit. do you want him to) remember?’

(Stati 1982, 202)

The examples reviewed above show several forms that a RhQ can take in Italian, but they appear to be neither exhaustive nor well explained in their function: what is the role of initial *e* and *ma* and how are they related to rhetoricity? Which structures belong to a formal and which to an informal register? How frequent are they in spoken language? These questions remain open and motivated the development of the elicited production experiment (Section 2.3).

Obenauer and Poletto (2000) analysed the syntactic structure of RhQs, focusing of wh-questions with an inversion of polarity (i.e., negative-answer RhQs), and taking the particle *mai* ‘ever’ as a marker of rhetoricity when it forms a constituent with the wh-phrase; see (27) ((7a) in Obenauer and Poletto, 2000, 124). The authors analyse the behaviour of wh-phrases with respect to subject inversion and the interaction with other left-peripheral elements (e.g., left dislocations and hanging topics) and conclude that the wh-element in RhQs raises higher in the syntactic structure than it normally does in ISQs (as also argued by Benincà 2001). *Mai*, however, is only compatible with an RhQ whose intended answer is negative, and not with a positive-answer RhQ.

- (27) *Cosa mai avrei potuto dire?*
 what ever have.COND.1SG could say.INF
 ‘What could I have ever said?’

To conclude, although there are some indications in the literature as to which cues can mark a RhQ, it is not clear which lexical-syntactic cues are most common in colloquial speech and what their semantic and pragmatic contribution to the question is. To address the aforementioned gaps in the literature, I developed an exploratory experiment with an elicited production design, aimed at identifying which syntactic cues are used for RhQs in a colloquial register.

2.3 Quantitative patterns: an elicited production experiment

The experiment consisted of an elicited production design, with the aim of eliciting the cues that are used for RhQs in colloquial Italian and comparing them to ISQs and other types on non-canonical questions.

2.3.1 Method



The experiment was set up online, using the platform SoSci Survey (Leiner 2019). It was composed of two tasks: a *written translation* task and an *oral elicitation* task. In the first part of the experiment, participants were explicitly instructed on the difference between ISQs ('normal questions', described as really asking for information), and RhQs ('rhetorical questions'). The latter were described as questions whose answer is obvious to speaker and listener, thus used not to request information, but to comment on a situation. To make the question type more prominent, the target sentence was associated with an emoticon expressing the requested attitude, as exemplified in **Table 1**. Then, participants completed the written translation task.¹² They were presented with eight contexts in English, followed by the target question. Three contexts elicited wh-RhQs and three wh-ISQs; two contexts eliciting polar questions (one of each type) were added as fillers. The contexts of elicitation were freely based on the typical contexts that have been used in recent studies to elicit the prosody of RhQs in several languages (e.g., Braun et al. 2019; Neitsch 2019 for German; Dehé and Braun 2020b for English). In a similar fashion, the context elicited a negative-answer RhQ, used by the speaker to remark critically on a situation presenting some conflict with what they assume to be common knowledge. Full instructions and contexts are available in Appendix A.

The participants' task was to translate the target sentence into Italian, and they were allowed to add words or partially modify the structure of the sentence. An example is given in **Table 1**. Participants were specifically instructed to be as natural as possible in their answer.

In the oral elicitation task, participants read similar contexts, this time in Italian. The target sentence was not provided; instead, one or two words were given as cues (as in (28-29)), and participants had to record a sentence containing the given words. In the target

¹² Although the translation of a sentence from another language is not a common methodological choice in elicitation experiments, this part of the task was added after a preliminary piloting phase. Originally, only the oral elicitation task had been planned. However, it was observed during pre-piloting that participants had some difficulties understanding the type of sentence that they should produce only based on the two given words. The introduction of the translation task allowed to present the type of sentence that I meant to elicit (i.e., a wh-RhQ in connection with a certain context) and trained participants to use wh-RhQs also in the oral task. The results reported below show that participants behaved similarly in the two tasks.

Table 1. Example items in the written translation task. The example on the left presents an ISQ, the example on the right presents a RhQ.

Example of ISQ context	Example of RhQ context
<p>You are the leader of a youth group, and your group is visiting Rome. You would like to know whether the teenagers want to go to a museum or not. You say to them:</p> <p style="text-align: center;"><i>Who wants to go to the museum?</i></p> <p style="text-align: center;"></p>	<p>Your aunt offers limes to her guests. However, it is known that this fruit is too sour to be eaten alone. You say to your cousin:</p> <p style="text-align: center;"><i>Who eats limes?!</i></p> <p style="text-align: center;"></p>

items, the first given word was either *chi* ‘who’ (wh-question) or *qualcuno*, ‘someone’ (polar question), and the second was the object noun. Thus, the freedom to use any structural and/or lexical cues was guaranteed, while ensuring that the sentence be a wh- or polar question, as required. Five contexts elicited wh-questions, four negative-answer RhQs and one ISQ.¹³ Two examples are provided in (28) and (29). Contexts were formulated in an informal style to prevent participants from resorting to formal language. The same goal informed the decision to elicit the sentences orally and not just in written form.

(28) **RhQ context**

Matteo sta preparando una cena per la vostra compagnia e vuoi aiutarlo. Ti dice che di secondo vuole fare il fegato... Ovviamente, tu sai che non lo mangerà nessuno. Gli dici:

‘Matteo is preparing a dinner for your friends, and you want to help him.

He says that he wants to prepare liver as the main course... of course, you know that nobody will eat it. You tell him:’

Cue

... *chi* ... *fegato* ...?!

‘... who ... liver ...?!’

(29) **ISQ context**

Stai organizzando una cena per il compleanno di una tua amica e vuoi sapere se

¹³ The number of contexts for each condition was unbalanced; given the exploratory nature of this work and the limitations imposed by the testing conditions, the choice was to elicit a greater number of wh-RhQs, the main point of interest for the study.

gli invitati mangiano la pasta al ragù o no. Chiedi:

‘You're organizing a birthday dinner for your friend, and you would like to know if all the guests eat Bolognese. You ask:’

Cue

... *chi* ... *ragù* ...?

‘... who ... Bolognese ...?’

Three additional contexts were designed to target other types of non-canonical questions: a positive-answer RhQ, a surprise-disapproval question, and a conjectural question expressing concern, to investigate whether some cues may be shared by RhQs with other types of non-canonical questions. Four contexts were added as fillers. All contexts are reported in Appendix A. Finally, participants completed a language background questionnaire, including detailed questions about the place(s) where they were born, grew up and had resided, their variety of Italian and use of dialect(s), their parents' origin and spoken varieties, and knowledge of other languages. The data of participants who completed the two tasks but abandoned the survey before completing the questionnaire were discarded.

The sentences were transcribed and annotated for lexical and syntactic cues. Sentences that did not have the target form (e.g., exclamatives, echo questions) were excluded from analysis. Each question was transcribed and tagged for lexical and morpho-syntactic cues, considering all relevant additions to the basic structure of *who* + *verb* + *object* (30a). In (30b), the question is modified by two elements: the particle *ma* ‘but’ at the beginning of the sentence and conditional morphology on the verb. Hence, this question was assigned the tags ‘*ma*’ and ‘conditional’. These two tags are independent of each other, since the two cues could occur independently.

- (30) a. *Chi mangia il fegato?*
 who eat.3SG the liver
 ‘Who eats liver?’
- b. *Ma chi mangerebbe il fegato?*
 but who eat.COND.3SG the liver
 ‘Who would eat liver?’

2.3.2 Participants

Ninety-three participants completed the survey. Four of them were excluded because they were early bilinguals with languages other than Italo-Romance dialects¹⁴. For some participants, the oral data is not available, either because the quality of the recordings was poor, or because they did not record any sentences. These participants were not excluded from analysis, but only the translation part was analysed. Thus, a total of 89 participants (Age: $M = 28.8$, $SD = 7.6$, range = 20 – 58; Gender: 25 male, 63 female, 1 divers) entered the final dataset, which included only translation data for 25 participants, and both translation and oral data for 64 participants. All participants were native speakers of Italian. At least basic knowledge of English (i.e., the ability to comprehend a simple written text) was required during recruitment; all participants self-reported knowledge of English, from basic to native-like. 33 participants were from northern Italy, 18 from Central Italy and 38 from Southern Italy (details of the regions of origin are provided in Appendix A).

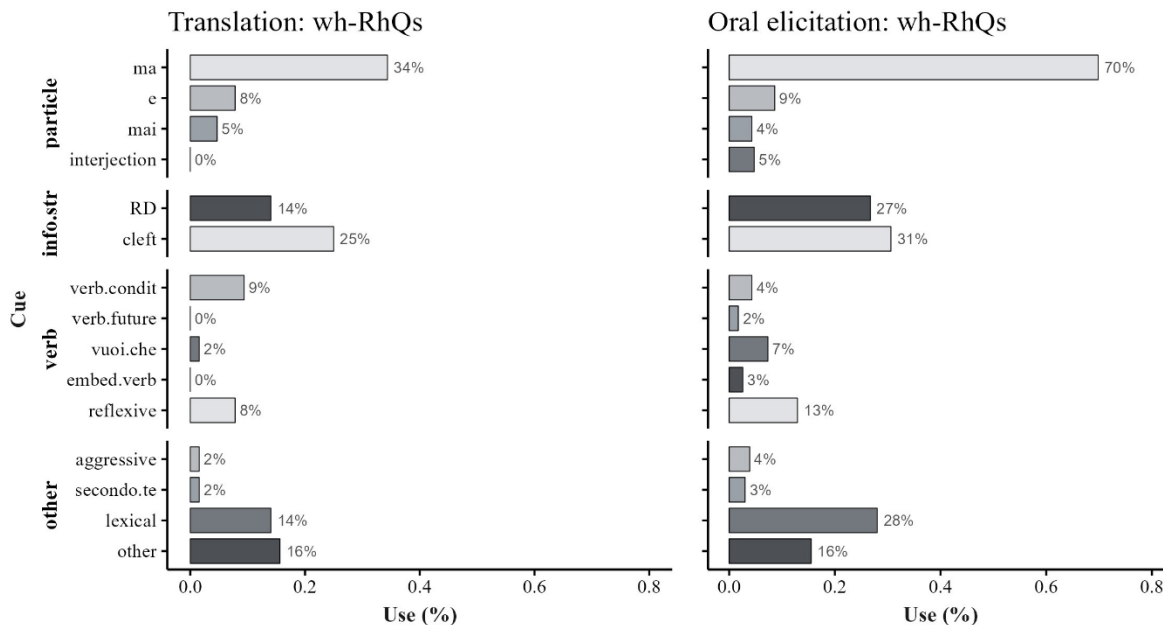
2.3.3 Results

Figure 1 reports which cues were present in wh-RhQs in the two tasks, showing the proportion of questions that were modified by each cue. A sentence could be modified by more than one cue; therefore, each percentage is independent of each other. The plots show that, although the sentences in the translation task were modified less frequently than sentences in the oral elicitation task, the pattern of use is similar in both tasks. The sentence-initial particle *ma* ‘but’ is by far the most frequent cue (70% of wh-RhQs in the oral elicitation task and 34% in the translation task). It is followed by cleft structures and by right dislocation (RD) with clitic resumption. RhQs may also present a verb with future tense, conditional mood, or a reflexive form; they may include the particles *e* ‘and’ and *mai* ‘ever’ or an aggressive expression; they may be embedded by a verb such as *pensare* ‘think’, *credere* ‘believe’, *volere* ‘want’ in the second person; they may be preceded by an interjection indicating the speaker’s attitude or an interaction with the addressee. Finally, they may include an overt lexicalization of the contextual information that makes the intended

¹⁴ Italo-Romance dialects (see Loporcaro 2013 for an overview) were not considered in the classification of speakers as bilinguals (see discussion in 1.4.1). Thus, a speaker of Italian and, e.g., Veneto or Neapolitan would be included in the analysis.

answer obvious. Each cue will be examined in detail in Section 2.3.4. Throughout, the percentage of use in the translation and oral elicitation task will be conflated.

Figure 1. Proportion of RhQs in which lexical-syntactic cues are used in the translation task and the oral elicitation task. embed.verb = embedding verb; info.str = information structure; lexical = overt lexicalization of context.



2.3.4 Analysis of the lexical and syntactic cues

2.3.4.1 Particles: *ma* ‘but’ and *e* ‘and’

The particle *ma* ‘but’ was the most frequent cue in the corpus and was present in 62% of wh-RhQs. In its base use, *ma* has an adversative function, analogous to *but* in English. When it is used as a discourse particle at the beginning of a question (31), it takes a counter-expectational value, by which the speaker signals that there is some contrast between the proposition and their previous expectations or knowledge (Giorgi 2018). The use of *ma* is not limited to RhQs, but it is attested in several types of non-canonical questions in Italian. Giorgi and Dal Farra (2019) investigate their use in counter-expectational and surprise-disapproval questions, while Ippolito (2021) explores its use in biased questions more in

general as well as RhQs¹⁵. In the present study, *ma* was also present in the additional contexts, especially in the surprise-disapproval context (65%) (32) and the conjectural one (57%), but also in the positive-answer RhQ (25%). The results for the additional contexts and for wh-ISQs (conflating oral and elicitation tasks) are reported in **Figure 2**.

(31) **Ma** *chi è che mangia il lime?!*
 but who is that eat.3SG the lime
 ‘Who eats lime?!’

(32) Context: The speaker picks up the addressee’s bag, but it is much heavier than normal
Ma *cos’ hai qui dentro?!*
 but what have.2SG here inside
 ‘(But) what have you got in here?!’

Hinterhölzl and Munaro (2021, 54) consider *ma* incompatible with RhQs. More specifically, they state that *ma* is present in surprise-disapproval and Cfv-questions, while RhQs can be introduced by *e* ‘and’, establishing an opposition between the two particles. In contrast, I propose that *ma* can also mark RhQs, provided it is uttered in a situation of contextual conflict or to challenge the interlocutor (33). To substantiate this point, we can apply one of the diagnostics for RhQs identified by Sadock (1971), as reported by Caponigro and Sprouse (2007). In this test, if a question is followed by a *yet*-clause, it is a RhQ. As (34) shows, this is possible with *ma*. Example (33) also shows that *ma* is compatible with a strong

¹⁵ In the references mentioned here, *ma* is used in counter-expectational polar questions (i) and surprise-disapproval questions (ii). In Giorgi (2018) and Giorgia and Dal Farra’s (2019) analysis, *ma* is a discourse head which encodes a conflict with some salient information in the previous context (see also Ippolito, 2021) and is anaphoric to the context itself (i.e., the propositional content of the question needs to be linked to some proposition in the context of utterance).

(i) *Ma non era rosso?* (Giorgi 2018, 70)
 but not was.3SG red
 ‘Wasn’t it red?!’

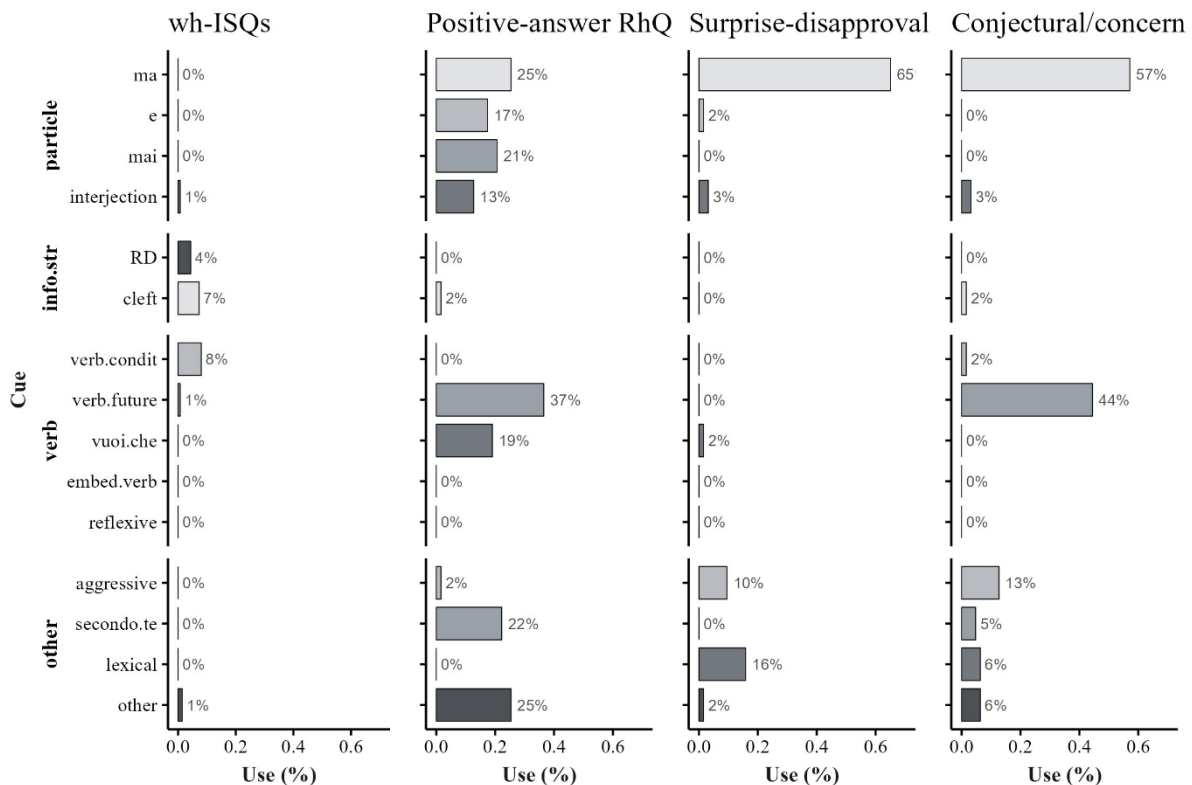
(ii) *Ma cosa leggi?* (Giorgi and Dal Farra 2019, 337)
 but what read.2SG
 ‘What are you reading?!’

rhetorical cue such as the ‘want’-embedding (see 2.3.4.6 below), which contradicts the idea that *ma* does not introduce RhQs.

- (33) A: Vittoria vorrebbe diventare la sindaca della sua città.
 ‘Vittoria would like to become mayor of her town.’
 B: **Ma** *chi vuoi che la voti?!* Sono tutti contro il suo partito.
 but who want.2SG that her.OBJ vote.SBJV.3SG
 ‘Who will vote for her?! Everyone is against her party’.
- (34) *Ma chi è che mangia i lime?!* Eppure, Gianni ne ha comprati dieci!
 ‘Who eats limes?! Yet John bought ten!’

When a RhQ does not express a contextual conflict but has a different function, such as that of strengthening a previous point, the use of *ma* is indeed not felicitous, as shown in (35).

Figure 2. Proportion of use of each cue in ISQs (results from the oral elicitation and the written translation task are conflated), RhQs with a positive answer, in surprise-disapproval questions and in conjectural questions expressing concern.



(35) Smettila di dire che a Luca non è piaciuta la festa ieri. *Dopotutto, (#ma) chi ha ballato fino alle tre del mattino?*

‘You should stop saying that Luca did not have fun at the party yesterday. After all, (#but) who danced until three in the morning?’

(translated from Caponigro and Sprouse 2007, 4)

The particle *e* ‘and’ is equal to *ma* for distribution, being also sentence-initial (36), but is much less frequent in the corpus (9%). Similar to *ma*, *e* links the clause it introduces to the preceding context and it is felicitous when the propositional content of the RhQ refers to a previous element in the discourse. *Ma* and *e* are often interchangeable. In example (33) above, *ma* may be substituted with *e*, as shown in (36). Like *ma*, *e* does not necessarily introduce a RhQ. On the contrary, it is compatible with a neutral ISQ when this is a follow-up question (37), signaling that the utterance is a continuation or a completion of a previous utterance (Scorretti 1995).

(36) *E chi vuoi che la voti? Sono tutti contro il suo partito.*

and who want.2SG that her.OBJ vote. SBJV.3SG

‘And who will vote for her?! Everyone is against her party’

(37) A: Ho comprato un prosciutto buonissimo.

‘I bought a delicious ham’

B: Davvero? *E dove l’hai comprato?*

‘Really? And where did you buy it?’

However, in the case of non-canonical questions, *e* seems to (at least partially) share the function of *ma* of making a counterpoint, and like *ma*, it is incompatible with a RhQ that is used to strengthen a previous point, as substituting *ma* with *e* in (35) above would still be infelicitous.

To pinpoint the difference between the two particles, let us consider the base meaning of ‘but’ and ‘and’ (Umbach 2005). Both conjunctions have an additive meaning: the conjuncts must be at the same time similar and distinct, and the meaning of the second conjunct is added to the first one. Simplifying, we can say *I ate [a red apple] and [a green apple]*, but not *#I ate [an apple] and [an apple]*: the conjuncts need to be partially different from each other. ‘And’ is used to add an alternative to one that has already been mentioned. It may give rise to an effect of opposition, but this is a secondary effect, arising from the

necessity of the conjoined elements of being different from each other (Umbach 2005). In its discourse-related use, it has the function of adding an element (a proposition, a talking point) to the discussion, whereby it can cause the said effect of opposition.

The meaning of ‘but’ is not only additive, but also exclusive: it explicitly institutes a contrast between the alternative that it is adding and the other conjunct. When it is used as a discourse particle, as discussed above, the contrast is established with the speaker’s expectation (Giorgi and Dal Farra 2019).

The difference in meaning between ‘and’ and ‘but’, applied to their use as discourse particles, predicts that *e* should have a more restricted use than *ma*. Specifically, *e* is more readily compatible with a RhQs, to signal that the speaker wishes to add a point to the conversation through the rhetorical answer. *Ma*, instead, directly signalling a conflict between the speaker’s expectations and contextual evidence, is also compatible with the other types of non-canonical questions mentioned above: surprise-disapproval, Cfv-questions, biased questions¹⁶. This prediction is partially confirmed by the data of the present study, as *e* is not present in surprise-disapproval and conjectural contexts, while *ma* is (Figure 2).

In summary, *ma* and *e*, as discourse particles¹⁷, link the question to the context of utterance. While *e* has an additive meaning, and can give rise secondarily to an effect of opposition with the context, *ma* is a direct marker of counter-expectations. Both particles do not force rhetoricity, but they contribute to a rhetorical interpretation if the context allows it.

¹⁶ The use of ‘but’ in non-canonical questions, including RhQs, has been analysed in other languages as well. In French, *mais* ‘but’ appears in particular in the construction *mais qu’est-ce que*, introducing surprise questions or RhQs (Celle, Jugnet, and Lansari 2021). Here too, the function of *mais* is used either to establish a pragmatic opposition with a previous expectation or prior belief, or it has the function of introducing a counterargument. A similar use is attested also for Spanish *pero* (Ehmer and Rosemeyer 2018) and for Israeli Hebrew *aval* (Ozerov 2019).

¹⁷ Throughout this section, I have called *ma* and *e* ‘discourse particles’ to distinguish their use with a special pragmatic meaning from their ordinary use as conjunctions. Whether or not *ma* and *e* are syntactically different from their conjunction counterparts is not yet clear. An explicit discussion along the lines of the syntactic status of *mai* in non-canonical questions, i.e., whether *mai* remain and adverbs or acquires the syntactic properties of a discourse particle (see 2.3.4.2), is not present for *ma* and *e*, although Celle, Jugnet, and Lansari (2021) explicitly mention a separate discourse particle status for *mais* in French.

2.3.4.2 Particles: *mai* ‘ever/never’

The adverbial particle *mai* is present in 4% of the sentences in both tasks, indicating that only a few speakers used it. In accordance with previous literature on the topic (Coniglio 2008; Hinterhölzl and Munaro 2021; Obenauer and Poletto 2000), it occurred in two syntactic positions: either immediately after the *wh*-word (38a-b), and in this case the verb can present either indicative or conditional morphology, or in the middle of the sentence, usually after the inflected verb (I will refer to this as the ‘adverbial position’). In the latter case, the verb is always conditional (38c). Obenauer and Poletto (2000) propose that the interpretation of *mai* changes based on its position. When *mai* forms a constituent with the *wh*-phrase, *mai* takes narrow scope over it and the sentence is always interpreted as a RhQ of the opposite polarity (in our terms, a negative-answer RhQ). When it occurs in an adverbial position, instead, it has a Cfv interpretation.

- (38) a. *Chi mai mangerebbe dei limoni?!*
 who ever eat.COND INDF lemons
 ‘Who would ever eat lemons?!’
- b. *Ma chi mai impara poesie?!*
 but who ever learn.IND.3SG poems
 ‘Who would ever learn poetry by heart?!’
- c. *Ma chi andrebbe mai al museo?!*
 but who go.COND ever to.the museum
 ‘Who would ever go to the museum?!’

While I agree that *mai* only allows a negative answer and not a positive one (as shown in (39)), the mapping between position of *mai* and question interpretation is not so categorical. Several native informants allow both readings, rhetorical and Cfv, in both positions (see also Coniglio 2008). Moreover, there appears to be different judgements on the formality of *wh-mai*. While some informants define the option *wh-mai* as their default, others claim that it sounds overly formal and does not belong to their colloquial repertoire. Clearly, further experimental and corpus studies are needed to better determine the range of use and interpretations of *mai*.

- (39) *Smettila di dire che a Luca non è piaciuta la festa ieri. Dopotutto, chi (#mai) ha ballato fino alle tre del mattino?*

‘Stop saying that Luca didn’t like the party yesterday. After all, who (#ever) danced until three in the morning?’

While there remains some controversy on its exact interpretation, it is uncontroversial that *mai* immediately following the *wh*-word has a stronger effect on the interpretation of the sentence, as it does not allow for a purely information-seeking reading even in the absence of conditional. The difference is illustrated in (40) and (41). In (40), the question can be read both as canonical and as non-canonical. In the first case, *mai* retains its base meaning, that of the temporal adverbial ‘ever’, and the question is a sincere request for information about who, among the individuals in the relevant context, has visited Paris at any point in time. In the second case, depending on the context, the question may be read as rhetorical or as a *Cfv*-question, carrying an inference that obviously no one has been to Paris, or that the speaker cannot think of anyone (in the context) who has visited the city. For the question in (41), by contrast, only the second interpretation is available. One remaining issue is whether *mai*, in a non-canonical question, retains its temporal interpretation or not. Below, I will argue that it does in (40) but not in (41).

(40) *Chi ha mai visitato Parigi?/?!*

who has ever visited Paris

‘Who has ever visited Paris?/?!’

(41) *Chi mai ha visitato Parigi?!*

who ever has visited Paris

‘Who has ever visited Paris?’

In its base function, *mai* is a temporal adverb that, depending on the syntactic and semantic context, translates to English ‘ever’ or ‘never’. Like English *ever*, *mai* is a negative polarity item (NPI) with a temporal meaning: it qualifies as an existential quantifier that quantifies over times. As other NPIs, it is only licensed in non-veridical contexts, for example under negation (42b) or in questions (42c), while it cannot occur in a simple declarative sentence like (42a) (Jeong and Roelofsen 2023; Panizza and Romoli 2013). In (42b), the combined meaning of *mai* and negation yields the following interpretation: ‘It is not the case that there is any time *t* such that Gianni ate broccoli at time *t*’ (see Jeong and Roelofsen 2023 for a detailed semantic analysis of NPIs). In addition, *mai* can also occur preverbally in a veridical context, where it is obligatorily stressed (42c); in this case, *mai* has an intrinsically negative

meaning, corresponding to ‘never’, and it is emphatic. This fact is accounted for by Panizza and Romoli (2013) by movement of *mai* to a position in the left periphery of the sentence, hosting focus, where it activates a silent negative feature.

- (42) a. **Gianni ha mai mangiato i broccoli*
 Gianni has ever eaten the broccoli
- b. *Gianni non ha mai mangiato i broccoli*
 Gianni not has ever eaten the broccoli
- c. *Gianni mai ha mangiato i broccoli*
 Gianni never has eaten the broccoli
- ‘Gianni has never eaten broccoli’

(Panizza and Romoli 2013)

Returning to non-canonical questions, it remains to be determined what interpretation *mai* contributes to them. There are two possibilities: a) *mai* retains its temporal meaning and the non-canonical interpretation arises through the composition of such meaning with other semantic and/or contextual elements, or b) *mai* shifts from being an adverb to being a discourse particle. Option b) is the analysis proposed by Coniglio (2008), while Manzini (2015) argues for option a). I suggest that option a) is the case when *mai* is in adverbial position (38c), while option b) is true when *mai* is adjacent to the wh-word (38a-b). In all examples in (38), it is not possible to interpret the sentence canonically, but this effect arises in different ways. (38c) cannot be interpreted canonically because of the combination of *mai* with the conditional. Examples (38a-b), instead, cannot be interpreted canonically because *mai* modifies the wh-constituent, irrespective of verb tense and modality.

Considering example (38c) above, an interpretation of negative bias can be derived by combining the conditional and *mai*. As will be discussed in 2.3.4.3, the conditional provides a modal base, opening a set of worlds that combines with the variable over times introduced by *mai* and shifts the proposition from a realis to an *irrealis* modality. The sentence can be paraphrased as ‘Who, at any time *t* and in any possible world *w*, eats lemons?’, raising the inference that the speaker cannot find an acceptable answer to this question or that the answer should be ‘no one does’. Thus, it is not necessary to assume a different interpretation for *mai*. I refer to this case as the ‘adverbial reading’ of *mai* (see Manzini 2015).

The alternative is a ‘discourse particle reading’, in analogy to what has been proposed for German *schon* (e.g., Bayer and Obenauer 2011), Italian *poi* and *pure* and *mai* itself

(Coniglio 2008; Manzini 2015). Under this reading, what is normally an adverb acquires a different use in relation to discourse. Discourse particles, although adverbial in nature, have distinct syntactic and semantic properties. In particular, they have a lighter structure, grammaticalizing into heads (Bayer and Obenauer 2011; Bayer and Trotzke 2015) or weak constituents (Cardinaletti 2015), and their meaning shifts, as they modify not the proposition but the utterance, expressing the attitude of the speaker or the addressee, or making reference to their shared knowledge. For example, German *schon* is the temporal adverb ‘already’ (43a). It opens a temporal scale, relative to which *schon*(p) indicates a state p occurring immediately after \neg p (Bayer and Obenauer 2011). As a discourse particle, *schon* loses its temporal meaning and acquires new discourse functions. In particular, when it is present in a question, it turns it into a RhQ (43b). Bayer and Obenauer (2011) propose that the scale introduced by *schon* applies not to times, but to entities that can replace the wh-variable, ranking them in terms of plausibility and creating the inference that no entity is plausible enough to return a true answer.

- (43) a. *Er hat schon Limonen gegessen*
 he has already lemons eaten
 ‘He has already eaten lemons’
 b. *Wer isst schon Limonen?*
 who eats PRT lemons
 ‘Who eats lemons?!’ [= no one does]

I suggest that a similar analysis can be applied to *mai* when it immediately follows the wh-constituent. Here *mai* does not have a temporal interpretation, but it shifts its interpretation to the domain of entities introduced by *who*. The obligatorily negative interpretation (\approx ‘No one eats lemons / I cannot think of anyone who eats lemons’) may be derived in two ways. First, we may assume that *mai*, being part of a fronted constituent, activates a silent negative feature, as suggested by Panizza and Romoli (2013). A second hypothesis is that the negative inference arises because a particle in this position is emphatic (Bayer and Trotzke 2015). Jeong and Roelofsen (2023) propose that an emphatic NPI in a wh-question, when the question is not interpreted exhaustively, gives rise to the inference of a negative bias on the part of the speaker. I will leave this issue open for future research. As a final note, in principle nothing prevents a ‘discourse particle’ analysis for *mai* also when it appears in its adverbial position, in analogy with *schon*. I have shown above that deriving

a non-canonical meaning is possible without assuming a shift from adverb to particle, but we cannot rule out that *mai* in adverbial position is ambiguous between the two interpretations.

2.3.4.3 Verb morphology

As mentioned in the previous section, the verb can be modified morphosyntactically: either with conditional mood, future tense, or a reflexive form.

Conditional morphology on the verb (6%) appears either in combination with *mai* (38a,c), *ma* (44) and other cues, or as the only (non-prosodic) cue. The presence of a conditional on its own does not make the question rhetorical, or not even non-canonical: it is compatible with a canonical question, to which it can give a nuance of politeness or offering (45). However, when combined with other cues, a conditional actively interacts with their meaning to produce a non-canonical interpretation.

- (44) *Ma chi mangerebbe un lime?!*
 but who eat.COND.3SG a lime
 ‘(But) who would ever eat lime?’
- (45) *Chi mangerebbe un gelato?*
 who eat.COND.3SG an ice-cream
 ‘Who would (like to) eat an ice cream?’

Dikken and Giannakidou (2002) provide an account of how a conditional in combination with a *wh-the-hell* expression yields a rhetorical reading. As discussed in 2.3.4.5, *wh-the-hell* introduces a negative attitude from the speaker, such that (46a) can be paraphrased as the modal statement ‘if any *x* came to the party, *x* should not have done it’. However, if there is an overt modal, there is no need for modality in the negative attitude, because the modal itself will introduce a set of possible worlds: in general terms, (46b) can be paraphrased as ‘in no possible world, if *x* is a person, *x* comes to the party’.

- (46) a. *Who the hell came to the party?*
 b. *Who the hell would come to the party?*

While there are no instances of aggressive expressions with a conditional in the elicited data, these are possible in Italian, as shown in (47). However, it is not clear that such

questions are unambiguously rhetorical. The question in (47) is compatible with a CfV-context, such as that in (48).

(47) *Chi cavolo comprerebbe un CD degli Eccìù?*
 who AGGR buy.COND.3SG a CD of-the Atchoo

(48) Anna and Berto are in a music shop. They both think the pop band Atchoo is terrible. However, they see that all Atchoo CDs are sold out. Anna says...

In the dataset, the conditional appears either on its own or in combination with other cues, in particular *ma* and *mai*. The same analysis that was sketched above, with minimal modifications, may be applied in these cases as well: the conditional provides a modal base to expand the set of situations in which a positive answer to the question is not possible, not likely or against the speaker's expectations. A similar analysis is suggested by Obenauer and Poletto (2000): in Italian, the conditional introduces *irrealis* modality, by which the proposition becomes non-assertive. In other words, by saying *Who eats broccoli?* the speaker presents the event of eating broccoli as a factual event in the world; while with *Who would eat broccoli?* the event of eating broccoli is presented as hypothetical, as not being known to the speaker to be happening or have happened. In the context of RhQs, this would signal that the event denoted by the proposition is not factual, and no individual filling the wh-variable would make the proposition true. Both analyses predict that a conditional is not compatible with a positive-answer RhQ¹⁸.

The simple future tense in Italian can have, besides its normal temporal (predictive) meaning, an inferential evidential function (Frana and Menéndez-Benito 2019; 2023). In other words, it can be used to signal that the speaker has at best indirect evidence for the proposition. In wh-questions, the source of evidence shifts to the addressee, a common trait for evidentials across languages ('interrogative flip', Frana and Menéndez-Benito 2019), and the evidential future marks the fact that the speaker expects at best a conjectural answer

¹⁸ See also Brown (2023) on Sm'algyax, a Tsimshianic language spoken in British Columbia and Alaska. In this language, the use of the *irrealis* marker *dzi* in a wh-question obligatorily renders it a negative-answer rhetorical question. Notice however that in Italian the conditional can have the same effect, but not obligatorily. The difference lies in the different status of the two markers: in Italian the *irrealis* modality is given by verbal morphology, while in Sm'algyax the particle *dzi* is a complementizer, which substitutes the question particle *u*. A similar effect is also found for Japanese *mono ka*, which also makes the question obligatorily rhetorical with a negative answer by operating at the complementizer level (Oguro 2015; 2018).

(*conjectural questions*) from the addressee. In the present data, a verb with future morphology is present in few negative-answer RhQs (1%) (49), but it is very frequent in two additional contexts: the positive answer RhQ (36%) (50) and the conjectural question (44%) (51). The latter is in line with Frana & Menéndez-Benito (2019). The case of RhQs is less straightforward, because it involves a meaning shift from a conjectural question to one whose answer is taken to be obvious. It is worth noticing that the future mostly co-occurs with *mai*, and it was observed that *mai*, especially when it forms a constituent with the wh-word, enforces a rhetorical or Cfv reading (see 2.3.4.2). Speculatively, the future may be used in RhQs when the speaker considers the answer to be obvious and is inviting the addressee to draw the same conclusion based on the contextual evidence, that is however only indirect (as in (50), see Appendix A for the full context). Another possibility is that the inferential future in combination with *mai* is used ironically: at the literal level, the speaker expresses the impossibility of finding an answer to the question, applying a further ironic reversal that signals that the answer is actually positive and obvious.

- (49) Context: It is obvious that no one wants to go to the museum

Chi vorrà mai andare al museo?

who want.FUT.3SG ever go.INF to.the museum

‘Who will ever want to go to the museum?’

- (50) Context: Someone broke the chair, and it was obviously the speaker’s sister

E chi (mai) sarà stato!

and who ever be.FUT.3SG been

‘Who could have ever done it?!’

- (51) Context: The speaker is very concerned because her son is not home yet

Ma dove sarà!

but where be.FUT.3SG

‘Where could he be?!’

Finally, RhQs may present a verb with a reflexive form (12%), specifically with the reflexive clitic *si*. In Italian, reflexive *si* is used in true reflexive contexts or with verbs that are inherently reflexive; sometimes, however, it occurs even though it is not required by the verb or the context. The reflexive, in this case, is used with affective value, as an intensifier of the verb (Cordin 1995), as is the case for our RhQs. Thus, it could be grouped together

with cues to the speaker's attitude towards the answer, that are discussed in 2.3.4.5, but its degree of intensification is milder than, e.g., aggressive expressions.

- (52) *Ma chi si mangia i lime?!*
 but who REFL eats the lime
 '(But) who eats lime?!'

2.3.4.4 Information structure

Information structure is the way in which the information expressed by the utterance is packaged to be optimally communicated (Krifka 2008). In Italian, RD and cleft sentences are two information structure devices which mark a contrastive focus and a familiar topic respectively (Benincà, Salvi, and Frison 1995). With RD (53) (24%), a phrase is dislocated to the right edge of the sentence and, when possible, resumed by a clitic pronoun within the sentence itself. In our case, the dislocated element is always the object DP, which is resumed by an object clitic. In the cleft questions under analysis (54) (29%), the clefted element is always the wh-phrase *chi* 'who'.

- (53) *Chi li legge, i romanzi?!*
 who CL read.3SG the novels
 'Who reads novels?!'

- (54) *E chi è che legge romanzi?!*
 and who is that reads novels
 '(And) who reads novels?!'

These cues are by no means restricted to rhetorical contexts, as they are compatible with ISQ readings as well. For example, if novels are the topic of discussion and thus already familiar in the context of utterance, (53) is compatible with a genuine request for information. However, the elicitation data show a high frequency of the two structures in RhQs, and comparatively higher than for ISQs. This raises the question of how they are related. As for RD, I suggest that there is an indirect link based on the relation to the CG. By their nature, RhQs suggest that the answer to the question is already present or inferable from the CG; in (55), the speaker, by uttering the question "Who reads novels?!" conveys the presupposition that the answer "No one reads novels" is entailed in the CG and already accessible to all participants (Biezma and Rawlins 2017). As a result, the link to the CG that

licenses the RD is established by default. Thus, the speaker is presenting the answer to the question as shared knowledge, using RD to (indirectly) link to this common knowledge (see Berruto 1986; Crocco 2013 for similar uses of RD in other contexts).

Cleft constructions are commonly associated with a contrastive/corrective focus and are presuppositional in nature (see Belletti 2012 for Italian clefts). In particular, the clefted constituent is focalized and the subordinate clause is presupposed. Constructions like (54), where the clefted constituent is the *wh*-element (*cleft interrogatives*), are attested in Italian ISQs. The occurrence of this construction in RhQs may be in some way connected with a special interaction between the *wh*-element in RhQs and focus¹⁹. An analysis of this kind, however, is complicated by the observation that cleft questions are preferred, or are even the obligatory strategy, to form a subject question in some northern Italian varieties (Poletto and Vanelli 1995). One may predict that clefted ISQs are only present in regional varieties of Italian to which this dialectal property has been transferred. However, cleft sentences were produced at comparable rates across varieties and were not restricted to Northern speakers. Thus, a deeper investigation of the interaction between focus structures and RhQs is in order.

2.3.4.5 *Speaker attitude*

Several cues relate to the speaker's attitude (in addition to those mentioned in this section below, the reflexive with affective use discussed in 2.3.4.3).

Firstly, we find aggressive expressions (3%) in three forms: *cazzo* (vulg. 'male organ') (55), *cavolo* (lit. 'cabbage', an attenuation of the former) (56) and *diavolo* (lit. 'devil', equivalent to 'the hell'). These expressions immediately follow the *wh*-expression, modifying it, a configuration known as 'aggressively non-D-linked *wh*-phrases', which have been extensively analysed for English *wh-the-hell* (Pesetsky 1987; Dikken and Giannakidou 2002; Celle, Jugnet, and Lansari 2021). Questions whose *wh*-word is modified by *the-hell* have an expressive value: they can express surprise or disapproval, and they can be rhetorical.

¹⁹ Analogously, some authors claim that RhQs can be characterised by a strong prosodic break after the *wh*-constituent (e.g., Benincà 2001; Obenauer and Poletto 2000).

- (55) *Ma [chi cazzo] legge i romanzi?!*
 but who AGGR read.3SG the novels
 ‘Who the hell reads novels?!’
- (56) *[Chi cavolo] si mangia il lime?!*
 who cabbage REFL eat.3SG the lime
 ‘Who the hell eats lime?!’

Dikken and Giannakidou (2002) identify two meaning contributions for *wh-the-hell*: *domain extension* and the *presupposition of a negative attitude*. First, *the-hell* modifies the domain of quantification of the *wh*-word, which is normally a contextually determined subset of all possible entities, to the entire domain of entities identified by the *wh*-word itself²⁰.

The second contribution is the presupposition of a negative attitude towards the propositional content of the question, formalized as a modalized conditional statement: the presupposed meaning roughly corresponds to ‘if any *x* did what is expressed in the proposition, *x* should not have done it’ (Dikken and Giannakidou 2002). Alternatively, Celle, Jugnet, and Lansari (2021) attribute the expressive meaning to intensification, as codified by Beltrama and Trotzke (2019). Through emphatic intensification, an element is placed on the highest or lowest range of a scale. In the case of aggressive expressions, the intensification applies to the speaker’s attitude: it may apply to a scale of ignorance, returning a *Cfv*-reading (expressing their inability to find a reasonable answer to the question), or a scale of incongruity if the propositional content clashes with the speaker’s expectations. This produces a counter-expectational or surprise-disapproval interpretation (Celle, Jugnet, and Lansari 2021). Example (57) may be interpreted either way – crucially, however, it cannot be interpreted rhetorically: the speaker knows that there must be some person *x*, such that *x* bought the album, because there is direct evidence for it.

²⁰ If I am talking to a friend about a dinner organised by our colleagues and I ask *Who came to the dinner?*, the domain of possible individuals that may be part of the answer is implicitly restricted to our colleagues. The question can be paraphrased as ‘which *x*, *x* being a person, and *x* belonging to the set of our colleagues, came to the dinner?’. With *the-hell*, the *wh*-word is not D-linked, i.e., its domain is extended to any possible individual, not to a contextually given subset. Thus, in *Who the hell came?*, the interrogative pronoun *who* can be paraphrased as ‘For any *x*, *x* being a person’, referring to any individual in the universe.

(57) Anna and Berto are in a music shop. They both think the pop band Atchoo is terrible. However, they see that all Atchoo albums are sold out.

A: *Chi cavolo ha comprato l=album de-gli Ecciiù?*
 Who AGGR has bought the=album of-the Atchoo
 ‘Who the hell bought the Atchoo album?’

It may be argued, then, that *wh-the-hell* is incompatible with RhQs (as Hinterhölzl and Munaro 2021, 55 do). However, such expressions do occur in my sample, sometimes with a combination of cues that qualifies the question as unambiguously rhetorical, as in (58), which refers to the positive-answer context. The possibility of having an aggressive expression in a RhQ is confirmed by the application of the yet-clause test, as in (59) for a negative-answer RhQ and in (60) for a positive-answer one. If a question is followed by a yet-clause, it can only be a RhQ, because the use of *yet* implies that the speaker is committed to the previous utterance (Caponigro and Sprouse 2007)²¹.

(58) *E chi cazzo vuoi che sia stato?!*
 and who AGGR want.2SG that be.SBJV.3G been
 ‘And who do you think it was?!’

(59) Anna and Berto own a music shop. Anna is complaining to a friend about Berto’s poor business decisions.

A: *Chi cavolo li compra i CD degli Ecciiù? Eppure, Berto ne ha ordinati venti.*

‘Who the hell buys Atchoo albums? And yet, Berto bought twenty of them.’

(60) Carlo and Giulia go dancing at the Barbar every Saturday night, and their friends are aware of this. One Saturday evening, Anna and Berto are talking about them.

A: Carlo and Giulia are not at home. I wonder where they went.

B: *Dove diavolo vuoi che siano andati? È sabato sera!*

‘Where the heck do you think they are? It’s Saturday night!’

²¹ Confirmation is found also in spontaneous examples. In (i), taken from a podcast, the surrounding context confirms that the question is meant as purely rhetorical (‘it is obvious that no one else is going to marry Anne’). The Italian equivalent would be equally acceptable.

(i) "Lady Catherine is operating from fear about her daughter. If her daughter doesn't marry Darcy, then who the hell else is Anne going to marry? Anne's not going to meet anyone, she is too sick to leave the house."
 (Zoltan and Sandler 2022)

(after Hinterhölzl and Munaro 2021, n. 9)

The examples in (58) and (60) may be puzzling, because, if an aggressive expression raises a negative inference towards the proposition, we expect it to be compatible only with negative-answer, and not positive-answer RhQs. In this vein, Celle, Jugnet, and Lansari (2021) propose that in RhQs the emotive intensification works by strengthening the negative bias to an extreme. Thus, the felicity of (60) may be taken to challenge this assumption. However, at closer scrutiny the interpretation of *wh-the-hell* in (60) is slightly different than in the other examples. Here, the speaker does not express a negative attitude towards going to the club, nor ignorance of the entities that may fill the *wh*-variable. Rather, the negative attitude is directed towards the addressee's previous utterance. It may be that in some cases the negative attitude expressed by *wh-the-hell* in some circumstances applies not to the proposition, but at the utterance level. I leave this open for further investigation.

In conclusion, an aggressively-non-D-linked expression contributes to the meaning of a RhQ by signalling that the speaker has a negative attitude towards the propositional content of the question, the possible answers to it or towards an element in the discourse to which the question reacts. It is normally associated with a negative intended answer, but in the latter circumstance it may also be compatible with a positive-answer RhQ.

A second instance of attitude-expressing cues are interjections, that could be generically translated in English with 'come on': *dai, ma dai, oh, eh, ma no, scusa, ma scusa*. These elements all encode a disagreement of the speaker with the interlocutor or with the previous context. Note that some of these elements are introduced by *ma*. This *ma* modifies only the interjection and can co-occur with the discourse particle modifying the main clause, as in (61).

- (61) **Ma dai, ma chi legge i romanzi?!**
 but PRT but who reads the novels
 'Come on, who reads novels?!'

2.3.4.6 Call on the addressee

Several RhQs present elements or structures that, in different ways, express a call on the addressee. The first is *secondo te* 'according to you', 'in your opinion' (62) (3%). In an ISQ, this expression obviously enquires about the speaker's opinion. In RhQs, however, this function cannot be preserved, as the function of the question is the opposite. Similarly, the

propositional content of the RhQ (i.e., the portion of meaning that is indicated as obvious), can be embedded under a verb such as *pensare* ‘think’ or *credere* ‘believe’ (2%), literally expressing a request for what the hearer thinks or believes, although this request is made void by the rhetoricity of the question (63) and may rather be interpreted as a challenge to the interlocutor.

(62) *Ma secondo te, chi ha tempo di leggere?!*
 but according.to you who has time to read
 ‘Who has time to read?!’

(63) *Ma chi pensi che mangerà mai il fegato?!*
 but who think.2SG that eat.FUT.3SG ever the liver
 Who do you think will ever eat liver?!’

Another embedding construction is formed with the verb *volere* ‘want’ (64) (6%). The embedding has the same form as with *pensare* and *credere* – the question is embedded under the verb and the wh-word is extracted from it; the main verb is in the second person singular; the embedded verb is in the subjunctive form – but this particular form assumes a formulaic rhetorical reading. Unless a question with this construction is interpreted literally in the context, as a request to the addressee to choose something (in (64), a request to choose someone in the context to drink the tea), the verb *volere* loses its lexical meaning and the embedding construction becomes a fixed expression indicating that the embedded question is rhetorical (see Obenauer 2004 for an analysis of this construction in the Italo-Romance variety Pagotto; its presence is mentioned in other Romance languages such as Spanish and Catalan). The same periphrasis is also possible with RhQs with a positive-answer RhQ, as shown in (58) above²².

(64) *Ma chi vuoi che beva la tisana?!*
 but who want.2SG that drink.SBJV the herbal_tea
 ‘Who (do you think) drinks herbal tea?!’

²² Compare Hinterhölzl and Munaro (2021, fn. 4), who mention this construction as typical only for positive-answer RhQs and not for negative-answer ones.

Unlike other cues reviewed above, the ‘want’-embedding does not seem to be ambiguous with other interpretations, such as Cfv-questions or surprise-disapproval questions. Rather, it is genuinely rhetorical, i.e., used specifically to point out that the answer should be obvious. However, its use is contextually restricted, as it is not felicitous in every RhQ. Consider the context in (65). Here the speaker knows for certain that the interlocutor knows the results of last year’s election. In this case, embedding under ‘want’ is not felicitous (65b). The infelicity is not extended to all RhQs, because the equivalent in (65a), with the interpretation ‘it was Vittoria who got 10.000 votes last year’, is felicitous in this context. The ‘want’-embedding is felicitous in (66) instead. Here, the interlocutor signals that they do not know who the new mayor is and, consequently, who obtained ten thousand votes. Speaker B, in uttering the RhQ, signals that the answer is obvious to him, and it should be obvious to the addressee too, inviting her to draw the same inference.

(65) Anna and Berto are members of the town council. They are discussing who to nominate for the next election. Berto wonders whether Vittoria is a good candidate.

A: Of course we should nominate Vittoria!

a. *Chi è che ha preso 10.000 voti l=anno scorso?*
 who is that has taken 10.000 votes the=year past

b. #*Chi vuoi che abbia preso 10.000 voti*
 who want.2SG that have. SBJV taken 10.000 votes
 l=anno scorso?
 the=year past

‘Who got 10.000 votes last year?’ [= Vittoria did]

(66) Anna and Berto read a news headline: “The new mayor was elected with 10.000 votes”.

A: They don’t say who the new mayor is.

B: *Chi vuoi che abbia preso 10.000 voti? Vittoria è*
 who want.2SG that have. SBJV taken 10.000 votes
 l’unica così popolare!

‘(I mean), who do you think got 10.000 votes? Only Vittoria is this popular.’

RhQs are usually defined as a question whose answer is already shared by speaker and addressee. The speaker may use a RhQ to recall this fact, but also to point out that the

answer should be obvious even though the addressee has expressed ignorance before. The ‘want’-embedding is only felicitous in this second case: it requires a context in which the speaker cannot take for granted that both speaker and addressee are mutually committed to the intended answer²³. In conclusion, embedding under ‘want’ is not felicitous in all types of RhQs, but when it is present, it is a reliable marker for the rhetoricity of the question.

2.3.4.7 Lexicalization of context

To conclude this overview, it is relatively common (25%) to find lexical expressions within the question that signal its rhetoricity by lexicalizing some contextual elements that point to the intended answer, making the reason why it is obvious explicit (see also Neitsch 2019, 5). For example, in (67), by adding the phrase *al giorno d’oggi* ‘nowadays’, the speaker points to the presumed shared knowledge that learning poems is not something that belongs to the present (and therefore no one does it).

- (67) *Ma chi le impara al giorno d’oggi, le poesie?!*
 but who CL learns nowadays the poems
 ‘But who learns poems nowadays?!’

2.4 Discussion

In Section 2.3, I have analysed several cues that may be used to mark RhQs in Italian, building on the results of an elicited production experiment. Among them, only one, i.e., embedding under the verb ‘want’, proved to be a fully reliable marker of rhetoricity: if the speaker does not know whether the addressee is committed to the rhetorical point, they can use want-embedding to signal that the addressee should draw the conclusion that the intended answer is obvious. This cue can be used to signal both a positive and a negative answer.

The other cues were instead ambiguous with other kinds of non-canonical (or even with canonical) questions, deriving the rhetorical interpretation indirectly, through composition with other cues or in combination with the context. The sentence-initial particles *ma* and *e* link the question to the discourse, *ma* with a counter-expectational and

²³ This formulation of the constraint on the use of *want*-embedding is limited to the author’s intuition. A more precise definition should be further explored and backed by adequate experimental evidence.

e with an additive function. Both convey a conflict with the context of utterance; thus, they are only felicitous in an RhQ if it is used to address such a conflict. The target contexts of elicitation were compatible with this reading, in presenting a situation that the protagonist found absurd and to which they replied with an RhQ akin to a sarcastic comment.

Cleft structures and RD too result from the interaction with the context, from the point of view of information structure. A conditional verb introduces an *irrealis* modality and modalises the question relative to a set of possible worlds, providing this modalisation to other cues or occurring on its own; in this case, it helps the rhetorical interpretation but is strongly dependent on the context to be interpreted as rhetorical. The adverb/particle *mai* is also not exclusively rhetorical, but its occurrences in the corpus are not compatible with a canonical reading. It can convey either rhetoricity or extreme ignorance (Cfv-reading), and it can occur in different syntactic configurations. When it appears in adverbial position, it is always in combination with the conditional; this combination produces at minimum a Cfv-reading. When it is used a discourse particle, it operates on the *wh*-variable, again producing a Cfv or a negative rhetorical reading.

Other cues express the speaker's emotive attitude (the affective reflexive, aggressive expressions, and interjections) or their interaction with the addressee (*secondo te*, embedded constructions, possibly future tense). In particular, an aggressive expression introduces a negative emotive attitude on the part of the speaker, through the means of emphatic intensification. This negative attitude naturally triggers a surprise-disapproval reading, but it can translate to a Cfv-reading or a rhetorical one; typically (but not exclusively) pointing to a negative answer.

A common denominator for these cues is that the rhetorical reading is built upon an inference of negative bias or attitude of various kinds. Let us once again consider the combination of *mai* and conditional. In (68), this configuration signals that the speaker has considered all possible answers to this question. They may then use the question to signal the inability to find the answer (Cfv-interpretation), or to signal that no answer is possible, and the addressee should agree on this fact (RhQ-interpretation).

- (68) *Chi mangerebbe mai i broccoli?*
 who eat.COND.3SG ever the broccoli
 'Who would ever eat broccoli?'

This creates an asymmetry between positive-answer and negative-answer RhQs. Positive-answer RhQs have a more restricted characterisation and are less prone to ambiguity with other non-canonical questions. In this type of RhQs, the speaker highlights one specific non-null answer, which needs to be retrievable from the context of utterance. Consider (69). Here, the form of the question is unambiguously rhetorical, but for the intended answer to be interpreted correctly, the addressee needs to possess the contextual elements that could allow them to understand who the speaker is referring to.

- (69) *Chi vuoi che abbia rotto il vaso?*
 who want.2SG that have. SBJV broken the vase
 ‘Who do you think broke the vase?’

Negative-answer RhQs are partially different. Here, the negative rhetorical interpretation can arise in different ways. As a first possibility, we can posit a process analogous to the one sketched for positive-answer RhQs: the speaker directly points to the negative answer being the obvious true answer given the context. In (70), the only way to know whether the speaker means ‘Obviously no one drinks herbal tea’ or ‘Obviously person x drinks herbal tea’ is to know the context.

- (70) *Chi vuoi che beva la tisana?!*
 who want.2SG that drink. SBJV the herbal_tea
 ‘Who drinks herbal tea?!’

The second possibility is that the inference of an obvious negative answer may arise by intensifying various kinds of negative bias and attitude, as outlined above. The speaker conveys the idea that there is no possible positive answer to the question because they are biased against all of them, or they can’t find an adequate value, and so they do not believe that it exists. In this second case, the fact that the question is meant as rhetorical may have to be inferred from the context, but the intended answer, i.e., it being a negative one, is inscribed in the form of the question. This second possibility leads to the observed contiguity between RhQs and biased, surprise-disapproval and Cfv-questions – and possibly other types of non-canonical questions that have not been taken into consideration here.

In consequence, sometimes the exact type of pragmatic meaning remains underspecified and is prone to ambiguity. Consider (71). Speaker B’s responses are on a

scale of ambiguity. The response in (71a) is completely ambiguous, and could be equally interpreted as canonical, surprise, Cfv or rhetorical based on the speaker's intonation or further contextual information. Answer (71c), on the contrary, is unmistakably rhetorical. (71b) is something in between. It is not simply a canonical request for information, because of the presence of *wh-the-hell*. But it could be a RhQ, a surprise question, a Cfv-question. While, again, the disambiguation may be offered by prosody, its exact interpretation may as well remain unspecified in this context.

(71) Anna and Berto both work at the Linguistics department.

A: We are going to offer a Klingon class in our Linguistics curriculum.

B: a. *Who wants to learn Klingon?*

b. *Who the hell wants to learn Klingon?!*

c. *Who the hell is going to attend your class on a fake language, Anna?!*

2.5 Conclusion

The goal of this chapter was to explore the form of RhQs in colloquial Italian, focusing on the elicitation of lexical and morphosyntactic markers. The results of the elicited production experiment offered a complex picture. There does not seem to be one specific reliable cue to mark rhetoricity across conditions in Italian. On the one hand, strong(er) cues such as *mai*+conditional and periphrastic 'want'-embedding were not used frequently and are contextually restricted. On the other hand, some cues occurred frequently, but they are weaker signals of rhetoricity, being compatible with other types of non-canonical questions, or even with canonical questions. Overall, RhQs were confirmed as an inherently pragmatic phenomenon, and that their linguistic form is heavily determined by the context.

A final remark concerns the interaction with prosody. So far, I have investigated the morphosyntactic and lexical forms of RhQs. However, non-canonical questions in general and RhQs in particular can also be marked by some intonational and prosodic cues that set them apart from ISQs. Prosodic cues range from phonological (intonational) configurations to phonetic correlates, such as pitch range, duration and voice quality. These cues have varied functions and can mark the same aspects examined above: speaker's attitude and emotion, information structure, interaction with the addressee. Thus, prosody is expected to play an important role in the acquisition of RhQs. While the investigation of RhQ prosody

production is not included in this work, its role will be taken into consideration in Chapter 3 for comprehension.

In the remainder of the chapters, I turn to the acquisition of RhQs in Italian. In Chapter 3, I address the comprehension of lexical-syntactic and prosodic cues in RhQs by bilingual and monolingual children. In Chapter 4 and Chapter 5 I look at the acquisition of lexical-syntactic cues in production, for monolingual and bilingual children respectively.

Chapter 3. RHETORICAL QUESTION COMPREHENSION IN MONOLINGUAL AND BILINGUAL CHILDREN

Parts of this chapter were published as Ferin, Maria F., and Miriam Geiss. 2022. 'Investigating Rhetorical Question Comprehension in Italian by Italian-German Bilingual Children'. *Lingue e Linguaggio* 21 (1): 29–51.

3.1 Introduction

In Chapter 2, I have analysed in detail how RhQs, as in (72), are non-canonical questions, since they do not request information, but are rather used to signal the speaker's epistemic and emotive attitude towards the implicit answer. In order to interpret a question as rhetorical, it is necessary to be able to interpret the non-literal meaning and to understand the speaker's intent, as well as to process the linguistic cues that each language uses to mark them. Apart from lexical-syntactic cues, many languages use prosody to mark rhetoricity. In general terms, prosody serves both linguistic functions (e.g., marking phrase boundaries, clause typing) and paralinguistic functions (e.g., speaker's intention, emotions), both of which are relevant for RhQs.

(72) *Who eats broccoli for breakfast?!*

Presupposed answer: No one eats broccoli for breakfast.

Children, unlike adults, rely more on the literal meaning of an utterance than on the (para)linguistic cues that convey the non-literal meaning: the ability to interpret utterances where the literal and the intended meaning are discrepant (such as ironic and sarcastic statements, which are similar in some respects to RhQs) is still under development in primary-school-aged children (Capelli, Nakagawa, and Madden 1990; Glenwright et al. 2014). However, there is some evidence that this ability evolves earlier in bilingual children (see Yow and Markman 2015 for emotion recognition).

In this chapter, I investigate the comprehension of Italian RhQs by monolingual children and by Italian-German bilingual children living in Germany, acquiring Italian as a HL and German as the ML. In order to correctly interpret a question as rhetorical, a child has to learn (i) that a question may be used for something different than a request of information, (ii) the language-specific cues that may be used in the target language to signal the rhetoricity of the question, (iii) how to correctly interpret those cues and integrate them with the context in order to get to the correct interpretation. Bilingual children, additionally to learning the concept of RhQs, have to learn the set of linguistic cues that mark them in both their languages, which can lead to interaction between the two languages and CLI. At the same time, the two languages in bilingual children are hardly ever balanced, and they do not receive the same amount of input and use. Especially when they acquire a HL in the

family and the ML of the society, in general the latter eventually becomes the dominant one (Polinsky 2018).

The main goal of the chapter is to investigate if primary-school-aged children are able to understand RhQs presented without a context, solely based on their linguistic form, and whether they have acquired the linguistic cues that mark RhQs in Italian. For bilingual children, in particular, the question is whether children have acquired the relevant cues in their HL, whether their level of proficiency and experience with the HL plays a role, and whether knowledge of German could potentially play a role.

This chapter is structured as follows: in Section 3.2, I provide an overview of RhQs in Italian as well as the relevant literature on emotion and irony recognition through prosody. In Section 3.3 I discuss the research questions and the corresponding predictions for this study. Section 3.4 and 3.5 report the methodology and the results of the comprehension study respectively, which are discussed in Section 3.6.

3.2 Background

3.2.1 RhQs in Italian

As was extensively discussed in Chapter 2, RhQs have an interrogative form, but they have a different discourse function than ISQs: they do not require nor expect an answer from the addressee (e.g., Banuazizi and Creswell 1999; Biezma and Rawlins 2017; Han 2002) because the speaker believes the answer to be in the CG shared by the speaker and the addressee (Caponigro and Sprouse 2007). Thus, RhQs feel more like an assertion than a question, and they are used for a variety of communicative functions. For instance, a RhQ may be used as a sarcastic comment on a situation, or to reinforce a previous opinion (Neitsch 2019; Sorianello 2019). RhQs vary also in the type of intended answer, which can be of the opposite polarity as the question itself (negative-answer RhQs) or of the same polarity (positive-answer RhQs). To avoid possible confounding variables, the study is restricted to a specific sub-type of RhQs, that is, wh-questions with an intended negative answer of the type exemplified in (72), contextually interpreted as a sarcastic comment (see 1.2).

In order to understand RhQs, it is necessary to comprehend the literal meaning and to interpret its intended meaning at the same time; in this respect, RhQs behave similarly to ironic or sarcastic statements (see Neitsch 2019, 46–52). In Italian, it is possible to create

string identical RhQs and ISQs, as in (72): ‘Who eats broccoli for breakfast?’, whose illocution type may be disambiguated through several means. The first type of cues are world-knowledge and context (e.g., in (72), the speaker and hearer live in a context in which broccoli are not a breakfast food). This type of cue is language universal.

A second type of cue is constituted by prosody in various forms. While the selection of prosodic cues that correlate with RhQs seems to be language-universal (duration, voice quality, pitch range, intonation) their implementation is language-specific (Dehé et al. 2022). To date, the only studies available on the prosody of RhQs in Italian were conducted by Soriano (2018; 2019; 2020), who focused on the Southern-Italian variety spoken in Bari²⁴.

According to Soriano (2018; 2019), duration and pitch excursion are two phonetic cues to rhetoricity: RhQs display a longer duration of the final stressed vowel and the pitch excursion is smaller in RhQs than in ISQs. Phonologically, wh-RhQs end more often with a low boundary tone (L%²⁵), as opposed to the high (H%) or rising boundary tones (LH%) found in ISQs. Soriano (2020) further investigated the comprehension of RhQs prosody, showing that questions could be classified as rhetorical or information-seeking based solely on their prosody, but only to a certain degree, as judgments were not categorical. Further, Soriano showed that manipulating a question’s duration and the shape of the final contour (flat vs rising) affects the speakers’ decision whether a question is rhetorical or not. However, in this experiment, only polar questions were considered, and it has been shown that the prosody of polar ISQs and RhQs differs from that of wh-questions of both types (e.g., Braun et al. 2019 for German; Soriano 2018 for Bari Italian).

Finally, RhQs can be marked by means of lexical and morpho-syntactic markers (see Section 2.3.4), such as discourse particles, verbal morphology or other discourse markers. Some cues are stronger indicators of rhetoricity, such as the adverbial particle *mai* ‘ever’, especially in combination with a conditional verb, and the periphrastic embedding under the verb *volere* ‘want’. However, these stronger cues were not frequent in the examined corpus of elicited RhQs (Ferin 2024; Chapter 2). On the contrary, some weaker cues marked

²⁴ A prosodic analysis of RhQ prosody in Italian tied to project P10 is ongoing (e.g. Ferin, Sbrana, and Albert forthcoming).

²⁵ The annotation of intonational phonology follows the ToBI conventions for Italian (Avesani 1995; D’Imperio 2002; Gili Fivela et al. 2015; M. Grice et al. 2005)

RhQs much more frequently; in particular, the counter-expectational particle *ma* ‘but’, which signals some conflict in the context of utterance (Giorgi and Dal Farra 2019; Ippolito 2021).

Additionally, RhQs often include RD of a relevant constituent (2.3.4.4). RD marks a familiar topic, and as such it is also present in ISQs. The relation between RhQs and RD as an information structure device probably lies in the givenness of the answer and its status in the CG, by which the speaker points to the indirectness of the answer. In any case, this structure cannot be considered a strong marker for rhetoricity, but rather an indirect correlate to it.

As in Italian, prosody is an important cue to rhetoricity also in German, the ML of the bilingual children in this study. German wh-RhQs can be marked by a longer duration, a breathy voice quality and a rising nuclear pitch accent (L* + H) which differentiate them from ISQs (mostly L + H*). Boundary tones are low (L-%) in RhQs, but also in ISQs (Braun et al. 2019). As lexical-syntactic cues, German often marks RhQ with discourse particles, such as *denn* or *denn schon* (Dehé, Wochner, and Einfeldt 2022; Meibauer 1986).

3.2.2 The acquisition of RhQs: state of the art

To date, Recchia et al. (2010) is the only study that investigated RhQs in the context of language acquisition. Given the scarcity of research on the topic, in this section I will also review the literature on the comprehension of emotion recognition through prosodic cues as well as irony comprehension in monolingual, and, whenever available, bilingual children.

Recchia et al. (2010) investigated the production and comprehension of several forms of irony in a naturalistic setting, among which they also include RhQs²⁶. They analysed the spontaneous productions of 4- and 6-year-old pairs of siblings and of their parents in the home environment, coding both their productions of different types of ironic language and the type of response to these productions. Their results suggest that 4- and 6-year-old

²⁶ Notice, however that the authors' definition of a RhQ in this paper appears to be wider than the one adopted here: «A question for which an explicit answer was not expected (most often, a behavioural response was expected in its place), or for which the content of the question was incongruent with the interaction context» (Recchia et al. 2010, 262, Table 1). This definition would include also other types of non-canonical questions, such as Cfv and surprise-disapproval questions. For instance, I interpret the example reported in Table 2 Recchia et al. (2010, 264) as an ironic or jocular use of a question, rather than a RhQ.

monolingual children are at least partially able to understand RhQs in spontaneous speech: children often responded in a way that suggested that they were not interpreting the question as a literal request for information. The ability to understand RhQs improves with age (i.e., the 6-year-olds were better than the 4-year-olds). Difficulties arose mainly from understanding the conversational function of RhQs, as suggested by children's responses or reactions to adults' rhetorical questions. Recchia et al. (2010) speculate on the importance of family conversations for developing the ability to understand ironic language, including RhQs, as the children might have benefitted from the frequent use of RhQs by their parents. However, the data did not allow testing for the relationship between parents' and children's use of ironic language. Furthermore, the authors only analysed the conversational appropriateness of the children's interactions but did not investigate whether children were sensitive to any additional cue (prosodic or lexical-syntactic) marking RhQs.

Studies on phenomena which are in some respect similar to RhQs, such as irony and sarcasm comprehension, show similar results. Monolingual and bilingual children around the age of 6 are able to understand irony and sarcasm (Banasik 2013 for monolingual Polish children; Banasik and Podsiadło 2016 for bilingual Polish-English children). Prior to this age, at least monolingual children have a tendency to interpret utterances literally (Ackerman 1982; Banasik 2013). In addition, studies on monolingual children suggest that successful understanding of irony and sarcasm is mediated through contextual information (Ackerman 1982), theory of mind development (Banasik 2013) and intonation (Capelli, Nakagawa, and Madden 1990; Glenwright et al. 2014).

As outlined above, prosodic cues can be used to disambiguate RhQs from (string identical) ISQs. In addition, since RhQs signal the speaker's attitude or belief towards the answer (Biezma and Rawlins 2017) and serve a variety of communicative functions (e.g., criticism, sarcasm) (Soriano 2019), the ability to decode them is closely intertwined with the recognition of emotions through paralinguistic cues (e.g., speaking rate, voice quality, intonation). Previous studies show that infants are sensitive to differences in prosodic patterns (Frota, Butler, and Vigário 2014; Geffen and Mintz 2011; Soderstrom, Ko, and Nevzorova 2011). However, an early sensitivity to prosody does not imply that the categories to which prosodic forms are mapped have been acquired. Studies on emotion recognition through (para)linguistic cues show that the relevant categories are still developing in primary-school aged children. This development becomes evident when studying children's ability to infer emotions, when literal meaning and paralinguistic cues are

discrepant. At the age of four, children typically judge speaker's emotions based on what they said and not on how they said it (Friend 2000; Morton and Trehub 2001). Between 7 and 9, children start to show greater sensitivity to vocal cues and by the age of 10, they can infer the speaker's emotion primarily through paralinguistic cues (Friend 2000; Morton and Trehub 2001). The study by Morton and Trehub (2001) suggests that 4-year-olds have acquired the paralinguistic cues, but they needed more time to learn to weigh them over lexical or situational cues (Armstrong and Hübscher 2018).

Studies on emotion recognition in bilingual children suggest that the ability to weigh paralinguistic cues over lexical cues emerges earlier in bilingual compared to monolingual children. For example, the study by Yow and Markman (2011) investigated monolingual and bilingual children aged 4 with the same stimuli as Morton and Trehub (2001). They replicated the findings of Morton and Trehub (2001) for monolingual children, finding that they also relied on content in the presence of conflicting contexts. The bilingual children in Yow and Markman (2011), however, used paralinguistic cues over content, although still not in an adult-like manner. The authors attribute this earlier use of paralinguistic cues to a higher inhibitory control or a higher awareness to cues in general. Champoux-Larsson and Dylman (2019) go one step further in reporting a prosodic bias in bilingual children. In their study, bilingual children aged 6 to 8 were asked to identify the emotional valence of words. The bilingual children in their study had more difficulties ignoring the prosodic cue when identifying the semantics of the word, thus showing a prosodic bias.

Overall, previous research has demonstrated that (para)linguistic cues play an important role in emotion and irony recognition and presumably also in RhQ recognition, especially because intonation can be used to disambiguate RhQs from ISQs. To date, no study has investigated how monolingual and bilingual children of different ages understand RhQs and when they acquire the relevant linguistic cues discussed in the literature, whether prosodic or lexical-syntactic.

3.3 Research questions and hypotheses

In light of the aforementioned gaps in previous research, I addressed the following research questions (RQs):

- **RQ1** Can monolingual and bilingual children at primary school age interpret RhQs in their HL? Is there an age development over this period?

- **RQ2** Which linguistic factors (prosodic, lexical-syntactic cues) affect RhQ comprehension?
- **RQ3** To what extent do irony comprehension, language proficiency, as well as age of onset and language dominance for bilinguals, play a role in the acquisition process?

With respect to RQ1, given that children acquire irony and the ability to use (para)linguistic cues for emotion recognition around the beginning of primary school, I expect that children may have started acquiring the relevant cues at age 6, with an improvement from age 6 to age 9. Therefore, a high rate of individual variation is expected.

Regarding RQ2, I expect that at least some, but not all children will be able to discriminate RhQs and ISQs based solely on their prosodic form. Given that in natural language RhQs are often signalled by a combination of prosodic and lexical-syntactic cues, I expect that the combination of the two types of cues will be more effective than prosody alone, and thus more easily interpretable for children.

RQ3 addresses the role of several potential correlates. Firstly, I expect irony comprehension to correlate with the acquisition of RhQ comprehension equally for monolingual and bilingual speakers. If the same process of emotion recognition and of interpretation of non-literal meaning are involved in both cases, the child's ability to interpret both irony and RhQs should go hand in hand. Secondly, I expect language proficiency and language experience to correlate with bilingual children's comprehension. Bilingual children's acquisition of their languages is often influenced by their level of language dominance, i.e., by the relative "strength" of each language in relation to the other (Montrul 2015; Treffers-Daller 2019). Dominance is a multidimensional concept, and it can be operationalized in different ways: either through direct measures of linguistic proficiency, or by measuring the amount of linguistic experience (exposure and use) in the bilingual's two languages (Benmamoun, Montrul, and Polinsky 2013; Montrul 2015; Treffers-Daller 2019). In this study, I will consider both dimensions in different ways. Linguistic proficiency in the HL is used as standalone, and not relativized to proficiency in German, in order to compare bilingual and monolingual children on the same measures. Language experience, on the other hand, is used as a measure of dominance, by putting in relation the relative amount of experience in Italian and in German. This way, bilingual children's dominance profile will be taken into account.

I expect lexical proficiency and speech rate to play a role in bilingual but not in monolingual children's comprehension: only for bilingual children are these expected to correlate with different levels of proficiency in the HL, resulting from different levels of language experience and other variables. I expect dominance, operationalized on the basis of language experience, to play a role in the bilingual children's performance in the task. In particular, children whose experience with Italian is relatively richer are predicted to be more exposed to the relevant type of evidence.

Finally, I do not expect AoO of the ML to have a (strong) effect on RhQ comprehension: Given the complexity of the phenomenon and the timeline of acquisition for similar phenomena (e.g., irony), which are acquired later in childhood, the age at which children start being exposed to the ML should not matter. Rather, what should matter is how much experience children have with the language in the relevant acquisition period (see Tsimpli 2014 for 'late' and 'very late' acquired phenomena, and Chapter 5 for in-depth discussion).

3.4 Method

The study investigates the comprehension of RhQs in Italian by monolingual children in Italy and by Italian-German bilingual children growing up in Germany. All children took part in two tasks, a Perception and a Comprehension task. The bilingual children were tested in both of their languages on different days. Herein, I focus on the results of the Italian task (see Geiss et al. 2023 for a comparison of bilingual children's performance in the Italian and in the German task).

The goal of the Comprehension task was to investigate the effect of linguistic and extralinguistic factors on the recognition of RhQs. Linguistic factors internal to the phenomenon consist of prosodic and lexical-syntactic cues; other linguistic factors concern language proficiency, which was measured as vocabulary productivity and speech rate in a Narrative task. Extra-linguistic factors included the ability to understand irony, assessed by means of an Irony comprehension task, age, and, for bilingual children, AoO of German and language dominance, measured through a parental questionnaire. To ensure that the children could perceive the difference between the two prosodic forms that were used in the Comprehension task, a preliminary Perception task (utterance discrimination) was carried out.

Participants were recruited through personal contacts, social media, and with the help of schools, Italian consulates, and cultural associations. Parents were informed of the

purpose of the study and gave their informed consent; prior to the testing sessions, they filled in a questionnaire on the child's language history. After the last session participants received an electronic gift card for a bookstore chain (8€ for monolingual children, 16€ for bilingual children). The study and all related procedures were approved by the ethics committee of the University of Konstanz (IRB statement 14/2020). Children were administered a battery of tasks divided into two sessions. Bilingual children were tested in both languages, for a total of four sessions, with at least one week time between the two languages. Each session was between 20 and 40 minutes long.

Due to the restrictions on in person contact during the Covid-19 pandemic, the tasks were carried out online, via a Zoom videocall. The tasks were administered to children in a playful manner, inscribed within the setting of a fictional detective school. Children were recruited as “detectives in training” and awarded a detective certificate at the end of the two sessions. The purpose was twofold: firstly, to keep children engaged and minimize participant dropout between sessions; secondly, to offer a pragmatic motivation for the tasks to children.

3.4.1 Participants

The study was conducted with 88 Italian-German bilingual children and with 84 Italian monolingually raised children. They were divided into four age groups: 6-, 7-, 8-, and 9-year-olds. Bilingual children had been acquiring either both languages from birth (2L1) or they learned German as an early second language (eL2) (AoO 1-7). For an overview of the participant profiles, see **Table 2** for monolinguals and **Table 3** for bilinguals (the tables also report statistics on speech rate, VOCD irony and dominance scores that will be presented later). At time of testing, all bilingual children were living in Germany and all monolingual children were living in Italy. 15 6-year-olds still attended kindergarten, and the remainder attended primary school. Some children ($n = 33$) had one German-speaking and one Italian-speaking parent (mostly first-generation immigrants; seven were HSs of Italian themselves). For the others, both parents were Italian speakers, mostly first-generation immigrants ($n = 46$); in a few cases ($n = 9$) either one or both parents were HSs of Italian.

Table 2. Aggregated statistics for monolingual participants, divided by age group. f = female, m = male.

Age group	N	Age <i>M (SD)</i>	Gender	Speech rate <i>M (SD)</i>	VOCD score <i>M (SD)</i>	Irony score <i>M (SD)</i>
6-year-olds	24	6.5 (0.3)	14 f, 10 m	1.8 (0.4)	21.7 (6.5)	.95 (.10)
7-year-olds	21	7.6 (0.2)	9 f, 12 m	1.9 (0.3)	26.1 (5.4)	.96 (.07)
8-year-olds	20	8.4 (0.3)	15 f, 5 m	2.0 (0.3)	27.2 (4.8)	.98 (.08)
9-year-olds	19	9.5 (0.3)	7 f, 12 m	2.0 (0.4)	29.4 (6.6)	.97 (.04)

Table 3. Aggregated statistics for bilingual participants, divided by age group. f = female, m = male.

Age group	N	Age <i>M (SD)</i>	Gender	Speech rate <i>M (SD)</i>	VOCD score <i>M (SD)</i>	Irony score <i>M (SD)</i>	Dominance (experience) <i>M (SD)</i>
6-year-olds	25	6.4 (0.3)	16 f, 9 m	1.6 (0.4)	20.7 (5.8)	.87 (.16)	4.7 (4.2)
7-year-olds	22	7.5 (0.3)	11 f, 11 m	1.4 (0.6)	23.0 (8.4)	.92 (.15)	5.6 (4.0)
8-year-olds	18	8.7 (0.2)	12 f, 6 m	1.9 (0.3)	22.8 (5.7)	.99 (.04)	2.3 (6.1)
9-year-olds	23	9.5 (0.3)	7 f, 16 m	1.7 (0.4)	21.8 (6.5)	.98 (.08)	5.4 (5.8)

3.4.2 Background measures: language proficiency, language experience, irony comprehension

3.4.2.1 Direct measures of language proficiency: the MAIN narrative task

Two direct measures of linguistic proficiency were obtained from a Narrative task: vocabulary diversity and speech rate. Both are considered good proxies for measuring proficiency (Benmamoun, Montrul, and Polinsky 2013, 135; Montrul 2015; Treffers-Daller and Korybski 2015). Speech rate can be a good measure of proficiency because less proficient speakers will present more disfluencies (e.g., pauses, reformulations), as well as need a longer time for lexical access in production, and can thus be substantially slower than a control baseline (Benmamoun, Montrul, and Polinsky 2013). Vocabulary diversity can be measured in different ways, that tap into different dimensions: word recognition and comprehension measure receptive vocabulary knowledge, and differ from vocabulary production tasks (Treffers-Daller 2019). Among these, picture naming tasks are different from lexical diversity measures obtained from a speech sample: in the latter case, it is not simply the size of the vocabulary that plays a role, but also its retrieval in oral production.

The prediction is that less proficient speakers will be able to produce less diverse texts, i.e., texts with a relatively lower number of different words and with more repetitions of the same words (Treffers-Daller and Korybski 2015).

Speech rate and vocabulary diversity were extracted from a short narrative text, which was elicited using the *Cat* and *Dog* stories of the MAIN task (Gagarina et al. 2019; see <https://main.leibniz-zas.de>). The standard MAIN procedure was adapted for online testing. The experimenter shared a PowerPoint presentation with the child, showing the testing material. In the background, the child's production was recorded with the loopback function of the software Audacity (Audacity Team 1999) in WAV format.

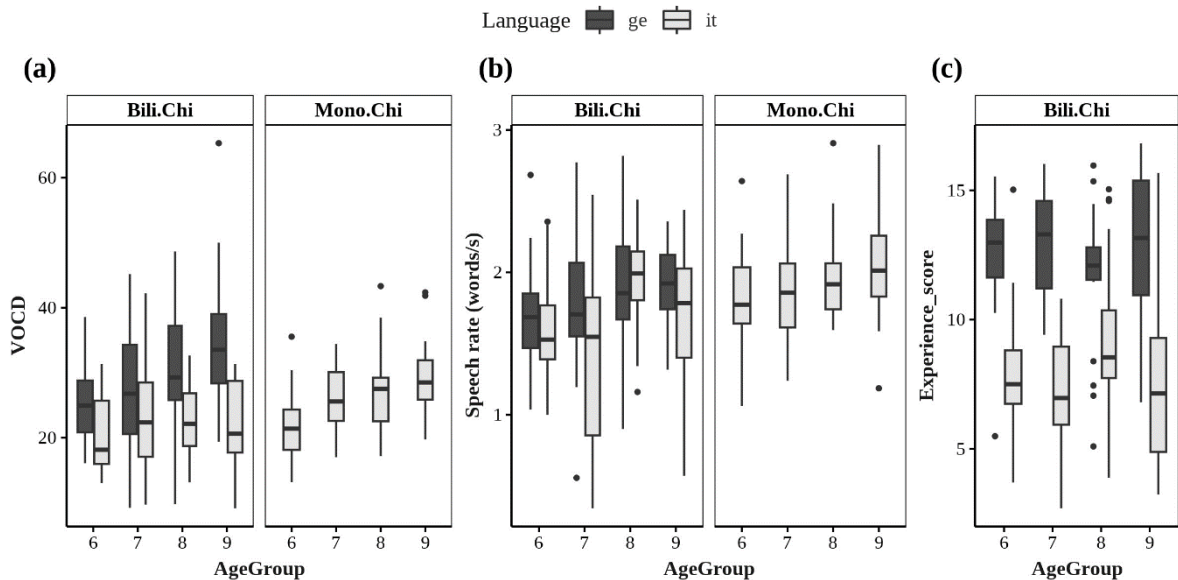
All children were administered the Italian version of the task (Levorato and Roch 2020); bilingual children were administered also the German version of the task (Gagarina et al. 2019). Children who retold the *Cat* story in German retold the *Dog* story in Italian and vice versa; the order of stories and of languages was counter-balanced across children. Each story is composed of six pictures depicting three narrative episodes, with a comparable structure across stories. Children were first familiarized with the pictures of the story; then, the pictures appeared two by two on the screen while the child listened to a recorded version of the story. Afterwards, the experimenter, who pretended not to see or hear the story, asked the child to retell it in their own words while looking at the pictures, which were again presented two by two (see Gagarina et al. 2019 for further details on the procedure).

The narratives were transcribed in CHAT format with the CLAN software (MacWhinney 2000). All transcripts were cross-checked by a second transcriber. Two measures of proficiency were automatically extracted with the KIDEVAL function: Vocabulary Diversity (VOCD) and speech rate (words/seconds). The latter was calculated by dividing the total number of words by the duration in seconds of each narrative, excluding pauses between utterances. For bilingual children, the two measures were obtained in Italian and in German.

Figure 3a-b shows the distribution of VOCD and speech rate values in Italian for both groups and in German for bilingual children; means and standard deviations for Italian are also reported in **Table 2** and **Table 3** above. The results show that monolingual children's values for VOCD tend to be higher than bilingual's, especially for older children; within bilinguals, German VOCD is higher than Italian VOCD, with an increase in the German

values across age groups. A similar trend is also found for speech rate: monolingual values are slightly higher than bilinguals', and the latter speak faster in Italian than in German²⁷.

Figure 3. Distribution of VOCD, speech rate and experience scores in Italian (both groups) and German (bilingual children), by group and age group



3.4.2.2 Indirect measures of language dominance: questionnaire-based experience scores

The questionnaire was used to obtain an indirect language experience measure for Italian and German in bilinguals, which were then used to calculate a dominance score. It included questions on the amount of Italian and German experience in the family, during free time, and in educational settings, the number of people the child speaks Italian and German to, length and frequency of periods spent in Italy, and use of Italian and German for reading and multimedia activities. For both languages, I calculated a score comprised of four macro areas, with a maximum of 5 points each: informal quantity, formal quantity, informal quality, and formal quality, each summarized in **Table 4**²⁸.

The four scores were calculated for both languages separately and then added to obtain an Italian experience score and a German experience score, each having a maximum of 20 points. Relative language dominance was then calculated by subtracting the Italian score

²⁷ See section 5.4.3 for a statistical analysis of these trends carried out on the Italian data and on the dominance (experience) measure.

²⁸ The full text of the questionnaire and details of the scoring can be found in the OSF repository of the project, at <https://osf.io/cxg6v/>.

Table 4. Scoring of the linguistic background questionnaire, divided into four areas.

	Formal	Informal
Quantity	<ul style="list-style-type: none"> ▪ Amount of Italian/German experience in formal settings (e.g., school, kindergarten, Italian courses) 	<ul style="list-style-type: none"> ▪ Amount of experience in Italian or German in informal settings (family, friends...) ▪ Long periods spent in Italy
Quality	<ul style="list-style-type: none"> ▪ Type of schooling ▪ Books, audiobooks 	<ul style="list-style-type: none"> ▪ Number of different people involved in interactions ▪ Free time activities (music, TV, videogames)

from the German score. As a result, a positive score indicates that the child is dominant in German, a negative score that they are dominant in Italian. Scores close to zero indicate balanced bilingualism. However, for the purpose of the analysis, dominance was conceptualized not as a category but as a continuum of relative proficiency ranging between “strongly German-dominant” to “strongly Italian-dominant”, thus acknowledging the variability among children. The values for this dominance score based on experience are mostly positive, as indicated by the means and SDs reported in **Table 3** above, indicating that most children had more experience with German than with Italian (see also **Figure 3c**).

3.4.2.3 Irony task

Children additionally completed an Irony comprehension task, adapted from Giustolisi, Panzeri and Bogani (2017). Bilingual children did this task only once; the task was administered in the child’s preferred language as reported by the parents. Children had to interpret a sentence that was uttered within the context of a story. Three stories contained a sentence expressing ironic criticism (target condition), two had a sentence expressing literal criticism and two a literal compliment (control conditions) (see Giustolisi, Panzeri, and Bogani 2017 for further details)²⁹. Children listened to the story while seeing the characters on the screen. At the end of the story, the experimenter asked three questions.

²⁹ Giustolisi, Panzeri and Bogani (2017) also included a fourth condition, ironic compliments. However, we chose to remove it because the length of the task, combined with the other tasks in the same session, was already substantial.

Two were target questions, testing whether the child had correctly interpreted (i) the intended meaning of the utterance, and (ii) the attitude of the speaker. A third question served as an attention check and was not considered in the analysis. Stories and questions are reported in Appendix E. Accuracy in the task was overall very high (95%), indicating that children of all groups were able to understand irony. 6-year-old bilingual children displayed more variability in the task, but still their accuracy was above 87% percent (it was above 92% for the other groups, as shown in Table 2 and Table 3 above).

3.4.3 Perception and Comprehension: materials and procedure

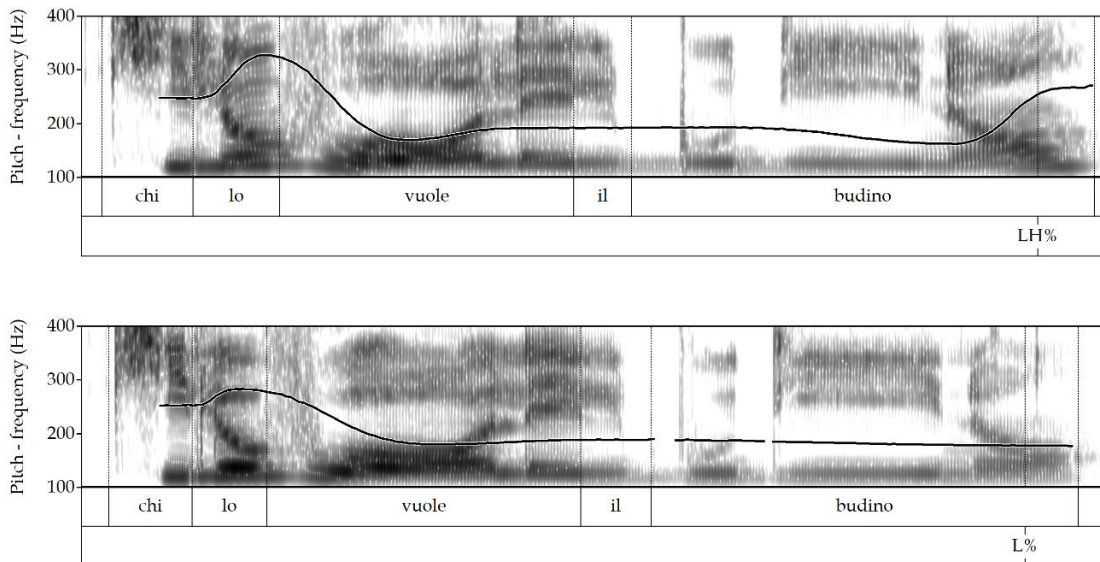
3.4.3.1 Experimental Items

The two experiments used the same kind of experimental items, namely wh-questions of the structure ‘Who eats melon?’. All questions contained the wh-word *chi* ‘who’, which was the subject of the question, followed by one out of four verbs and one out of six nouns (i.e., the direct object). The nouns were all trisyllabic with stress on the penultimate syllable (e.g., *violino* ‘violin’), and they were all part of child vocabulary. The nouns were semantically neutral, as they did not (dis)favor an RhQ interpretation. For a full list of items, see Appendix C. The form of the prosodic and syntactic conditions (Table 5) was chosen after careful consideration and was preliminarily tested in Ferin (2024). The prosodic cues were based on Soriano (2018; 2019) and on independent observation; the preliminary comprehension task reported in Ferin (2024) showed that this type of contour was sufficient to discriminate between ISQs and RhQs by monolingual adults from various regions, both northern and southern. The lexical-syntactic cues were chosen based on the results of the study presented in Chapter 2. The choice of particle for the rhetorical condition was between *ma* and *mai*. While *mai* is stronger than *ma*, the choice fell on the latter because *mai* was found to be much more infrequent. Additionally, native informants of various origin were discordant on its perceived formality.

RhQs had an overall longer duration ($M = 1.6$ s, $SD = 0.1$) and in particular a longer duration of the object noun ($M = 0.8$ s, $SD = 0.1$), a smaller pitch excursion ($M = 7.9$ semitones [st], $SD = .5$), and a low boundary tone (L%). ISQs, on the contrary, had a rising boundary tone (LH%), a greater pitch excursion ($M = 11.5$ st, $SD = 0.9$) and a shorter duration (overall: $M = 1.3$ s, $SD = 0.1$; noun: $M = 0.66$ s, $SD = 0.06$). Figure 4 shows an example for each type of stimuli.

Table 5. Overview of prosodic and syntactic cues used in the Perception and Comprehension task.

	ISQs	RhQs
Prosodic cues	<ul style="list-style-type: none"> • Shorter duration • Greater pitch excursion • Low boundary tone 	<ul style="list-style-type: none"> • Longer duration • Smaller pitch excursion • Rising boundary tone
Syntactic cues	<ul style="list-style-type: none"> • Neutral (no cue) • Ambiguous (RD) 	<ul style="list-style-type: none"> • Neutral (no cue) • Ambiguous (RD) • Rhetorical (<i>ma</i> + RD)

Figure 4. Example of two string-identical stimuli: *Chi lo vuole il budino?/?!* “Who wants pudding?/?!”. The ISQ (above) has a rising boundary tone (LH%), the RhQ (below) has a falling boundary tone (L%). In both examples, the object is right-dislocated.

There were three syntactic conditions. Two of them allowed for both an ISQ and an RhQ reading: in the *neutral* condition, the wh-question was presented without any addition or modification (73a); in the *ambiguous* condition, the object was right-dislocated (73b). The rhetorical condition had a stronger cue to rhetoricity, that is, the combination of *ma* ‘but’ and RD (73c). Neutral and ambiguous sentences were crossed with both prosodic conditions. Rhetorical sentences were only presented with RhQ prosody.

- (73) a. *Chi vuole il budino?* (neutral: no cue)
 who want.3SG the pudding
- b. *Chi lo vuole, il budino?* (ambiguous: RD)
 who CL want.3SG the pudding

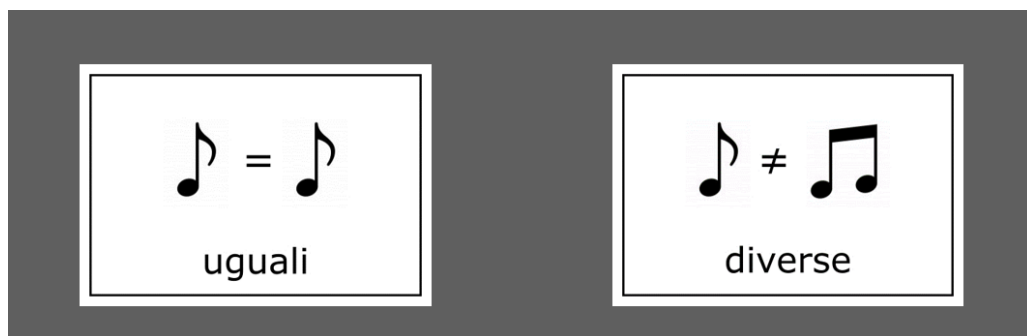
- c. *Ma chi lo vuole, il budino?* (rhetorical: *ma* plus RD)
 but who CL want.3SG the pudding
 ‘Who wants pudding?/?!’

The items were recorded by the author, a female native speaker of Italian, using an Olympus Linear PCM Recorder LS-11 with uncompressed 24 bit/96 kHz recording capability. The files were resynthesized with the software Praat (Boersma and Weenink 2015). Each stimulus was recorded twice. The duration of each pair was averaged, and the files were stylized with a resolution of 2.0 st. The filler items (polar RhQs and ISQs) were created in the same way. The stimuli were correctly identified as RhQs and ISQs by monolingual adult native speakers of Italian in a similar study, proving their effectiveness³⁰.

3.4.3.2 Perception task

The aim of the Perception task was to ensure that children were sensitive to the prosodic cues that were subsequently used in the Comprehension experiment. In this task, children listened to two string-identical sentence pairs, and they had to decide whether they sounded *uguale* ‘same’ or *diverso* ‘different’. They saw two cards containing two musical notes with *uguale* and *diverso* written underneath. The children were presented with the slide depicted in **Figure 5** via screen and audio sharing, while the experimenter used the online platform SoSci Survey (Leiner 2019) to play the sound files and to note down the answers, which the child provided orally.

Figure 5. Screen setup for Perception task.



³⁰ Results for Italian monolingual adults on the same task are shown in Figure C4, Appendix C.

The task consisted of 28 sentence pairs. Twenty pairs belonged to the category *same*, i.e., they were string-identical and had the same prosody. The other eight pairs were *different*, i.e., they were string-identical but differed in their prosodic form. In the category *different*, half of the pairs started with an RhQ followed by an ISQ, the other half had the opposite order. To balance the number of same and different pairs, 12 filler items, each composed of a polar ISQ and a polar RhQ, were included in the category *different*. This resulted in a total of 40 items (see **Table 6**). The two sentences of each pair were concatenated with a 1000 ms silence in between. The order of items was pseudo-randomized, and they were presented without context. The children had to pass a training session (6 practice items) before the actual task, with the goal of training them to pay attention to the prosodic difference rather than the segmental material. They passed it if they recognized at least two sentence pairs of each category correctly. The prosodic contrasts used in the training session included contrasts and syntactic structures not included in the target stimuli (e.g., a *different* pair contrasting a declarative and a polar question intonation)³¹. The training session could be repeated three times; if they did not pass for the third time, the task was terminated, as the child was either insensitive to prosodic contrasts, or failed to grasp the aim of the task. Full instructions are reported in Appendix C.

Table 6. Number of items per condition used in the Perception task.

	Same		Different	
	ISQ-ISQ	RhQ-RhQ	RhQ-ISQ	ISQ-RhQ
Neutral	4	4	2	2
Ambiguous	4	4	2	2
Rhetorical		4		
Filler			6	6
Total	20		20	

³¹ The six practice pairs consisted of a) a *same* pair of declaratives; b) a *different* pair of a declarative and a string-identical polar question; c) a *different* pair of two wh-questions with a clefted wh-constituent, one with ISQ and one with RhQ prosody; d) a *same* pair of polar questions, both with ISQ prosody; e) a *same* pair of clefts with RhQ prosody; f) a *different* pair of ISQs, one with ISQ and one with RhQ prosody.

3.4.3.3 Comprehension task

The Comprehension task was a forced-choice experiment, which was administered after the Perception task. Again, the experimenter noted down the answer in SoSci survey, while the child saw a PowerPoint slide with two cards. This time, the cards consisted of two Disney characters, associated with each question type. Rapunzel was introduced as a curious, friendly character, always asking questions to find out new things (ISQs). Genoveffa ‘Drizella’, Cinderella’s stepsister, was characterized as always being grumpy and unfriendly, replying to Cinderella’s suggestions with unfriendly remarks (RhQs), such as “Who eats bananas?!”. In the character descriptions, an example was used to illustrate the question type. The RhQ remark was explicitly associated with a negative answer and the obviousness of such answer (e.g., “Who eats bananas?!” = “No one eats bananas!”). The children were already familiar with the characters, their attitude and the type of question associated with them from a previous task (Production task, see Chapter 4 and Chapter 5). The full instructions can be found in Appendix C.

The Comprehension task consisted of a total of 30 experimental items, plus 14 filler items (Table 7). The number of fillers was used to balance out the different number of ISQ and RhQ test items. The questions were presented in a pseudo-randomized order without context.

Table 7. Number of items per condition used in the Comprehension task.

	ISQ	RhQ
Neutral	6	6
Ambiguous	6	6
Rhetorical		6
Filler	10	4
total	22	22

3.4.4 Statistical analysis

For the statistical analyses, I fitted mixed-effects regression models in R (R Core Team 2023), using the packages *lme4* (Bates et al. 2015) and *lmerTest* (Kuznetsova, Brockhoff, and Christensen 2017). Post-hoc pairwise comparisons with Tukey correction of *p*-values were obtain with the package *emmeans* (Lenth 2023). I followed a stepwise model selection procedure based on the Akaike Information Criterion (AIC), removing non-significant

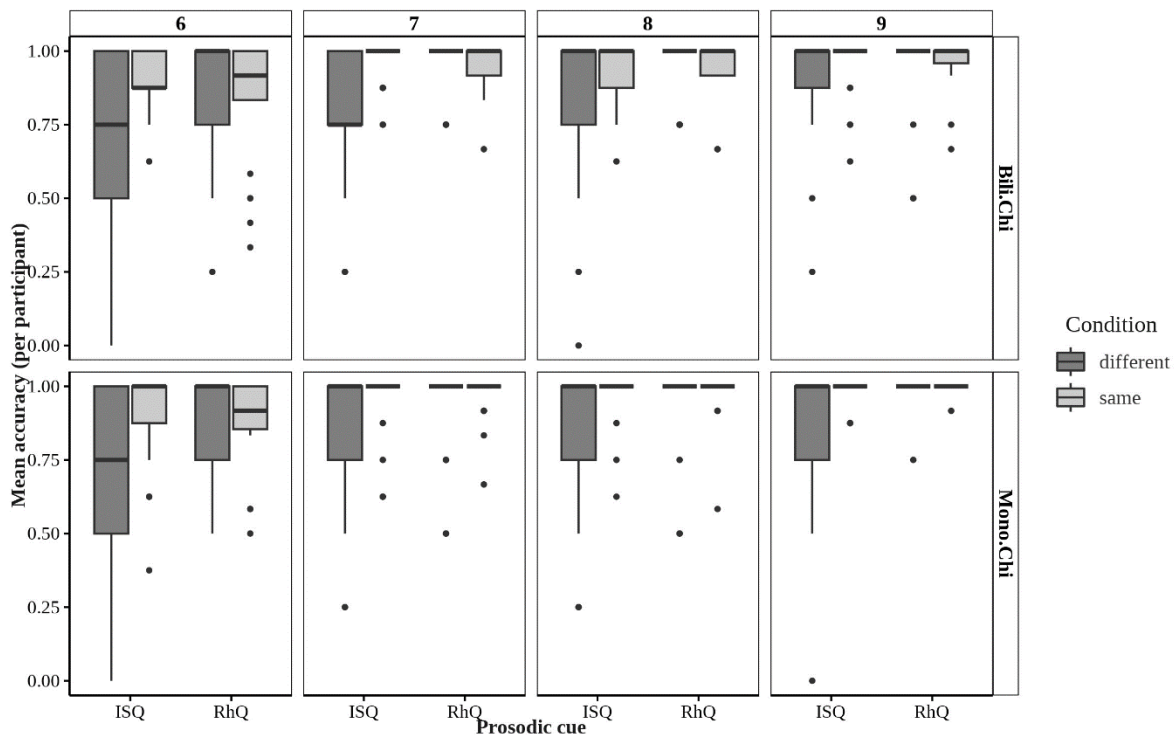
interactions and main effects. For the Perception and Comprehension task, I fitted logistic mixed-effects regression models with Accuracy (i.e., correctly identified pair/correctly identified question type) as a categorical binary dependent variable (DV) (1 = correct, 0 = incorrect). Categorical independent variables (IVs) were coded as factors and received treatment coding. Continuous IVs were scaled to improve model fit. Participant and Item were added as random effects; random slopes were included whenever possible. For an overview of all models and a complete report of their effects, see Appendix F.1 and F.2.

3.5 Results

3.5.1 Perception task

The results of the Perception task are shown in **Figure 6**, representing the mean accuracy for each participant, divided by condition, group and age group. One bilingual and two bilingual 6-year-old children did not pass the training session of the Perception task and were removed from all following analyses.

Figure 6. Mean accuracy in the Perception task per condition (different vs. same) by age group and group. Each data point represents mean accuracy for one participant.



Overall, accuracy in this task was very high for both groups (bilinguals: 91%, $SD = 11$; monolinguals: 92%, $SD = 10$). Accuracy improved with age, with the 6-year-olds having the lowest accuracy (85% bilinguals, 86% monolinguals) and the 9-year-olds the highest accuracy (95% bilinguals, 97% monolinguals). The 7- and 8-year-olds fall in-between (7: 93% bilinguals, 93% monolinguals; 8: 92% bilinguals, 95% monolinguals).

For the statistical analysis, I fitted two separate models for monolingual and bilingual children, adding Age group ('6' vs '7' vs '8' vs '9') and Condition ('same' vs 'different') as IVs, as well as an interaction between the two. In the bilingual model, additional IVs were Dominance (calculated from language experience; continuous) and AoO ('2L1' vs 'eL2'). Condition was added as random slope to Participant.

In both models, the interaction was not significant and was thus removed. Dominance and AoO were also removed from the bilingual model. Thus, both models returned the same significant effects, i.e., a significant main effect of Age group (bilinguals: $\chi^2(3) = 10.89$, $p = .012$, monolinguals: $\chi^2(3) = 17.18$, $p < .001$) and of Condition (bilinguals: $\chi^2(1) = 6.13$, $p = .013$, monolinguals: $\chi^2(1) = 22.54$, $p < .001$).

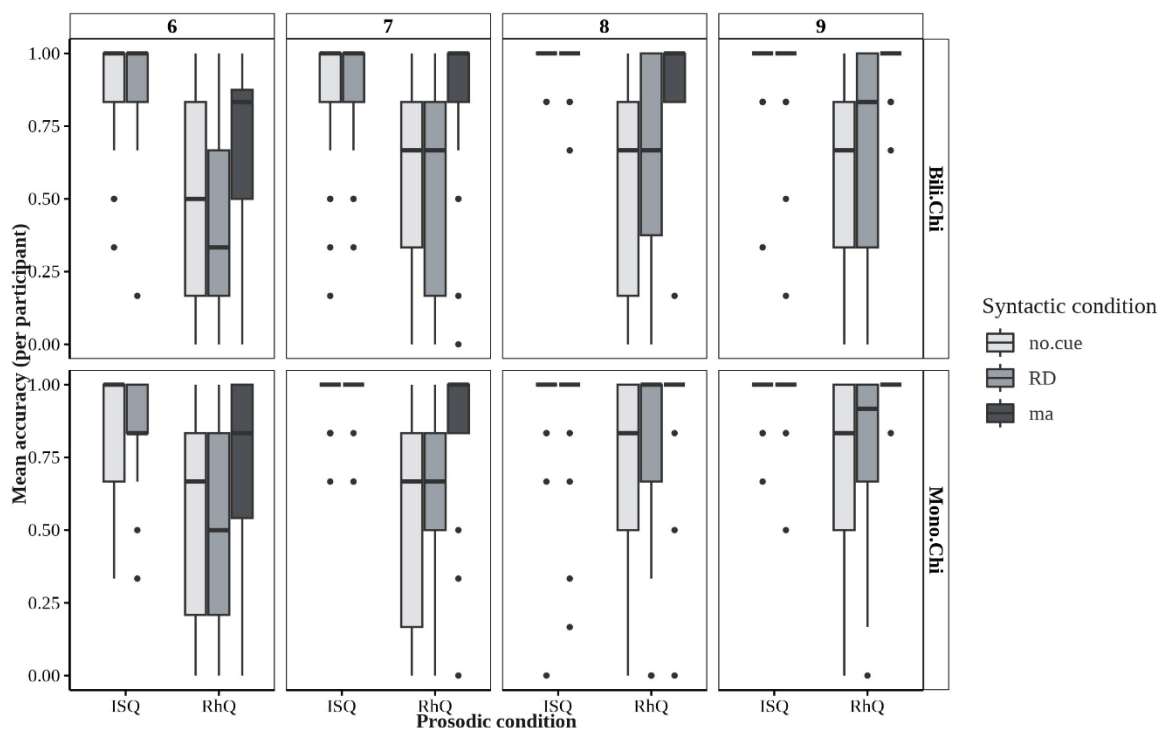
For the effect of Age group, the post-hoc comparison revealed that the effect was driven by the relatively lower scores of 6-year-olds. In the bilingual group, 6-year-olds were significantly less accurate than 9-year-olds ($\beta = -1.48$, $SE = 0.47$, $z = -3.12$, $p = .01$). In monolingual children, they were significantly different from 8-year-olds ($\beta = -1.55$, $SE = 0.5$, $z = -3.07$, $p = .011$) and 9-year-olds ($\beta = -2.13$, $SE = 0.57$, $z = -3.76$, $p = .001$). All other comparisons were not significant.

For the effect of Condition, children were significantly better at identifying same-pairs than different-pairs (bilingual: $\beta = -0.84$, $SE = 0.34$, $z = 0.48$, $p = .013$; monolinguals: $\beta = -1.89$, $SE = 0.4$, $z = -4.75$, $p < .001$), which may indicate a slight bias towards the positive answer. Nevertheless, the majority of the children was still above chance level (50%) in the identification of different pairs. Only sixteen children were at or below chance (ten 6-year-olds, two 7-year-olds, two 8-year-olds, two 9-year-olds). One of these children (6-year-old) also scored low in condition *same*. This child is excluded from the analysis of the Comprehension task. To account for the variability found for the other children, and since the ability to discriminate string-identical sentence pairs through prosody is also considered crucial for the performance in the Comprehension task, I included the children's performance in the category *different* as a fixed effect in the following analyses ('Perception score').

3.5.2 Comprehension task

The results of the Comprehension task are summarized in **Figure 7**, showing the response accuracies for each participant, divided by group, age group, prosodic cue, and syntactic cue. Both groups presented a higher mean accuracy for ISQs than for RhQs, and a greater individual variation for the latter (bilingual: $M = 91\%$, $SD = 17$ vs. $M = 66\%$, $SD = 28$; monolingual: $M = 92\%$, $SD = 16$ vs. $M = 72\%$, $SD = 29$). Within ISQs, the two syntactic conditions (neutral and ambiguous) appear to have the same distribution. Within RhQs, sentences in the rhetorical condition (*ma* and RD) have the highest accuracy in all groups. However, there is a difference between age groups: while 6-year-olds display a large variance, with the bars and whiskers going from 0 to 1 (i.e., some children were 0% accurate, some were 100% accurate, others were somewhere in between), accuracy in this condition improves almost to ceiling in the older age groups. For the neutral and the ambiguous cue, the improvement is smaller (and visible mostly in monolingual children), and individual variation remains very high.

Figure 7. Mean accuracy in the Comprehension task per syntactic and prosodic condition, by age group and group. Each data point represents mean accuracy for one participant.



3.5.2.1 Two-level comparison: the effect of prosody

The inferential analysis was conducted in two separate steps. In a first set of models (*two-level comparison*), I analysed the fully crossed design, i.e., only neutral and ambiguous cue (IV: Syntactic cue, 2 levels) crossed with ISQ and RhQ prosody (IV: Prosodic cue, 2 levels). Two separate models were fitted for bilingual and monolingual children. The maximal models included a three-way interaction between Age group, Syntactic cue, and Prosodic cue. Several additional IVs were added as predictors: the Perception score (continuous, scaled), the Irony score (continuous, scaled), Italian VOCD (continuous, scaled) and Italian speech rate (continuous, scaled); the bilingual model additionally included Dominance (continuous, scaled) and AoO (categorical, '2L1' vs 'eL2'). Prosodic cue was added as random slope to Participant.

The model selection yielded two different final model structures for bilinguals and monolinguals. The bilingual model retained the three-way interaction ($\chi^2(3) = 8.57$, $p = .036$), as well as a main effect of Prosodic cue ($\chi^2(1) = 12.63$, $p < .001$). All children were more accurate in ISQs than in RhQs ($\beta = 3.5$, $SE = 0.52$, $z = 6.74$, $p < .001$). However, the effect of syntactic cue was different across Prosodic cue and Age group: the effect was present only within RhQs; accuracy improved with age only in the ambiguous condition (i.e., when RD was present), and not within the neutral condition. The ambiguous condition is significantly higher than the neutral one only within 9-year-olds ($\beta = -0.81$, $SE = 0.36$, $z = -2.23$, $p = .025$). Additionally, there was a significant positive effect of the Perception score ($\beta = 0.45$, $SE = 0.16$, $z = 2.81$, $p = .005$), indicating that a higher accuracy in the different pairs in the Perception score correlated with a higher accuracy in the Comprehension task. Finally, there was a significant effect of Dominance, with children with a higher German dominance having a lower accuracy in the Comprehension task ($\beta = -0.5$, $SE = 0.18$, $z = -2.81$, $p = 0.005$).

The final structure of the monolingual model was much simpler: the model retained only a main effect of Prosodic cues ($\chi^2(1) = 25.28$, $p < .001$), with ISQs being more accurate than RhQs ($\beta = 3.03$, $SE = 0.6$, $z = 5.03$, $p < .001$), and a positive main effect of the Perception score ($\beta = 1.16$, $SE = 0.21$, $z = 5.54$, $p < .001$).

3.5.2.2 Three-level comparison: the effect of lexical-syntactic cues

A second set of models (*three-level comparison*) compared the accuracy of all three syntactic levels in the RhQ condition, excluding the ISQ condition. Again, two separate models were

fitted for the two groups. The maximal model included an interaction term between Syntactic cue (3 levels: 'neutral' vs 'ambiguous' vs 'rhetorical') and Age group (4 levels: '6' vs '7' vs '8' vs '9'). Additional IVs included the Perception score, the Irony score, Italian VOCD and Italian speech rate, plus Dominance and AoO for bilingual children.

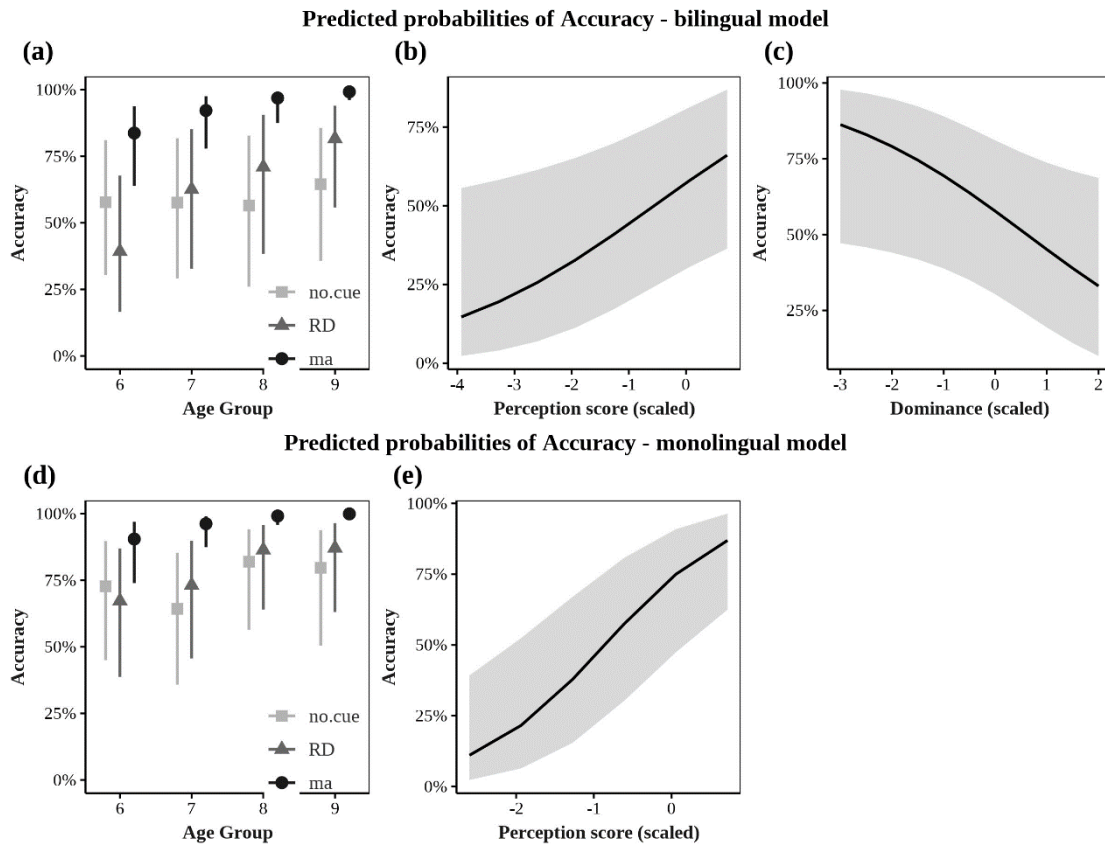
After model selection, both models presented a significant interaction between Syntactic cue and Age group (bilingual: $\chi^2(6) = 17.98, p = .006$; monolingual: $\chi^2(6) = 18.37, p = .005$), and Syntactic cue was also significant as a main effect (bilingual: $\chi^2(2) = 21.12, p < .001$, monolingual: $\chi^2(2) = 21.58, p < .001$). As a main effect, there was no difference between the neutral and ambiguous conditions; at the level of the interaction, the exception was the same small effect also found in the two-level comparison for bilinguals: only 9-year-olds were marginally better when RD was present ($\beta = -0.89, SE = 0.39, z = -2.28, p = .059$).

Conversely, the presence of *ma* (rhetorical cue) significantly improved accuracy compared with the other conditions, both for bilingual (neutral vs rhetorical: $\beta = -2.72, SE = 0.38, z = -7.23, p < .001$; ambiguous vs rhetorical: $\beta = -2.47, SE = 0.36, z = -6.8, p < .001$) and for monolingual children (neutral vs rhetorical: $\beta = -3.22, SE = 0.39, z = -8.16, p < .001$; ambiguous vs rhetorical: $\beta = -2.96, SE = 0.39, z = -7.57, p < .001$), and this was true for all comparisons within age groups. Still, an age improvement was observed within the rhetorical condition: in both groups, 9-year-olds were significantly more accurate than 6-year-olds (bilingual: $\beta = -3.17, SE = 0.87, z = -3.65, p = .002$; monolingual: $\beta = -4.85, SE = 1.48, z = -3.28, p = .006$) and 7-year-olds (bilingual: $\beta = -2.34, SE = 0.9, z = -2.64, p = .04$; monolingual: $\beta = -3.87, SE = 1.5, z = -2.58, p = .049$). The interaction is visually represented in **Figure 8a,d**.

The effect of the Perception score was positive and significant for both groups (bilingual: $\beta = 0.52, SE = 0.23, z = 2.26, p = .023$; monolingual: $\beta = 1.2, SE = 0.31, z = 3.92, p < .001$). For bilingual children, there was also a positive effect of Dominance ($\beta = -0.51, SE = 0.26, z = -1.96, p = .049$).

As to the other additional factors, I did not find an effect of irony comprehension, VOCD, speech rate nor AoO in any of the models; thus, these predictors were removed from the models during model selection.

Figure 8. Model estimates of accuracy in the three-level comparisons, predicted by the Syntactic cue * Age group interaction (a,d), Perception score (b,e) and Dominance (c)

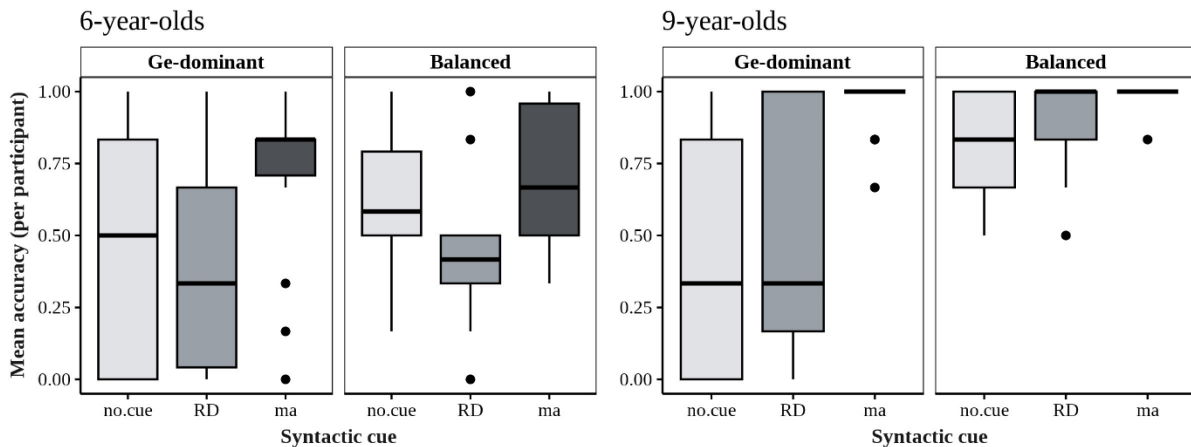


3.5.2.3 More on the effect of dominance

To further explore the role of dominance in the process of acquisition, I divided 6- and 9-year-olds in two groups, with median Dominance as the cut-off point between the groups. Since most scores are above 0, the higher-dominance group represents the children who have the strongest imbalance in favour of German experience, while the lower-dominance group is either closer to 0 (i.e., to a balanced experience) or more exposed to Italian than German. For convenience, I will refer to the two groups as Balanced (lower scores) and German-dominant (higher scores). **Figure 9** shows that, while there is no difference between the two dominance groups for 6-year-olds, balanced 9-year-olds have a higher accuracy than their German-dominant peers in the neutral (80% vs. 39%) and ambiguous conditions (88% vs. 49%). I tested the interaction between Age group, Dominance group, and Prosodic cue. While the three-way interaction was overall not significant ($\chi^2(2) = 0.5$, $p = .78$), the post-hoc comparison reveals that there is a negative difference between German-dominant and balanced 9-year-olds in the neutral ($\beta = -2.77$, $SE = 1.03$, $z = -$

2.69, $p = .007$) and ambiguous conditions ($\beta = -2.8$, $SE = 1.06$, $z = -2.64$, $p = .008$), while this does not hold for 6-year-olds (Ge-dominant – balanced | neutral: $\beta = -1.05$, $SE = 0.95$, $z = -1.11$, $p = .267$; ambiguous: $\beta = -0.62$, $SE = 0.95$, $z = -0.65$, $p = .513$).

Figure 9. Results in the RhQ condition for German-dominant and Balanced 6- and 9-year-olds.



3.6 Discussion

This study examined the comprehension of RhQs in Italian by bilingual and monolingual children of four different age groups (6-, 7-, 8-, and 9-year-olds). In the following, I summarize the findings and discuss the influence of linguistic and extra-linguistic factors.

3.6.1 Understanding rhetorical questions

RQ1 was concerned with whether monolingual and bilingual children of different age groups are able to interpret questions as rhetorical. For bilingual children, the question is whether they can do so in their HL. The results of the Comprehension task indicate that most children of both groups were able to successfully differentiate ISQs from RhQs. This claim needs to be refined and justified against the high overall variability in the results. The first consideration is that children were not simply replying at chance: the vast majority of children were above chance (mostly at ceiling) in the ISQ condition, indicating that they were able to recognise a question as information-seeking when it had the appropriate form and to correctly map it to the character associated with this question function. The high variability among children was found only within RhQs, and only within certain conditions. If children were replying at chance, the same pattern would have been found across all conditions.

Secondly, the high variability in the RhQ prosody condition indicates that children behaved differently within the same age group. In all groups, certain children scored at or close to 0% in certain conditions, indicating that they were listening to RhQs but consistently interpreting them as ISQs. Other children scored at or around 50% - these children were indeed replying at chance level, but only within those conditions. Other children scored close to or at 100%, showing that they could listen to a question with a certain form and map it to the correct character. Importantly, in the *rhetorical* condition, in which the question contained *ma* and RD in addition to rhetorical prosody, virtually all children from age 7 were close to ceiling, with the exception of a few outliers. I return to the role of specific cues below, but the fundamental observation here is that in the appropriate situation almost all children were able to assign different functions to the same type of interrogative utterances.

This result is fundamental in showing that from age 7, and mostly also at 6, children have knowledge of the fact that questions can have different functions depending on their context, and that interrogatives may not be used simply for asking for information; when they fail to recognise a question as non-canonical, the failure is due to the linguistic form of the question itself. Thus, so far, we have been able to establish that children are able to assign different functions or interpretations to questions. The question still remains whether children actually interpret questions as rhetorical. I return to this issue below.

One last important consideration is that bilingual and monolingual children's results were remarkably similar. Although the direct comparison between the two groups was not tested statistically, the distribution of results across conditions and the type of variance (as shown in **Figure 7**), was very similar in both groups. There were some minor differences in the effect of RD in the rhetorical condition, as well as an effect of Dominance in bilinguals (discussed below), but for the most part, bilingual children were able to differentiate between question types equally well as monolingual children. In other words, no relevant advantage or disadvantage was found due to the children's bilingualism.

With RQ2 and RQ3, I addressed the effects of linguistic (prosodic and syntactic cues), extra-linguistic factors (dominance, age) and irony comprehension on RhQ comprehension. An important prerequisite for discussing the potential effect of prosody are the results of the Perception task, which was used to ensure that children were sensitive to the prosodic cues. The high accuracy for all age groups in the Perception task indicates an overall adequate ability to discriminate the two prosodic forms used in the Comprehension task.

However, some children, 6-year-olds in particular, had some difficulties in the Perception task, which in turn may have influenced their performance in the Comprehension task.

3.6.2 Language-specific cues in Italian

When comparing RhQ and ISQ prosody (two-level comparison), results show that a lower accuracy in the Perception task was indeed associated with a lower accuracy in the Comprehension task. Children who could not perceive the difference in the Perception task had difficulties in interpreting their meaning in the Comprehension task.

Considering the effects of the prosodic cue in greater detail, I found a high accuracy for ISQs, above 75%. This is not unexpected, since ISQs represent the canonical use of questions, are very frequent in everyday speech, and are acquired very early by children (see, e.g., Lleó and Rakow 2011 for monolingual and bilingual children; Wode 1971 for early use of intonation to mark questions). Conversely, all groups displayed the aforementioned 0-100% variability when the sentence was accompanied by RhQ prosody. This asymmetry may indicate a bias towards a literal interpretation of the sentence, which allows the child to map the sentence to its canonical function, without necessarily taking into account its prosodic form. A prosodic bias in bilingual children (Champoux-Larsson and Dylman 2019) was not found.

Thus, it seems that prosody was not sufficient to disambiguate string-identical RhQs and ISQs for all children, but that the interplay between prosody and syntax affects interpretation and the acquisition process³². The results of the second analysis (3-level comparison) revealed that across all age groups, the rhetorical condition was significantly better than the neutral and the ambiguous condition, with an improvement with age. Since the ambiguous and the rhetorical cue both had RD, but only the rhetorical cue substantially improved accuracy³³, the improvement is attributable to the presence of the sentence initial particle *ma* ‘but’, which is combined with the rhetorical prosody.

³² Note that adults, both monolingually-raised Italian speakers and HSs of Italian with German as their ML, had categorical judgements on the same stimuli: for adults, accuracy was at ceiling or almost at ceiling in all conditions, including those that rely only on prosody. Thus, the hypothesis that the ambiguity lies on the prosodic form of the stimuli themselves can be ruled out. This result is shown in Figure C4, Appendix C.

³³ The effect of RD in bilingual children was significant, but it was small, and the 0-100 variability was present in all conditions.

Ma is found not only in RhQs, but also in other types of non-canonical questions (Giorgi and Dal Farra 2019; Hinterhölzl and Munaro 2021; Ippolito 2021): counter-expectational questions (e.g., *Ma non eri allergico ai gatti?* '(But) weren't you allergic to cats?'), surprise-disapproval questions (e.g., *Ma cosa leggi?!* '(But) what are you reading?!') (Giorgi and Dal Farra 2019), or Cfv-questions (e.g., *Ma dove diavolo avrò messo le chiavi?!*) (Hinterhölzl and Munaro 2021). Like RhQs, these have a special pragmatic function and at the same time express the speaker's attitude towards the answer. In the case of biased and surprise questions, Giorgi and Dal Farra (2019) analyse *ma* as a discourse head anaphoric to the context of utterance, and situate it in the scope of an empty evaluative head, on which the speaker's attitude is encoded, signalled by a marked prosodic form. Thus, *ma* is not a cue that signals rhetoricity, but it signals a contrast with the speaker's expectations. This, in turn, can give a clue to the speaker's intended meaning, e.g., that the speaker believes that no one wants pudding (see **Figure 4**), and thus signals that possibility of someone eating pudding, mentioned in the question, contrasts with their expectation. In other words, the counter-expectational value of *ma* provides only a partial indication of the fact that the speaker intends the question as rhetorical.

It is worth repeating that, although the presence of *ma* sharply improves children's ability to recognise RhQs, this condition is in fact a combination of the particle and of rhetorical prosody. The latter is composed of paralinguistic cues expressing attitude or emotion (duration, pitch excursion) and by the shape of the intonational contour. The makeup of the experiment does not allow to tease apart the role of each single component, hence, it is unclear whether children are paying attention to the evaluative or the discourse aspect of the sentence, or both. All elements are compatible with the context with which RhQs were associated: the character used, e.g., *Who eats bananas?!* to reply to someone who asked them if they wanted to eat bananas; the reaction also contained an emotive component, in that the character expressed disapproval. Thus, it is possible that a child recognised only one of such elements (e.g., the emotive attitude) and that it was sufficient to map the question onto the single character. For this reason, it is not possible to determine beyond doubt that children have fully acquired RhQs as a functional category, or if they are interpreting the question as a neighbouring category (e.g., a Cfv or a surprise-disapproval question).

However, it is evident that for children *ma* is a strong cue to the question being, if not outright rhetorical, at least non-canonical. I offer three possible reasons for the salience of

ma, which may complement each other: First, *ma* overtly lexicalises the non-canonical status of the sentence, along the lines outlined above, disavouring a literal interpretation. Second, *ma*, as a marker for non-canonical questions and exclamations, is likely to be highly present in child-directed speech associated with criticism and negative attitude, in sentences such as *Ma che hai fatto?* '(But) what have you done?!'. This hypothesis should be confirmed by a corpus study on child-directed speech in Italian. Third, *ma* is sentence-initial and salient for the child, making it easier for the child to detect and interpret.

RD was not as effective. Although RD is frequent in RhQs, it is also compatible with a canonical reading of the question and is thus ambiguous. Thus, in a sentence with RD, the crucial disambiguator is prosody, like in neutral questions. This was reflected in the results for the neutral and ambiguous condition: RD only showed an effect for RhQs in bilingual children, in that it slightly improved RhQ identification in older children. However, the presence of RD did not affect the comprehension of ISQs: when the prosody was information-seeking, children identified the question correctly, with or without RD.

3.6.3 Additional factors

With respect to the role of extra-linguistic factors (RQ3), we see an improvement over age: 9-year-olds were better at recognizing RhQs than 6- and 7-year-olds, but only in the rhetorical condition. As discussed above, this condition has high scores for almost all children above age 6, which indicates that most children have acquired the concept that a question can be used non-canonically, as well as the ability to recognize non-canonical questions when provided with a combination of prosodic and lexical cues. The ability to recognize the prosodic form alone was acquired by some children but not others across the investigated age span. These findings are in line with Friend (2000) and Morton and Trehub (2001) for monolingual children, showing that the ability to weigh paralinguistic/intonational over lexical cues is developing in the age range investigated.

Given the similarities between RhQs and ironic language, I also investigated whether irony comprehension operationalized through the Irony task affects RhQ comprehension. However, this measure did not show an effect. As children of all age groups scored at or close to ceiling in the Irony task, it is possible that this specific measure for irony was not sensitive enough for the investigated age group. Nevertheless, the high accuracy in the Irony task suggests that all children acquired the concept of irony but, as the results of the Comprehension task show, they are still acquiring the relevant cues to rhetoricity. This

difference is likely due to the different nature of the two tasks: the Irony task consisted of naturalistic stories ending in a literal or ironic remark, investigating whether children were able to interpret a non-literal meaning in the appropriate context. Conversely, the RhQs in the Comprehension task were presented without context, and the task addressed children's ability to recognize the linguistic cues of the question and map them onto the question function.

Finally, bilingual children in the sample were not perfectly balanced in their two languages, which I accounted for by calculating their language proficiency and their relative experience with the ML (language dominance). Direct measures of language proficiency had no effect on either monolingual or bilingual children's comprehension. On the contrary, dominance significantly predicted bilingual children's performance in the task: children who were balanced or Italian dominant were better at discriminating ISQs and RhQs based on their prosody (two-level comparison) and at identifying RhQs more in general (three-level comparison).

To further investigate the interaction between age and dominance, I split 6- and 9-year-olds into (more) balanced and (more) German-dominant. While I found no difference for the 6-year-olds, balanced 9-year-olds were significantly better than German-dominant ones. In other words, only Italian-dominant 9-year-olds seem to rely consistently on prosodic cues as well as syntactic cues to RhQs, as shown by their high accuracy in all conditions, not only in the rhetorical one. This result supports the claim that exposing children to their HL more plays a crucial role in the acquisition of complex linguistic phenomena that are acquired later in childhood.

3.7 Conclusion

The aim of this set of experiments was to investigate if bilingual children of different ages are able to understand RhQs in Italian when presented without a context, and if so, which linguistic and extra-linguistic factors affect comprehension. I found that the ability to understand RhQs based on their linguistic form is still developing in primary school children and that the highest accuracy, across all groups, was triggered by the presence of *ma* and RhQ prosody, suggesting an interplay between prosody and syntax. Furthermore, results show an effect of dominance based on language exposure. Children with a relative higher experience with Italian were better at identifying RhQs and showed the most noticeable improvement over age.

This study shows that both monolingual and bilingual children are able to interpret a question as rhetorical or non-canonical based on its linguistic cues. The issue remains open whether children are able to use such cues in production. I address this question in Chapter 4 (monolingual children) and Chapter 5 (bilingual children).

Chapter 4. THE MONOLINGUAL ACQUISITION OF LEXICAL AND SYNTACTIC CUES IN RHETORICAL QUESTIONS

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4.1 Introduction

In her seminal paper on timing in (bilingual) first language acquisition, Tsimpli (2014) distinguishes between early, late and very late acquired phenomena. Early acquired phenomena are core and involve narrow syntax, while late and very late acquired phenomena involve syntax-external or language-external resources. Very-late-acquired phenomena typically reach adult-like behaviour only in late childhood or even early adolescence. Examples include aspects of pronominal use, discourse connectors and ambiguity resolution, i.e., semantically and pragmatically complex properties which are more demanding than narrow syntactic properties. Late acquired phenomena can be extremely multidimensional in requiring the coordination of phonetic, morphosyntactic, semantic, pragmatic, and language-external cues. Not only are they demanding for the learner, but they also pose challenges to the researcher. From a conceptual point of view, it may not be obvious when a complex construct, where each ingredient comes with its own acquisition timing, is acquired.

RhQs are a case in point. They have many ingredients, phonological, morpho-syntactic, lexical, pragmatic, and extra-linguistic, each with their own acquisition trajectories, making them a complex phenomenon with grammar internal and external interfaces. Pragmatically, RhQs constitute an indirect speech act. The canonical function of an interrogative utterance is a request for information from an ignorant speaker to a competent addressee (Farkas 2022); while RhQs are syntactically and semantically questions (Caponigro and Sprouse 2007), they are communicatively more similar to assertions, as the speaker presents the answer as obvious and is committed to it (Biezma and Rawlins 2017).

Although RhQs are eminently a pragmatic phenomenon, their special interpretation may be signalled by some additional marking in the question itself, including prosodic cues (Dehé et al. 2022), discourse particles (Dehé, Wochner, and Einfeldt 2022) and other lexical-syntactic cues. As outlined in section 2, such markers are not obligatory, and they are not markers of “rhetoricity” as a grammatical category. Rather, they contribute an additional pragmatic interpretation, that, when combined with the question and/or with the context of utterance, favours a rhetorical interpretation of the sentence. This poses a further methodological challenge, because, if markers are optional, we cannot define “acquisition” in terms of constructing grammatical vs ungrammatical sentences, nor in terms of a certain percentage of use in obligatory contexts, as commonly done for other

phenomena. Therefore, I will explore the children's productions of additional pragmatic marking by comparing them to adult productions, inspecting frequencies at the group level. Although each single marker is optional, the patterns of use at the group level should indicate whether children's productions follow the same patterns of modification as adults.

This study focuses on the acquisition of lexical-syntactic markers of RhQs in elicited production, in comparison with ISQs. I investigate which lexical and syntactic cues primary school children use when producing RhQs (RQ1), how they differ from adults (RQ2) and when their use becomes adult-like (RQ3). The chapter is structured as follows. In section 4.2, I resume the essential points on RhQ marking in Italian, discussed in Chapter 2. Sections 4.3 and 4.4 report the method and the results of the elicited production study. In sections 4.5 and 4.6 I discuss the results and outline a conclusion.

4.2 Cues to rhetorical questions in Italian

The patterns of modification for RhQs in Italian have already been explored in depth in Chapter 2. In this section, I repeat the elements that are relevant for the present chapter. Although a number of papers have explored the strategies for marking RhQs in Italian by means of lexical and syntactic cues (e.g., Fava 1994; 1995; Hinterhölzl and Munaro 2021; Obenauer and Poletto 2000; Stati 1982), these have been exclusively qualitative in nature, so that it is unclear how often the identified cues appear in naturalistic speech. The study reported in Chapter 2 carried out the first quantitative study to elicit and analyse cues to RhQs in Italian, focusing on colloquial language (see also Ferin 2024). In this study, which elicited negative-answer RhQs with a negative emotive attitude, eight different cues were used repeatedly, though with different frequencies: The particles *ma*, *e*, *mai*, conditional verb morphology, *wh-the-hell*-like expressions, interjections, embedding under the verb *volere* 'want', RD and cleft sentences. Some questions were modified by more than one cue.

By far the most frequent cue was the particle *ma* 'but' (74). In its canonical use, *ma* has an adversative function. As a discourse particle at the beginning of a question, it takes a counter-expectational value, by which the speaker signals some contrast between the proposition and their previous expectations or knowledge (Giorgi 2018). *Ma* occurs in various types of non-canonical questions in Italian, including counter-expectational, surprise-disapproval, Cfv-questions and RhQs (Giorgi and Dal Farra 2019; Hinterhölzl and Munaro 2021; Ippolito 2021). In Section 2.3.4.1, I proposed that *ma* is compatible with RhQs that are uttered in a situation of contextual conflict or to challenge the interlocutor.

Similarly, although less frequently, the particle *e* ‘and’ is used (74). *E* has an additive meaning, i.e., it is used to add an alternative to one that has already been mentioned. It may give rise to an effect of opposition, but this is a secondary effect, arising from the necessity of the conjoined elements to be different from each other (Umbach 2005). Overall, *ma* and *e*, as discourse particles, link the question to the context of utterance. While *e* has an additive meaning and can give rise secondarily to an effect of opposition, *ma* is a direct marker of counter-expectations.

- (74) **Ma/E** *chi è che mangia il lime?!*
but/and who is that eats the lime
‘(But/And) who eats lime?!’

Another frequent cue is conditional morphology. However, the presence of a conditional alone does not make the question rhetorical. Conditional morphology is compatible with an ISQ, to which it can give a nuance of politeness or offering. It usually gives rise to the rhetorical interpretation in combination with other cues, such as *ma* in (74) or *mai* in (75) below. The conditional provides a modal base to expand the set of situations in which a positive answer to the question is impossible, unlikely, or even against the speaker’s expectations (Dikken and Giannakidou 2002). In a similar account, the conditional mood in Italian introduces *irrealis* modality (Obenauer and Poletto 2000), by which the proposition becomes non-assertive. Put simply, by saying *Who eats lime!?* the speaker presents the event of eating lime as a factual event, while with *Who would eat lime?* the event is presented as hypothetical; the addressee does not know whether it is happening or has happened. In the context of negative-answer RhQs, the event denoted by the proposition is not factual.

- (75) **Ma** *chi mangerebbe un lime?!*
but who eat.COND.3SG a lime
‘Who would eat a lime?’

The particle *mai* ‘ever/never’ was as frequent as conditionals. *Mai* can occur in two syntactic positions: immediately after the wh-word, with the verb either in indicative or conditional morphology (76), or (usually) after the inflected verb (‘adverbial position’) (Coniglio 2008; Hinterhölzl and Munaro 2021; Obenauer and Poletto 2000). In the latter case, the verb is

always conditional (77). The syntactic position of *mai* seems to influence also its interpretation (see Ferin 2024; Obenauer and Poletto 2000; Chapter 2 for suggestions). As to the interpretation that *mai* contributes to RhQs, there are two possibilities: a) *mai* retains its temporal meaning and the non-canonical interpretation arises through its combination with other semantic and/or contextual elements (Manzini 2015), or b) *mai* shifts from being an adverb to being a discourse particle (Coniglio 2008). I propose that a) is the case when *mai* is in adverbial position (77), while b) is true when *mai* is adjacent to the wh-word (76).

(76) *Chi mai impara / imparerebbe poesie?!*
who ever learn.IND.3SG / COND.3SG poems
'Who would ever learn poetry (by heart)?!'

(77) *Ma chi andrebbe mai al museo?!*
but who go. COND.3SG ever to.the museum
'Who would ever go to the museum?'

Another marker of RhQs are aggressive expressions, which immediately follow the wh-expression, modifying it. The use of such so-called 'aggressively non-D-linked' expressions has been extensively analysed for English *wh-the-hell* (Celle, Jugnet, and Lansari 2021; Dikken and Giannakidou 2002), which can express surprise or disapproval, or be rhetorical. Semantically, aggressive markers contribute a negative attitude or emphatic intensification of the speaker's attitude towards the propositional content of the question (Beltrama and Trotzke 2019; Celle, Jugnet, and Lansari 2021).

RhQs can also be embedded under the verb *volere* 'want', as illustrated in (78), with the wh-word being extracted from the embedded clause. The verb *volere* loses its lexical meaning and becomes a fixed expression indicating that the embedded question is rhetorical (see also Obenauer 2004).

(78) *Chi vuoi che beva la tisana?!*
who want.2SG that drink.SBJV the herbal_tea
'Who (do you think) drinks herbal tea?!'

Two other cues that appear in RhQs are cleft questions and RD. Both are information structure devices, the former marking a contrastive focus and the latter a familiar topic (Benincà, Salvi, and Frison 1995), and both are compatible with ISQ readings. In cleft

questions, the clefted element is the wh-phrase *chi* ‘who’ (79). Cleft constructions are commonly associated with a contrastive/corrective focus and are presuppositional in nature. However, in some varieties, clefts are obligatory to form subject questions, and lose their presuppositionality (see Poletto and Vanelli 1995 for Venetan); this complicates an analysis of their potential connection with RhQs.

- (79) *E chi è che legge romanzi?*
and who is that reads novels
‘Who reads novels?!’

With RD, a phrase is dislocated to the right edge of the sentence and, when possible, resumed by a clitic pronoun (80). RhQs suggest that the answer to the question is already present or inferable from the CG; by asking ‘Who reads novels?!’ the speaker conveys the presupposition that the answer ‘No one reads novels’ is entailed in the CG. As a result, the link to the CG that licences the RD is established by default. In this sense, RD may be only an indirect by-product of their pragmatic nature, or an indirect pointing to this presupposition of shared knowledge.

- (80) *Chi li legge, i romanzi?!*
who CL reads the novels
‘Who reads novels?!’

Finally, RhQs may include the reflexive clitic *si* (81). In Italian, *si* is used in true reflexive contexts or with verbs that are inherently reflexive; sometimes, however, it occurs even though it is not required by the verb or the context. When this is the case, the reflexive is used with affective value, as an intensifier of the verb (Cordin 1995). It thus contributes to conveying the speaker’s attitude towards the answer.

- (81) *Ma chi si mangia i lime?!*
but who REFL eats the lime
‘But who eats lime?!’

The overview outlined here clearly shows that RhQ marking is a complex and non-unitary phenomenon – non-unitary in the sense that there is no one-to one correspondence between form and meaning, and complex in the sense that it can have various ingredients that are

derived from other linguistic means, each coming with their own pragmatic shades of meaning, but all somehow leading to a rhetorical interpretation. The question therefore arises how children acquire the relevant cues and when they learn to use them in the appropriate pragmatic context.

4.3 Method

Herein, I report and discuss the results of a Production task that belonged to the same battery of tasks to which belonged the tasks reported in Chapter 3. This task was designed to elicit RhQs and ISQs. For children, it was presented as a game inscribed within the fictional setting of a detective school (see 3.4), which served the purpose of motivating the various tasks and keeping the children engaged throughout. Adults completed the same task without the fictional setting.

4.3.1 Participants

Eighty-four Italian monolingual children participated in the study (age range: 5.9-10.1 years), divided into four age groups (6-, 7-, 8- and 9-year-olds). These are the same monolingual children who were tested on perception and comprehension, as reported in Chapter 3. Forty-two adults were tested as a control group. Information on age, gender and place of origin³⁴ of the five groups is summarized in **Table 8**. Further details on the recruitment and testing procedures for the children are described in 3.4. Adults were recruited through personal contacts and social media. They were informed of the goal and the methodology of the study and gave their informed consent. Monolingual adults were tested in two sessions of approximately 30 minutes each. After completion of the last session, they received an electronic gift card.

³⁴ I took place of origin into account because it may have had an impact on the preferred type of cues. Although some minor effects were observed for individual cues, the results did not change the picture nor provide relevant insights. Therefore, they were not reported in the analysis. A detailed list of regions of origin is reported in Appendix B.

Table 8. Sum of participants by group. m = male, f = female, N = Northern Italy, C/S = Central/Southern Italy.

Group	N	Age <i>M (SD)</i>	Gender	Origin
6-year-olds	24	6.5 (.3)	14 f, 10 m	14 N, 10 C/S
7-year-olds	21	7.6 (.2)	9 f, 12 m	11 N, 10 C/S
8-year-olds	20	8.4 (.3)	15 f, 5 m	14 N, 6 C/S
9-year-olds	19	9.5 (.3)	7 f, 12 m	7 N, 12 C/S
Adults	42	26 (4) [range: 18-37]	26 f, 16 m	10 N, 32 C/S

4.3.2 Materials

RhQs and ISQs were elicited through four fictitious characters. Two of them (Olaf and Rapunzel) were characterized as curious and friendly and were used to elicit ISQs. The other two (Grumpy and Drizella) were characterized as grumpy and unkind and were used to elicit RhQs. Each character was introduced with a short context, with the help of illustrations arranged in a PowerPoint presentation, that highlighted their attitude and a specific way of interacting with other characters. The two friendly characters asked curious questions (ISQs) to a group of friends ((i) and (ii) in **Table 9**), while the grumpy characters used RhQs to reply unkindly to another character, using RhQs ((iii) and (iv) in **Table 9**).

For each character, the child heard an example of a typical ISQ or RhQ (henceforth, a *model question*). The four model questions were recorded by four native speakers of Italian with intonation appropriate to the question type. **Table 9** provides a summary of the four contexts and model questions; the full contexts and instructions are found in Appendix D. The model questions for RhQs were presented in two forms. One was unmodified, presenting the minimal question form of *wh + verb + object* (iii). The second one, instead, presented some additional marking: the sentence-initial particle *ma* and RD (iv). This choice was motivated by the lack of clear predictions on the age of acquisition of the cues under analysis. We reasoned that if the children would not use any additional marking spontaneously, they may at least correctly interpret and re-use the cues of the model question.

Table 9. Summary of contexts and model question in the Production task.

Character	Summary of the context	Model question
Olaf	Olaf is a curious snowman. One day he finds some objects lying around. For example, a book of fairy tales. He asks his friends...	(i) <i>Chi legge le favole?</i> who reads the fairytales 'Who reads fairytales?'
Rapunzel	Rapunzel is very friendly. She wants to find out what her new friends like, to get to know them better. For example, she asks...	(ii) <i>Chi li mette, gli stivali?</i> who CL put-on the boots 'Who wears boots?'
Grumpy	Grumpy is always unfriendly with Snow White and replies unkindly to her. For example, Snow White asks if he eats zucchini, but he replies...	(iii) <i>Chi mangia le zucchine?!</i> who eats the zucchini 'Who eats zucchini?!'
Drizella	Drizella is always unfriendly with Cinderella and replies unkindly to her. For example, Cinderella asks if she eats melon, but Drizella replies...	(iv) <i>Ma chi lo mangia, il melone?!</i> but who CL eats the melon 'Who eats melon?!'

4.3.3 Procedure

Due to the restrictions on in person contact during the Covid-19 pandemic, the tasks were carried out online, via a Zoom videocall. The experimenter shared the PowerPoint presentation and the audio with the participant and recorded the task with the loopback registration function of the software Audacity (Audacity Team 1999). For each character in turn, the following procedure was observed. After the character's introduction and after the model question, the experimenter instructed the participant to impersonate the character, asking questions to the character's friends or replying unfriendly, using a similar sentence to the one they just heard. For each experimental item, the experimenter showed the picture of the target object (e.g., a cherry) and using a lead in to the target question, providing the desired lexical items, i.e., the verb and the object noun. For ISQs they said: "Now Rapunzel would like to know who [among her friends] eats cherries, so she asks...", letting children produce a question of the type "Who eats cherries?". For RhQs, the lead in was similar to: "Now Cinderella asks Drizella if she wants to eat cherries. Drizella replies..."

For each character, eight questions were elicited. The first two were used as practice items and discarded from the analysis; thus, a total of 12 target ISQs and 12 target RhQs

were collected for each participant. Participants were free to add particles, other lexical material or syntactic modifications to the base form of the question (wh + verb + object). The order of the characters was counter-balanced across children, as shown in **Table 10**.

Table 10. Order of model questions in the four experimental lists of the Production task.

Version A	Version B	Version C	Version D
Grumpy (RhQ)	Rapunzel (ISQ)	Olaf (ISQ)	Drizella (RhQ)
Rapunzel (ISQ)	Grumpy (RhQ)	Drizella (RhQ)	Olaf (ISQ)
Drizella (RhQ)	Olaf (ISQ)	Rapunzel (ISQ)	Grumpy (RhQ)
Olaf (ISQ)	Drizella (RhQ)	Grumpy (RhQ)	Rapunzel (ISQ)

4.3.4 Predictions

Although the study reported in Chapter 2 used a different methodology, the type and communicative function of elicited RhQs is similar; therefore, I predict adults to produce similar types of cues (particles, verb morphology, etc.), and with a similar distribution. Conversely, it is unclear whether children will produce any kind of marking, and, in case they do, of what type. This is the reason why the RhQ model questions were presented in two forms: one model RhQ was unmodified, the other one was modified by *ma* and RD. I refer to the first as the ‘unprompted’ condition, and the latter as the ‘prompted’ condition, since I prompted the use of two cues. There are three alternative scenarios. First, children may already be competent in the use of additional markers and use them spontaneously, even when not prompted by the model question (i.e., also in the unprompted condition). In this case, they should produce not only the two prompted cues, but also other types. Second, children may not use the optional markers spontaneously, but they may recognize and re-use them when they hear them in the model question (i.e., only in the prompted condition). In both of these scenarios, *ma* and RD are expected to be the most frequent cues, either by spontaneous production or by imitation. Third, children may be unable to use additional marking and be insensitive to its presence in the model question, thus not producing any cues in either condition. Given the complexity of the phenomenon and its nature of a multilevel interface, I expect it to be among the very late acquired phenomena in Tsimpli’s (2014) sense. Thus, there may be developmental differences between younger and older children.

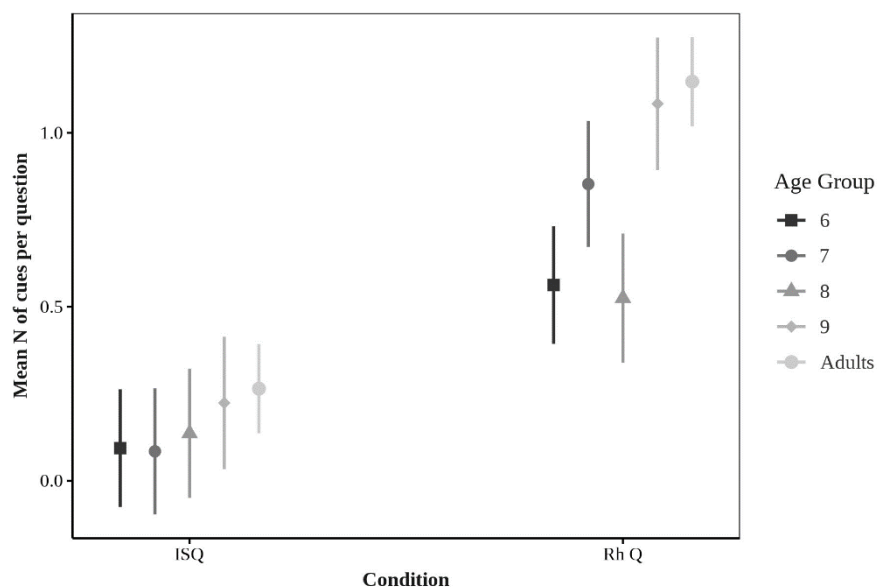
4.4 Results

4.4.1 Rate of modification

The participants' productions were transcribed and tagged for any additional marking, i.e., any lexical addition and syntactic deviation from the base structure 'wh + verb + object'. Practice items and non-target sentences (e.g., polar questions instead of wh-questions) were discarded. The final dataset contained a total of 2009 questions for children and 1001 for adults.

As a first step, I examined how frequently children and adults used additional markers in each condition. To do so, I fitted a linear mixed-effects regression model with Number of cues as DV (i.e., how many cues were present in a question); IVs were Group (5 levels: '6' vs '7' vs '8' vs '9' vs 'adults') and Condition (2 levels: 'RhQ' vs 'ISQ'). Participant was added as a random intercept. The model was fit with the *lmer* function of the R package *lmerTest* (Kuznetsova, Brockhoff, and Christensen 2017). Pairwise group comparisons with Tukey corrections of the p-value were obtained with the *emmeans* function of the *emmeans* package (Lenth 2023). Categorical IVs were coded as factors and received treatment coding.

All groups (6-, 7-, 8-, 9-year-olds and adults) used more cues in RhQs ($M = 0.88$) than in ISQs ($M = 0.17$), as shown in **Figure 10**. The difference was significant ($\chi^2(1) = 34.58$, $p < .001$). Additionally, there was an interaction between Group and Condition ($\chi^2(4) = 113.05$, $p < .001$): while there was no predicted difference between groups in ISQs, there was an age effect for RhQs. In particular, 6- and 8-year-olds used fewer additional cues than 9-year-olds (6 vs 9: $\beta = -0.52$, $SE = 0.13$, $t = -4.01$, $p < .001$; 8 vs 9: $\beta = -0.56$, $SE = 0.14$, $t = -4.13$, $p < .001$) and adults (6 vs Adults: $\beta = -0.58$, $SE = 0.11$, $t = -5.4$, $p < .001$; 8 vs Adults: $\beta = -0.62$, $SE = 0.11$, $t = -5.42$, $p < .001$). 7-year-olds were in between: they used fewer cues than adults, but the trend did not reach significance ($\beta = -0.29$, $SE = 0.11$, $t = -2.61$, $p = 0.06$). All other comparisons were not significant. In particular, 9-year-olds were not significantly different from adults.

Figure 10. Predicted values of sum of cues in a question, by condition and group.

4.4.2 Type of cues

As a second step, I calculated the frequency of each type of cue. **Figure 11** shows, for each cue, the proportion of RhQs that were modified by that cue, divided by group. **Figure 12** shows the results for ISQs. The most frequent cue was the sentence-initial particle *ma* ‘but’, present in half the RhQs produced by adults and 9-year-olds (49% each). The percentage was lower for younger children, but the highest in each group nonetheless (6: 29%; 7: 33%; 8: 20%). The second most frequent cue was RD. Again, the frequency of occurrence for 9-year-olds (32%) closely resembled that of adults (35%), while the frequency was somewhat lower in the younger groups (6: 19%; 7: 22%; 8: 12%). Another comparatively frequent cue was cleft questions (7-11%), except for 6-year-olds (1%). However, cleft questions also occurred with comparatively high frequency in ISQs (5-7%) and therefore, unlike the other cues, did not clearly set apart the two question types. Several other cues occurred with low frequencies in all groups (1-9%): the sentence-initial particle *e* ‘and’, the particle *mai* ‘ever’, conditional morphology on the verb and the presence of the reflexive clitic *si* with affective value. Only adults embedded the RhQs under the verb *volere* ‘want’. All cues except for cleft questions were either absent in ISQs, or present in negligible percentages compared to RhQs (**Figure 12**). In addition, ISQs sometimes presented a modified wh-constituent: instead of

asking ‘Who eats bananas?’, participants asked ‘Who of you eats bananas?’. This happened particularly in adults and 9-year-olds (10% each)³⁵.

Figure 11. Proportion of modified RhQs for each type of cue. want.embed = embedding under *volere*, di voi = ‘Who of you’.

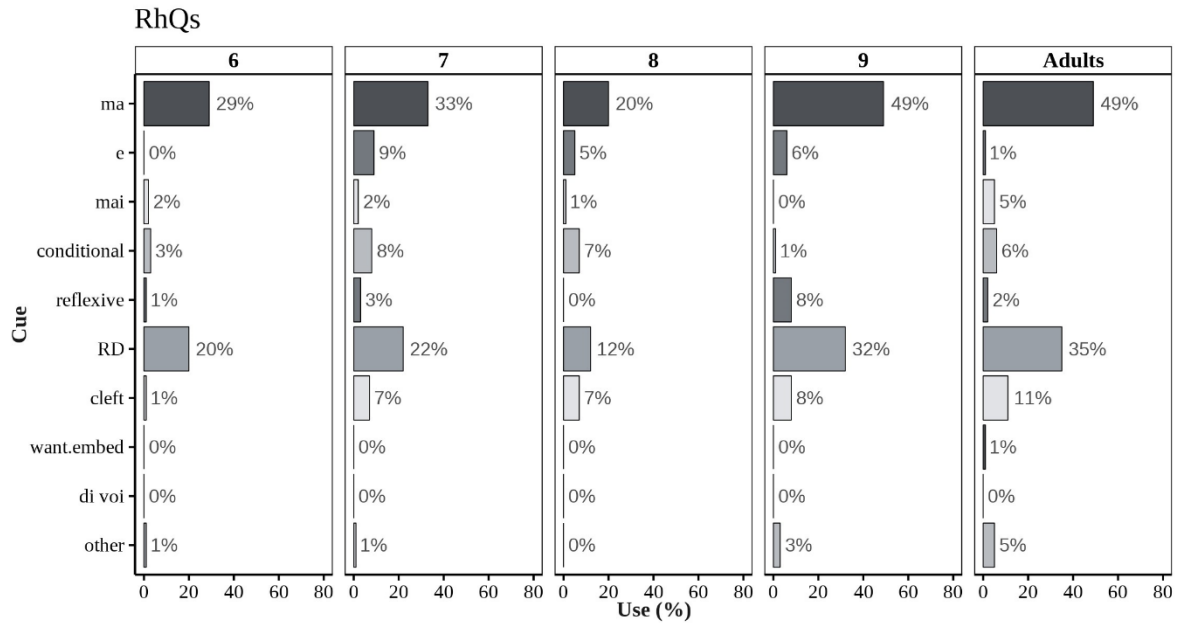
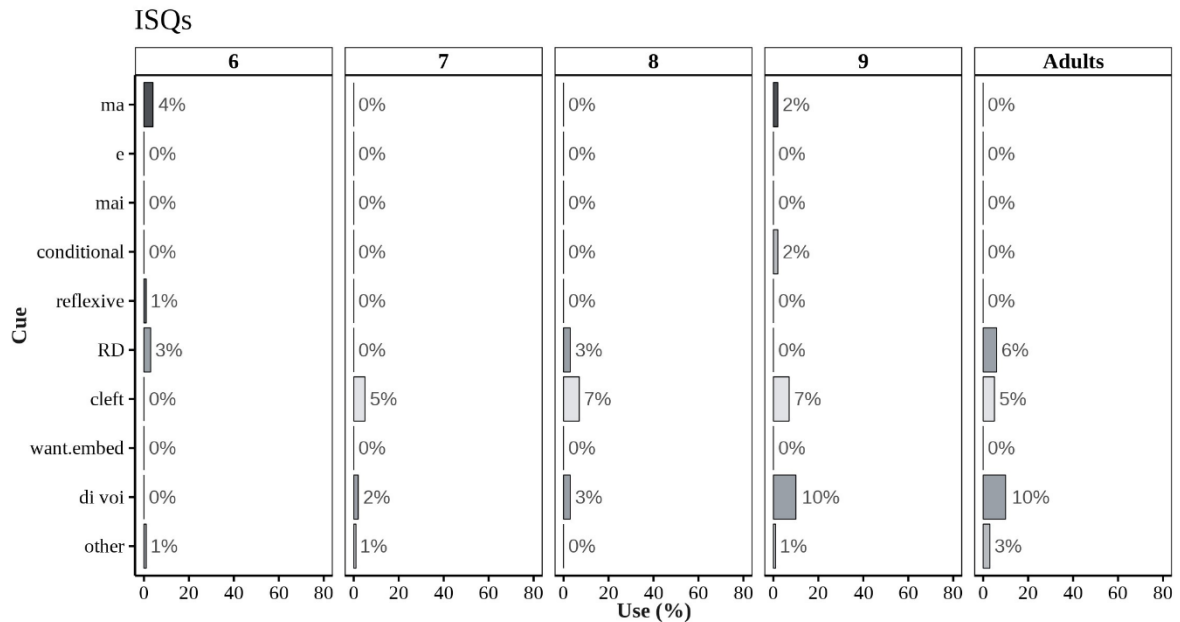


Figure 12. Proportion of modified ISQs for each type of cue.



³⁵ The same was found for German adults by Dehé, Wochner, and Einfeldt (2022).

4.4.3 Comparing ‘prompted’ and ‘unprompted’ conditions

The results illustrated in the previous section refer to all the RhQs that the participants produced, i.e., RhQs produced after hearing model question (iii) and those produced after model question (iv) (Table 9). However, model question (iv) contained the particle *ma* ‘but’ and RD, which were also the two most frequent cues in all participant’s productions. It is natural to conjecture that the model question conditioned the participants’ strategy of responding to the question. Therefore, I investigated a subset of the data, considering only the first block of RhQ elicitation for each participant. For half of the participants (version A and B), the first RhQ character’s model question was unmodified (iii, ‘unprompted’ condition). Thus, the participants’ productions were entirely original. Conversely, for the other half (version C and D), the model question was already modified (iv, ‘prompted’ condition). The comparison of these two groups allows to control for a potential priming effect of the model question. Figure 13 and Figure 14 compare the results for RhQs in the prompted and the unprompted conditions respectively. As expected, all groups used fewer additional cues in the unprompted condition than in the prompted condition ($\beta = -0.82$, $SE = 0.08$, $t = -9.85$, $p < .001$). At the same time, additional marking was not entirely absent in the unprompted condition.

The frequency of the various cues differs across age groups. 6-year-olds used only *ma* and RD in the prompted condition (62% and 46% respectively), while in the unprompted condition they did not use *ma*, and RD in only 3% of the sentences. However, they spontaneously produced other cues, such as *mai*, conditional, reflexive and clefts. 8-year-olds produced hardly any additional marking in the unprompted condition, while using a variety of cues besides *ma* and RD in the prompted condition. 7-year-olds used almost all cues in both conditions, but there was a sharp difference in the use of *ma*, present in 70% of the RhQs in the prompted condition but only in 9% in the unprompted condition. 9-year-olds, similarly to 6-year-olds, used *ma* and RD frequently in the prompted condition, with the additional spontaneous use of *e* and reflexive. In the unprompted condition a greater variety of cues was found (all but *e*). *Ma* is still the most frequent (33%), though less frequent than in the prompted condition (74%). Finally, adults used all cues in the prompted as well as in the unprompted condition (except for *e*). While *ma* was the most frequent in both cases, RD was the second most frequent only in the prompted, but in the unprompted condition there was an additional higher frequency of clefts (18%).

Figure 13. Proportion of modified RhQs, by type of cue, when model question contained *ma* and RD.

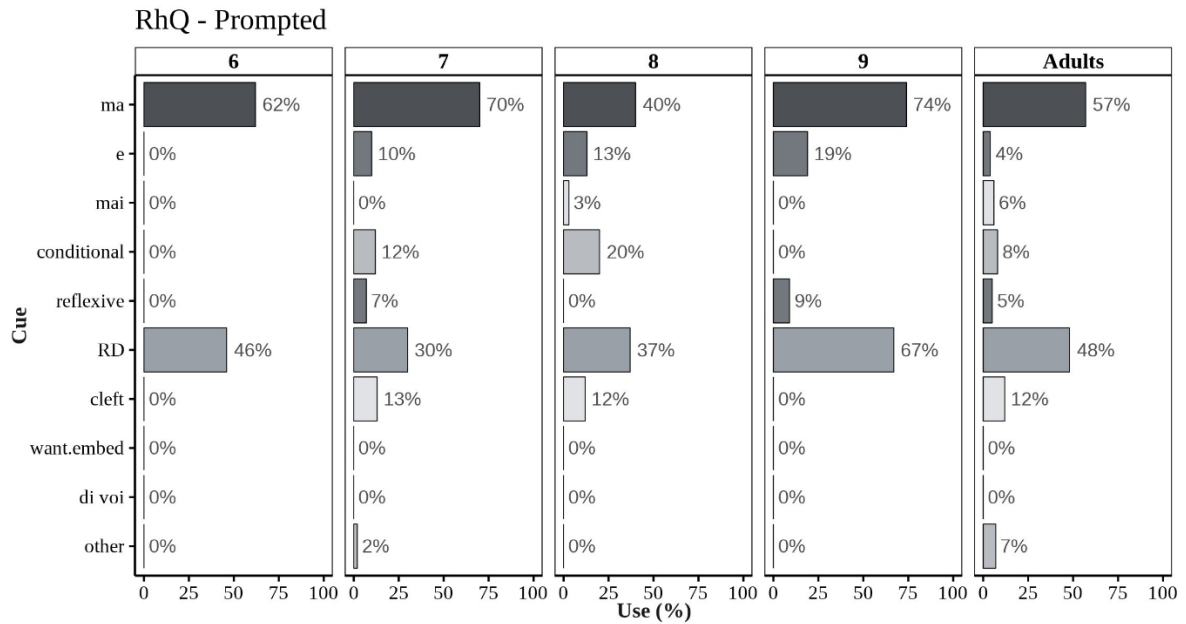
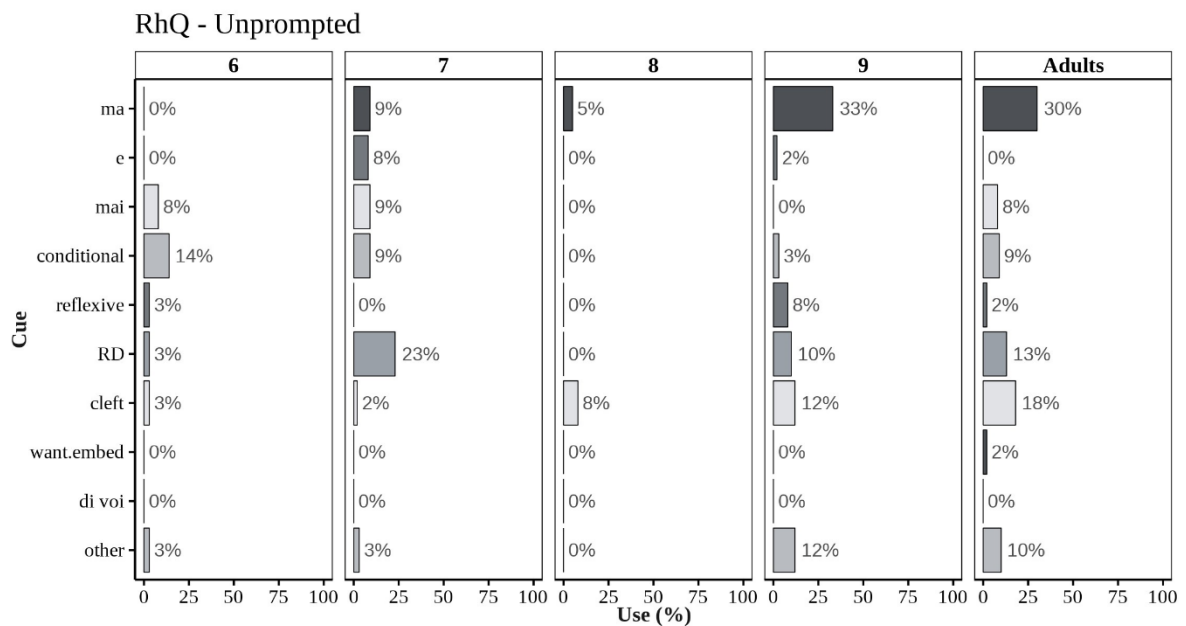


Figure 14. Proportion of modified RhQs, by type of cue, when model question did not contain *ma* and RD.



4.5 Discussion

In this chapter, I investigated whether primary school-aged children (6-, 7-, 8- and 9-year-olds) use lexical and syntactic cues to mark RhQs, which ones they use, and whether there is a developmental trajectory. I found that, overall, children of all age groups exploit the same range of cues that are also found in adult productions: sentence initial particles *ma*

and *e*, RD, adverbial particle *mai*, conditional morphology, a reflexive with affective (i.e., emotive) value. Of these, only *ma* and RD were ‘prompted’ by the model question; therefore, any other cue was produced spontaneously. The only cue that was found in adults but not in children is the periphrastic embedding under the verb ‘want’. While it is remarkable that almost all types of cues were found in each group, I am somewhat wary of taking this to imply that RhQs and their appropriate linguistic marking are already acquired by all children in this age range. In turn, I discuss in more detail the developmental patterns and my interpretation of them, and what we can learn for the acquisition of complex interface phenomena.

4.5.1 The use of rhetorical question markers during primary school

We have seen that children at all ages produce questions with markers of rhetoricity, which suggests that expressions of rhetoricity and the relevant markers are available to children at this stage. It is indeed remarkable that very fine-grained markers are already produced by children as early as 6 years old.

One might object that we cannot conclude from these production data that children are using RhQ markers with the exact same pragmatic meaning that have been defined for RhQs, especially because some markers are not exclusively rhetorical but can also occur in information-seeking questions. I agree that the exact pragmatic interpretation given by children to the question needs to be further discussed, as I do in Section 4.5.2. However, we have strong indications that single cues are used appropriately and that the questions are given a rhetorical or at least a strong non-canonical interpretation. There are three arguments that speak to this. First, children use them in the rhetorical condition and not with ISQs (cf. **Figure 11** and **Figure 12**). Second, children who use additional marking use it appropriately, i.e., in line with what is known about monolingual adult speakers of Italian. A relevant example is the use of *mai* ‘ever’. In spite of being used by only three children, it is used appropriately, i.e., in both configurations that are found in the adult language: either after *chi* ‘who’ (82) or in adverbial position in combination with a conditional (83). The interpretation of *mai* and conditional in this context, if not exclusively rhetorical, is at least strongly non-canonical, as the only other option for interpretation are Cfv-questions, which are closely related to RhQs (Hinterhölzl and Munaro 2021).

(82) *Chi mai mangerebbe una banana?! [6-year-old]*

who ever eat.COND.3SG a banana

‘Who would ever eat a banana?!’

(83) *Chi mangerebbe mai le ciliegie?! [7-year-old]*

who eat.COND.3SG ever the cherries

‘Who would ever eat cherries?!’

Third, children use some combinations of cues that strongly indicate that a proper rhetorical reading is plausible because such combinations are not appropriate in information-seeking contexts. In (84), we find the combination of *e* ‘and’, the reflexive, which contributes the emotive value, and the conditional, introducing the *irrealis* modality to the event of eating bananas, that, taken together, yield a strong rhetorical interpretation. Again, this does not imply that all children can produce RhQs, but it is crucial that some children do, which means that the acquisition process is ongoing. Other combinations are provided in (85), with *ma*, RD and conditional, and (86), with *ma*, reflexive and RD.

(84) *E chi si mangerebbe il budino?! [7-year-old]*

and who REFL eat-COND.3SG the pudding

‘Who would eat the pudding?!’

(85) *Ma chi le mangerebbe, quelle banane?! [9-year-old]*

but who CL eat-COND.3SG those bananas

‘Who would eat those bananas?!’

(86) *Ma chi se lo legge, il giornale?! [9-year-old]*

but who REFL CL read the newspaper

‘Who would read the newspaper?!’

Thus, we have strong indications that RhQ meaning and RhQ marking are available to children, in the sense that at least some children use them in an adult-like manner. Nevertheless, as outlined below, it is premature to conclude that markers of rhetoricity have been fully acquired by children at primary school age.

While, at first blush, rhetorical markers are produced in all age groups, a closer look reveals that only some children use these markers. The comparison of children at different ages further shows a developmental pattern in the overall rate of modification. Children at 6 and 8 years modify clearly less than children at 9 years, while the 7-year-old children are

in between. Thus, although not perfectly linear, there is some progression, suggesting that the phenomena and their appropriate use and distribution are still being acquired at this stage. Only 9-year-olds resemble the adult patterns across cues, which is especially evident in the spontaneous use of cues in the unprompted condition, i.e., in the absence of a model sentence. The fact that the number of cues increases over time, and not all children produce all cues, suggests a more conservative interpretation, i.e., that the phenomenon is still unstable and in the process of developing throughout the age range.

In fact, non-occurrence does not imply non-acquisition. Given that none of the cues is obligatory, we cannot say that individual children who do not produce any additional cues have not acquired them. Indeed, substantial variability is also found in adults, and not all cues were equally frequent: while *ma* and RD were employed by many individual participants in all groups (between 35 and 80%), most other cues were only present in the productions of a handful. As an example, *mai* is used only by six adults and three children (age 6, 7 and 8); the reflexive by seven adults and eight children. The only cue that no children produced is want-embedding, which is a strong cue to rhetoricity – perhaps the only unambiguous one. There are several alternative explanations for its absence. The first might be that the cue was not strongly called for by the type of context and was thus not favoured, as witnessed also by its infrequency in the adult productions. The second is that this construction is syntactically complex, as it involves embedding with subjunctive morphology on the embedded verb, and children may have avoided it or not acquired it yet.

In summary, based on our data we can confidently suggest that between 6 and 9 years of age the ability to understand and mark rhetorical meaning, as well as the ability to mark it by lexical-syntactic markers, is in the process of developing. Can we therefore consider RhQs “acquired”? This is the question I turn to next.

4.5.2 When are rhetorical questions acquired and what does it mean to acquire them?

If children produce rhetorical markers, does it mean that they have acquired RhQs? In other words, can we conclude based on our results that children have acquired the pragmatic concept of a RhQ?

If we take the single cues, one by one, the answer is ‘no’: we cannot infer whether children actually apply the desired pragmatic interpretation. All we know is that children

appropriately apply the meaning contributed by that cue. For example, if a question is modified by *ma*, it indicates that the speaker is surprised by the other character's suggestion, or that such suggestion goes against their expectations. However, while *ma* is compatible with a rhetorical interpretation, it is not restricted to RhQs. Similarly, if a question is only modified by *mai*, or even by *mai* and a conditional verb, it may indicate that the speaker cannot find the appropriate answer to the question (Coniglio 2008), but the question is not necessarily rhetorical. These are clearly semantic and pragmatic ingredients of non-canonical questions, but they need not be rhetorical per se. This means that for some markers we cannot be sure whether they are specifically rhetorical. Nevertheless, the results are novel in showing that children can appropriately use pragmatic markers to express additional pragmatic meanings, because they use them only in the appropriate context and not, for example, in ISQs. Additionally, as has been shown above, some children accumulate more than one cue, thus strengthening the probability that the desired interpretation is achieved.

Looking exclusively at overt manifestations of rhetorical meaning is problematic, given that this type of interpretation can also be expressed without overt marking, or with cues beyond those we have investigated in this paper, specifically prosody and gestures. Besides, adults vary in terms of how often they explicitly mark rhetoricity. Just like adults, some children use markers and others do not. As argued above, the developmental pattern at the group level is telling. As long as adult levels of use are not reached, it is likely that development is ongoing.

Finally, these children were also tested on their comprehension of lexical-syntactic and prosodic cues, as reported in Chapter 3. All children, except a minority of 6-year-olds and a few outliers in the other groups, recognized *ma* as a marker of a rhetorical or a non-canonical question. In that task, no group was at an adult-like level in the other conditions: Even within 9-year-olds, some children had not acquired the relevant prosodic cues. Taken together, the two studies indicate that children in the investigated age period, including 9-year-olds, are still developing but have not yet fully developed the mapping between the various possible cues to RhQs and this pragmatic function.

4.6 Conclusion

In this chapter, I have investigated the acquisition of optional pragmatic markers in non-canonical questions. Since the theory on RhQs is still in the process of developing, especially

in terms of their syntactic and semantic correlates, I have taken a data-driven approach to acquisition, taking adult productions as the target to be reached. I have shown that children between age 6 and 9 make appropriate use of lexical-syntactic markers for pragmatic purposes, such as discourse particles and conditional verbal morphology. While 9-year-olds were similar to adults, younger children point to an ongoing acquisition process, at least at the group level. Our findings suggest that RhQs are among the very late acquired phenomena (Tsimpli 2014), and this is consistent with their nature of extremely multidimensional phenomena, at the crossroads of pragmatics, semantics, syntax and phonology.

Some paths remain open for further exploration. First, while I focused on lexical-syntactic marking, prosody is an important cue in the marking of RhQs and its acquisition should be investigated as well. Second, while I have offered an overview of the cues that are found in a specific kind of elicitation context, each cue should be investigated in more detail, combining experimental approaches (including comprehension) with longitudinal studies of naturalistic production. Third, such late acquired phenomena provide an interesting testing group for language contact settings, where these have been shown to be particularly vulnerable. I turn to this issue in Chapter 5.

Chapter 5. THE BILINGUAL ACQUISITION OF LEXICAL AND SYNTACTIC CUES IN RHETORICAL QUESTIONS

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5.1 Introduction

In this chapter, I investigate the acquisition of lexical-syntactic markers in RhQs by bilingual children, with a focus on the heritage language (HL). In Chapter 4, I have shown that Italian monolingual acquirers in their primary school years are in the process of developing the optional markers for RhQs and their appropriate contextual use. The investigation of the same phenomenon in bilingual acquisition is novel and interesting in at least two ways. First, by comparing two different populations, it allows the comparison of two modes of acquisition of the same phenomenon, which has to date never been investigated. Second, it ties in with a larger body of literature on the bilingual acquisition of pragmatics from an original angle.

The banner term “pragmatics” features in two different lines of research in bilingual acquisition studies, both of which can be considered “late acquired”, meaning that acquisition might still be ongoing during primary school. Firstly, the acquisition of pragmatics is studied from the point of view of communication, focusing on the development of socio-communicative skills (e.g., Antoniou et al. 2020), i.e., to the ability to successfully cooperate in a conversation, conveying and interpreting not only the literal meaning of expressions, but also the underlying intended messages and goals of communication. This line of research has largely shown that growing up with two languages constitutes an advantage, even if the respective phenomena are acquired at a relatively late age. Indeed, several studies found no difference between bilingual and monolingual children (Antoniou et al. 2020; Syrett et al. 2017); some even found a bilingual advantage, resulting in earlier development (Siegal, Iozzi, and Surian 2009; Siegal et al. 2010; Yow and Markman 2015), arguably due to better executive control (Bialystok 2017; Siegal, Iozzi, and Surian 2009). The second type of research in relation to pragmatics involves the so-called interfaces, i.e., those phenomena that involve an interplay between language-specific skills and pragmatic inferencing or the integration of (non-linguistic) contextual information. In this type of phenomena (such as the use of referential expressions, just to name one), the ability to interpret the context and to make pragmatic inferences has a direct impact on the appropriate production and interpretation of linguistic expressions in the target language (e.g., the appropriate use of a certain type of pronoun in a certain context). Such phenomena are challenging for monolingual learners, but even more for early bilingual learners (Laleko and Polinsky 2015; Serratrice, Sorace, and Paoli 2004; Serratrice et al. 2009).

In this chapter, I investigate the bilingual acquisition of RhQs (henceforth RhQs), a phenomenon which shares some aspects with both aforementioned lines of research. In terms of communication, when uttering a RhQ (87), a speaker does not intend to ask for a piece of missing information, because they think that the answer to the question is already obvious (Biezma and Rawlins 2017; Caponigro and Sprouse 2007; Rohde 2006 a.o.). On the contrary, the speaker uses the interrogative form to point out that the answer is obvious, and they wish to put forth a “rhetorical point” (Farkas 2023) (in (87), that cooking liver is absurd and the idea should be abandoned).

- (87) The speaker’s husband wants to cook liver for a dinner with friends. The speaker finds it absurd, because obviously no one likes liver. She says:
- a. *Who eats liver?!*
 - b. *Who the hell eats liver?!*
 - c. *Come on, who would ever eat that stuff?!* (adapted from Neitsch 2019)

Thus, RhQs constitute an indirect form of language: while they retain interrogative syntax and the semantic form of a question; pragmatically they “feel” more like an assertion (Biezma and Rawlins 2017; Caponigro and Sprouse 2007). Moreover, RhQs are used by the speaker as a rhetorical strategy to express an opinion or a point of view, to challenge the interlocutor (Ilie 1994; Rohde 2006), or to strengthen a previous point (Ilie 1994). Thus, they are always strictly connected to the discourse context and the situation, and they often express the speaker’s emotive attitude (see Neitsch 2019 for a comprehensive overview). In this respect, RhQs are part of socio-communicative speech, similar to ironic language and conversational understanding, since they require complex reasoning on the participant’s intentions and goals and the interpretation of a mismatch between literal and intended meaning.

In addition, RhQs constitute a multiple interface, since they require the integration of different types of linguistic cues, lexical, prosodic and syntactic with the pragmatic function of the question. For example, (87a) is neutral and may be distinguished from a canonical ISQ only through the context or by a different prosodic form (Dehé, Wochner, and Einfeldt 2022). (87b) contains the expression *who the hell*, which overtly expresses the speaker’s negative attitude (Dikken and Giannakidou 2002). (87c) contains the allocution *come on*, which expresses the speaker’s attitude and a call on the addressee, the conditional *would* and the adverb *ever*, which convey that the event is impossible to happen, and a lexical

expression with a negative connotation (*that stuff*). Here, different cues combine to express beyond doubt the speaker's intended meaning. Crucially, the use of such cues provides the listener with a more or less direct indication that the question should be interpreted rhetorically, but none of them is obligatorily present in a RhQ, nor are they markers of "rhetoricity" themselves. Additionally, such cues are language specific, so bilingual speakers need to learn the individual cues of each of their languages.

The duality between the communicative function of RhQs and their interface nature makes them an interesting, yet unexplored topic in bilingual acquisition. Tsimpli (2014) distinguishes between early, late, or very late acquired phenomena. By age 5, children have acquired the formal properties of their native language(s) if they are exposed to them early enough. Phenomena that involve semantic computation and discourse integration are acquired later (around 6 years), and the decisive factor in determining their acquisition in bilinguals is the amount of language experience. Phenomena that require pragmatic competence and the integration of language external and language internal aspects, such as pronominal reference, are acquired even later (in later childhood or later adolescence) and are thus even more vulnerable to reduced language experience. I expect optional pragmatic marking in RhQs to fall within the latter category. By contrast, the conversational competence necessary to acquire RhQs as a pragmatic category, while still late acquired, is not expected to pose a greater challenge for bilingual children. Therefore, there is a conflict between bilingual children's potential difficulties with language-specific interface phenomena vis-à-vis their early pragmatic (and metalinguistic) awareness compared to monolingual children.

In this chapter, I investigate the patterns of optional pragmatic marking in RhQs in Italian monolingual and bilingual children aged 6-9 years. For the bilingual children, Italian is the HL (i.e., the family language), while their ML is German. In what follows (5.2), I describe the patterns of optional RhQ modification in Italian and reviews facts on pragmatic acquisition in monolingual and bilingual children. Section 5.3 presents the goal and research questions of this study. Sections 5.4 and 5.5 present methods and results of the study. I conclude with a discussion of the findings (5.6).

5.2 Background

The cues that appear in the relevant RhQ contexts have been extensively discussed in Chapter 2 and put in the context of monolingual acquisition in Chapter 4. In German, RhQs

are often marked by discourse particles, such as *denn* and *schon* (Bayer and Obenauer 2011; Biezma and Rawlins 2017). *Denn* is compatible both with an ISQ and a RhQ; similarly to RD in Italian, it establishes a link to the context. Conversely, when used as a discourse particle, *schon* is considered an unambiguous signal for RhQs, although it is homophonous with the temporal adverb *schon* ‘already’ (88).

(88) *Wer mag schon Bananen?!*

who likes PRT bananas

‘Who eats bananas?!’

(Geiss et al., 2023)

RhQ marking is a non-unitary phenomenon, since there is no one-to-one correspondence between form and meaning. It can have various linguistic components, each with their own pragmatic shades, which converge in conveying rhetorical meaning.

5.2.1 The (bilingual) acquisition of pragmatics

The acquisition of RhQs has only been investigated in three studies so far (Ferin and Geiss 2022; Geiss et al. 2023; Recchia et al. 2010). Recchia et al. (2010) have investigated irony in naturalistic speech, including RhQs, focussing on their contextual dimension. They found that 4- and 6-year-old children could both produce and appropriately respond to RhQs and other forms of irony, older children more frequently than younger children. Thus, young children can produce or interpret an interrogative utterance in a non-canonical way, i.e., not as a simple request for information. In Chapter 3 (see also Ferin and Geiss 2022), I showed that both monolingual and bilingual children in Italian are able to exploit a combination of lexical-syntactic and prosodic cues to discriminate between ISQs and RhQs in comprehension, but that this ability is not yet completely acquired between ages 6 and 9. Importantly, Geiss et al. (2023) showed that the same bilingual children behaved similarly also in their ML German. In this set of studies, questions were presented out of context, so that children had to rely exclusively on the linguistic form of the question. The results showed no difference based on proficiency across children in their dominant language (Geiss et al. 2023), while language experience affected the children’s performance in the HL (Ferin and Geiss 2022).

RhQs require the ability to detect the discrepancy between the form of the utterance (a question) and the real intention of the speaker when uttering it (the rhetorical point).

Thus, the interpretation of this type of language relies on context and world knowledge, and it requires additional mental effort to integrate background information and interpret the speaker's intentions. In this respect, RhQs are similar to a number of some other pragmatic phenomena, which fall into the category of late acquired phenomena.

RhQs are often discussed in relation to irony (Neitsch 2019), which is still developing around age 6, both for monolingual children (Banasik 2013; Falkum and Köder 2020; Giustolisi, Panzeri, and Bogani 2017) and bilingual children (Banasik and Podsiadło 2016). Similarly, for the acquisition of conversational maxims (in the sense of P. Grice 1989), the years between 5 and 6 seem to be an important cut-off point: only after this point are children able to detect violations to conversational maxims (Foppolo, Guasti, and Chierchia 2012; Siegal, Iozzi, and Surian 2009; Siegal et al. 2010). Interestingly, bilingual children outperformed age-matched monolingual peers in this task, even if their L2 vocabulary was comparatively delayed (Siegal, Iozzi, and Surian 2009; Siegal et al. 2010), showing a comparatively more developed competence in conversational reasoning.

A fair number of studies have been concerned with scalar implicatures. Foppolo, Guasti, and Chierchia (2012) found a cut-off point at 6 years in children's ability to derive scalar implicatures, which requires both the lexical-semantic knowledge of the quantifiers (*some*, *all*), their ordering in a scale (semantic knowledge), and pragmatic reasoning. Children younger than 6 years varied substantially in their responses and some were unable to derive the implicature correctly, even if they already had knowledge of conversational maxims and lexical-semantic knowledge of the quantifiers (Foppolo, Guasti, and Chierchia 2012). This indicates that even when children have all the necessary components in place, linguistic (representation) and pragmatic (reasoning), they may still struggle to integrate them. Relatedly, Papafragou et al. (2018) demonstrated that five-year-old children could already reason on the speaker's mental state when interpreting a semantic phenomenon, which is relevant to computing scalar implicatures. Bilingual children were shown to have more difficulties in computing implicatures than monolingual children (Syrett et al. 2017), but when a richer pragmatic context was provided, making the computation of the implicature conversationally relevant, their performance improved to adult-like levels. Antoniou et al. (2020) tested monolingual, bilingual, and bidialectal children aged 10 to 12 years on a range of pragmatic tasks based on Gricean maxims, including scalar implicatures. Although bilingual children had lower vocabulary scores, their pragmatic skills did not differ from those of monolingual children. The study found neither a bilingual advantage

(perhaps because older children were tested), nor a disadvantage, suggesting that pragmatic skills are independent of language-specific competence.

In summary, pragmatic competence is generally late acquired (5 years or later), but bilingual children don't seem to show any disadvantages; if anything, they appear to benefit from their wider language experience. The picture is quite different for phenomena that require integration of pragmatic competence with language-specific phenomena. This has been studied mostly in the context of referential expressions, with bilingual children using null or overt pronouns at different rates than monolingual children (Hulk and Müller 2000; Serratrice, Sorace, and Paoli 2004), but also in discourse-based word order patterns used by Italian-German bilingual children (Listanti and Torregrossa 2023). For bilingual adults, it has been shown that language-specific strategies to express requests with the appropriate degree of politeness undergo CLI from the ML into the HL (Avramenko and Meir 2023; Dubinina and Malamud 2017; Keevallik 2012; Pinto and Raschio 2007). Divergences include the choice of utterance type (imperative, question), the use of modals and modality, the use of particles and negation and lexical items such as *please*.

5.2.2 Optionality and variation

Markers of rhetoricity are optional because RhQs can be produced without any lexical or syntactic cues. Therefore, there is variability in the manifestation of RhQs. Several studies have investigated the acquisition of other variable phenomena. For example, adjectives in the Romance languages can be pre- or postnominal, and each position comes with a slightly different meaning (e.g., Nicoladis 2006); the presence or absence of determiners with plural nouns in the Germanic languages signals a specific vs. generic reading (Kupisch 2012; Serratrice et al. 2009); the presence or absence of pronouns signals contrast or topic shift (e.g., Serratrice, Sorace, and Paoli 2004). These phenomena have been of particular interest in studies of early bilinguals, especially when one of the two languages in contact did not exhibit variation. The prediction was that the option that is present only in one language (i.e., prenominal adjectives, overt articles, overt pronouns) would be overused at the expense of the option that is present only in one language.

Crucially, in the aforementioned examples, each option comes with a difference in meaning and the languages provide contextual cues to infer these meanings, even if subtle. The situation is different with RhQs, because markers of rhetoricity are “truly” optional, as RhQs can exist without any cues to rhetoricity. They are part of colloquial language,

showing subtle linguistic abilities that allow the speaker to express attitudes or epistemic relations between participants in a conversation. It is unclear how bilinguals deal with this type of variation. Bilinguals might not use any optional markers as a strategy of representational simplification, or they may use them more abundantly because pragmatic marking can be transferred more easily between languages.

5.3 Research questions and hypotheses

This study aimed at investigating how Italian bilingual children produce RhQs and whether they exploit the optional pragmatic markers available in their HL. I address the following research questions.

- **RQ1** At what age do bilingual children mark information-seeking and rhetorical questions in their heritage language?
- **RQ2** Are there differences between monolingual and bilingual children?
- **RQ3** Do proficiency in Italian and language dominance play a role?

In Chapter 4, I showed that at the group level monolingual Italian children aged 6 to 9 (the same children who serve as baseline in the present study) could appropriately exploit the same types of cues as adults in RhQ marking, with a progressive development from age 6 to age 9; 9-year-olds showed an adult-like pattern both when prompted by the use of *ma* and RD and when not prompted. What are the predictions for bilingual children? Bilingual children may show effects of CLI. Classically, CLI has been discussed in terms of acceleration, delay (henceforth “deceleration”) and transfer (Paradis and Genesee 1996). In the case of acceleration, bilingual children are expected to use rhetorical markers at an earlier point in time compared to age-matched monolinguals. Acceleration may not necessarily be induced by the influence of German (the ML), but rather from a general pragmatic advantage in bilingual children (see 5.2.1): bilingual children’s earlier ability to interpret speaker intentions and knowledge may manifest itself as an earlier awareness of the opportunity of overtly marking RhQs. In the case of deceleration, children would use rhetorical markers later compared to monolingual children of the same age. Deceleration may be caused by a number of reasons: lack of lexical knowledge of the specific cues, lack of knowledge of their specific pragmatic function, or difficulty at integrating different dimensions of language. Transfer could consist in the use of specific markers in language B that are absent in language A (e.g., the translation equivalent of a German marker along with its syntactic properties in an Italian context, or a lexical item directly borrowed from

German). Children may be aware that they need to use some form of marking but may use the resources of the ML (German), using a German marker in an Italian RhQ to achieve the goal, which would result in transfer.

Finally, since the phenomenon is optional and late acquired, we expect to find high variability based on bilingual children's proficiency, on the one hand, and on language dominance on the other. I tease apart proficiency from a dominance measure based on experience for the following reason. By zooming in on the bilingual children's competence in the HL, we can compare them to monolinguals based on the same measures. By means of a dominance measure, instead, we can see the bilinguals' two languages in relation to each other.

5.4 Method

Details of the participants and of the tasks that are of interest in this chapter (i.e., the Production task and the Narrative task) have already been described in detail in the previous chapters. In this section, I will summarise the main points; the reader is referred to the relevant sections (3.4.2 for the Narrative task, 4.3 for the Production task) for further details.

The experiment took place online, in a Zoom[®] videocall with the child. The experimenter shared their screen and computer audio with the participant and recorded the tasks with Audacity (Audacity Team 1999), using the loopback function. The Narrative task was administered before the Production task. Bilingual children completed the tasks in both Italian and German, with a break of at least one week in-between. The order of the two languages was counter-balanced across children.

5.4.1 Participants

The participants to the study are the 88 Italian-German bilingual children and 84 Italian monolingual children, aged 6-9, who were also tested on Perception and Comprehension (Chapter 3); the monolingual children's performance in this task in comparison with adults was analysed in Chapter 4 and is used here as a baseline for bilingual children. Statistics for the four age groups (6-, 7-, 8- and 9-year-olds) are repeated in **Table 11**. Further details can be found in Section 3.4.1.

Table 11. Aggregated statistics for bilingual participants, divided by age group. f = female, m = male.

Age group	N	Age <i>M (SD)</i>	Gender	Speech rate <i>M (SD)</i>	VOCD score <i>M (SD)</i>	Irony score <i>M (SD)</i>	Experience dominance <i>M (SD)</i>
6-year-olds	25	6.4 (0.3)	16 f, 9 m	1.6 (0.4)	20.7 (5.8)	.87 (.16)	4.7 (4.2)
7-year-olds	22	7.5 (0.3)	11 f, 11 m	1.4 (0.6)	23.0 (8.4)	.92 (.15)	5.6 (4.0)
8-year-olds	18	8.7 (0.2)	12 f, 6 m	1.9 (0.3)	22.8 (5.7)	.99 (.04)	2.3 (6.1)
9-year-olds	23	9.5 (0.3)	7 f, 16 m	1.7 (0.4)	21.8 (6.5)	.98 (.08)	5.4 (5.8)

5.4.2 Production task

Bilingual children were tested on the Production Task (Section 4.3) in both of their languages. RhQs and ISQs were elicited by presenting them as the typical form of interaction of four different characters, two curious and inquisitive (used to elicit ISQs), and two unfriendly and unkind (used to elicit RhQs). Each character was introduced with a focus on their attitude. After each character's introduction, the child heard a "model question", i.e., an example of a typical ISQ or RhQ that the character would utter in the context (see (i-iv) in **Table 12**). The model questions for RhQs were presented in two forms. One was unmodified, presenting the minimal question form of *wh + verb + object* (ii) ('unprompted' condition). The second one, instead, included some additional cues: the sentence-initial particle *ma* and RD (iii) ('prompted' condition). The four characters were presented in a counter-balanced order across children; some children encountered the modified model sentence first, while others encountered the unmodified one first. After hearing the character's introduction and the model question, children were instructed to impersonate the character and use similar sentences, either to ask questions to the character's friends (ISQs) or to retort to the secondary character (RhQs). Eight questions were elicited in each context, but the first two were discarded as practice items. Thus, the final dataset consisted of 12 ISQs and 12 RhQs for each participant.

Table 12. Summary of contexts and model question in the Production task.

Character	Summary of the context	Model question
Olaf	Olaf is a curious snowman. One day he finds some objects lying around. For example, a book of fairy tales. He asks his friends...	(i) <i>Chi legge le favole?</i> who reads the fairytales 'Who reads fairytales?'
Rapunzel	Rapunzel is very friendly. She wants to find out what her new friends like, to get to know them better. For example, she asks...	(ii) <i>Chi li mette, gli stivali?</i> who CL put-on the boots 'Who wears boots?'
Grumpy	Grumpy is always unfriendly with Snow White and replies unkindly to her. For example, Snow White asks if he eats zucchini, but he replies...	(iii) <i>Chi mangia le zucchine?!</i> who eats the zucchini Who eats zucchini?!'
Drizella	Drizella is always unfriendly with Cinderella and replies unkindly to her. For example, Cinderella asks if she eats melon, but Drizella replies...	(iv) <i>Ma chi lo mangia, il melone?!</i> but who CL eats the melon 'Who eats melon?!'

Children's productions were transcribed; non-target sentences (polar questions such as 'Does anyone eat bananas?/?!', or exclamative utterances such as 'But no one eats bananas!') were removed from the dataset ($n = 12$). The final dataset consisted of 4121 test questions. Questions were tagged for lexical-syntactic cues. Any relevant lexical addition or morpho-syntactic modification of the base form *wh+verb+object* was tagged by type of cue, assigning '1' if a cue was present and '0' if it was not present. I calculated the sum of the number of cues modifying a sentence; a sentence may be modified by no additional cue, by one cue, or by more than one at the same time.

The statistical analysis was conducted in R by fitting linear regression models with the function *lm* in the *stats* package (R Core Team 2023) or linear mixed-effect regression models with the *lmer* function in the *lme4* package (Bates et al. 2015). Estimated marginal means, trends, and post-hoc comparisons were obtained with the *emmeans* and *emtrends* functions in the *emmeans* package (Lenth 2023).

5.4.3 Proficiency and language dominance measures

In this chapter, I employ the same proficiency and experience measures that I used as background measurements for the Comprehension task (Chapter 3). While proficiency is considered only for Italian, in order to compare monolingual and bilingual children on the same measures, language experience is used as a measure of dominance, by subtracting the Italian from the German value (see detailed discussion in 3.4.2).

For direct measures, all children were administered the Italian version of the MAIN narrative task (Levorato and Roch 2020) in the retell modality; the standard MAIN procedure was adapted for online testing. Bilingual children were administered also the German version (Gagarina et al. 2019). The narratives were recorded and later transcribed in the CHAT format with the software CLAN (MacWhinney 2000). Two measures were extracted: VOCD and speech rate (words/s). Both are considered possible measures of linguistic proficiency in bilingual speakers (Benmamoun, Montrul, and Polinsky 2013). For bilingual children, the measures were extracted in both languages (see 3.4.2.1 for further details).

The indirect measure of language dominance represents the children's language experience, as reported by the parents (see 3.4.2.2). The questionnaire gathered information about the amount of Italian and German experience in the family, during free time, and in educational settings, the number of people the child speaks Italian and German to, length and frequency of periods spent in Italy, and use of Italian and German for reading and multimedia activities. I calculated four sub-scores ('formal quantity', 'formal quality', 'informal quality' and 'informal quantity' of exposure in each language, considering only current exposure). Each sub-score was proportioned to a maximum of five points each; the four sub-scores were added to calculate an 'Italian experience score' and a 'German experience score'. The Dominance score was then obtained by subtracting the Italian from the German score. Positive scores indicate German dominance, and negative scores indicate Italian dominance.

Aggregated results for the three measures are reported in **Table 11** above. Mean values for Italian VOCD show a different pattern across age groups for bilingual and monolingual children. While the monolinguals' VOCD increases from age 6 ($M = 21.7$) to age 9 ($M = 29.4$), this is not observed in the bilingual group (age 6: $M = 20.7$; age 9: $M = 21.8$). The statistical significance of the effect was confirmed by a linear regression model with Italian VOCD as DV and an interaction between the IVs Group (2 levels: 'Bilingual' vs

‘Monolingual’) and Age (continuous). The interaction was significant ($F(1) = 5.73$, $p = .018$), confirming that the increase with age was significant for monolinguals ($\beta = 2.3$, $SE = 0.6$, $t = 3.87$, $p < .001$) but not for bilinguals ($\beta = 0.36$, $SE = 0.55$, $t = 0.66$, $p = .511$).

Speech rate in Italian was overall higher for monolingual children; 6-year-olds uttered on average 1.8 words per second ($SD = 0.4$) and 9-year-olds 2 words per second ($SD = 0.4$), with 7- and 8-year-olds in-between. The pattern observed for the bilingual children was less linear, with 7-year-olds having the lowest speech rate ($M = 1.4$, $SD = 0.6$) and 8-year-olds the highest ($M = 1.9$, $SD = 0.3$). Still, a linear model fitted with Italian speech rate as DV and Group and Age as IVs found a significant main effect of age for both groups ($F(1) = 9.7$, $p = .002$), as well as a main effect of Group ($F(1) = 17.32$, $p < .001$), with monolinguals having on average a faster speech rate than bilinguals ($\beta = 0.27$, $SE = 0.07$, $t = 4.16$, $p = .001$). The interaction term was removed because not significant.

Finally, for dominance, the mean scores at the group level are mostly positive indicating that children tend to be more exposed to German than to Italian. However, at the individual level, children ranged from negative to positive scores, indicating that the relative strength of Italian and German varied in the sample. A linear regression with Dominance as DV and Age as IV found no significant effect of age on dominance ($F(1) = 0.14$, $p < .714$).

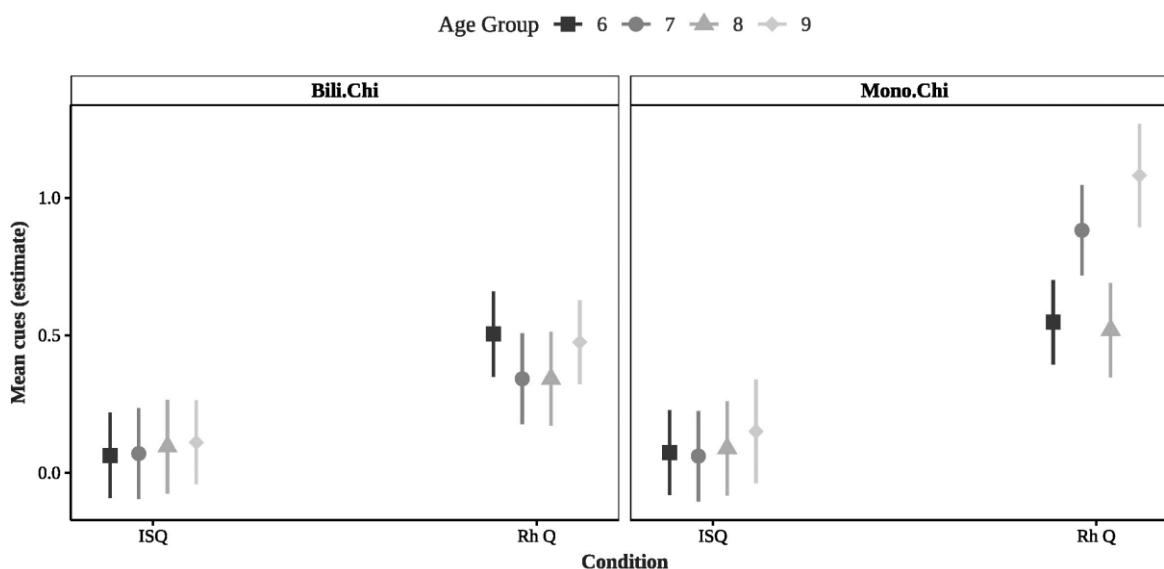
5.5 Results

5.5.1 Quantitative analysis of additional modification

I first investigated how many cues on average modified each type of question. I fitted a linear mixed-effects regression model to see if the Number of cues modifying a question (DV) was predicted by Group (2 levels: ‘Monolingual’ vs ‘Bilingual’), AgeGroup (4 levels: ‘6’ vs ‘7’ vs ‘8’ vs ‘9’) and Condition (2 levels: ‘RhQ’ vs ‘ISQ’). To control for possible effects of linguistic proficiency, I included also Italian VOCD (continuous, scaled) and Italian speech rate (continuous, scaled) as fixed effects. The model included three three-way interaction terms between Group, Condition, and AgeGroup/VOCD/Speech rate respectively. Participant and Item were included as random effects. Categorical variables were treatment-coded and continuous variables were scaled.

The three interactions were statistically significant. Firstly, Group, Condition and AgeGroup interacted significantly ($\chi^2(3) = 66.97, p < .001$), as shown in **Figure 15**. The interaction plays out as follows. In both groups, ISQs did not receive much additional modification, neither by monolingual ($M = 0.09, SE = 0.05$) nor by bilingual children ($M = 0.08, SE = 0.04$). There was no difference between groups, nor between different age groups. In contrast, RhQs were modified at different rates by monolinguals ($M = 0.76, SE = 0.05$) and bilinguals ($M = 0.42, SE = 0.04$), and the difference was significant ($\beta = -0.34, SE = 0.06, z = -5.85, p < .001$). Furthermore, within RhQs, an effect of age group was found only for monolinguals, but not for bilinguals. Within monolingual children, 9-year-olds modified substantially more than the other groups ($M = 1.1, SE = 0.1$). 7-year-olds were in-between ($M = 0.9, SE = 0.1$), while 6- and 8-year-olds used fewer cues (6: $M = 0.6, SE = 0.1$; 8: $M = 0.5, SE = 0.1$). The difference between 9- and 7-year-olds on the one hand, and 6- and 8-year-olds on the other hand was statistically significant³⁶. For bilinguals, on the other hand, no difference was observed between age groups. All the comparisons are reported in Appendix F.4.2.

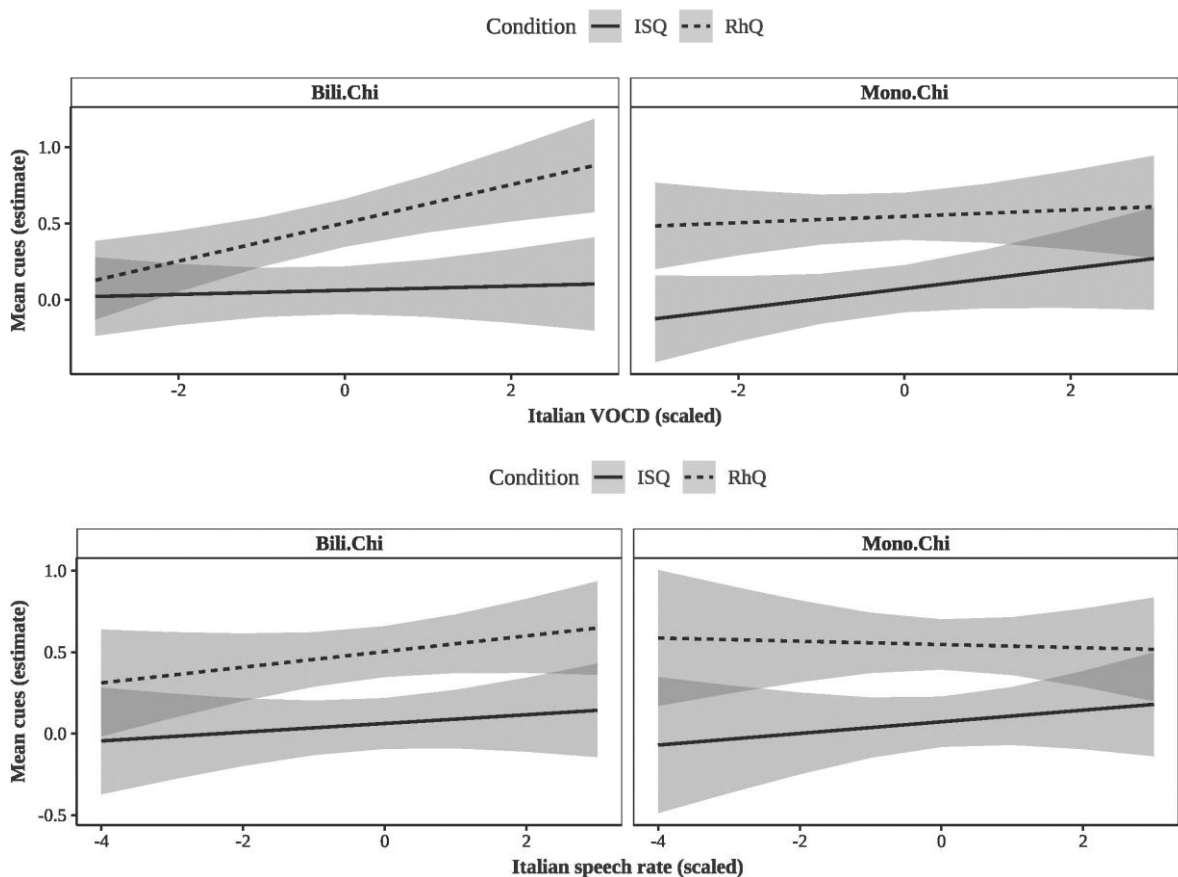
Figure 15. Estimated mean number of cues modifying ISQs and RhQs, by group and age group.



³⁶ The significance of the comparisons for monolingual children are slightly different than what was found in the model reported in Chapter 4, Section 4.4.1. This is not too surprising, given that the overall variance in the two models is different because it includes different groups, yielding different model structures. This, in turn, is likely to affect the adjusted p-values of the multiple comparisons. Nevertheless, the trends are substantially confirmed in both analyses.

I further found a significant interaction between Group, Condition and Italian VOCD ($\chi^2(1) = 25.04, p < .001$), represented in **Figure 16** (top panel). Higher vocabulary knowledge did not affect the rate of modification of ISQs in either group (Monolingual: $\beta = 0.07, SE = 0.05, z = 1.44, p = .15$; Bilingual: $\beta = 0.01, SE = 0.04, z = 0.34, p = 0.73$), nor that of RhQs for monolingual children ($\beta = 0.02, SE = 0.05, z = 0.46, p = .65$). However, it did have a positive effect on RhQ modification in bilingual children ($\beta = 0.13, SE = 0.04, z = 3.14, p = .002$). The effect is substantial: while at very low VOCD values bilingual children used almost no additional cues (e.g., when VOCD is -2 SD: $M = 0.17$), children with higher vocabulary knowledge used substantially more cues (e.g., at +2 SD: $M = 0.67$).

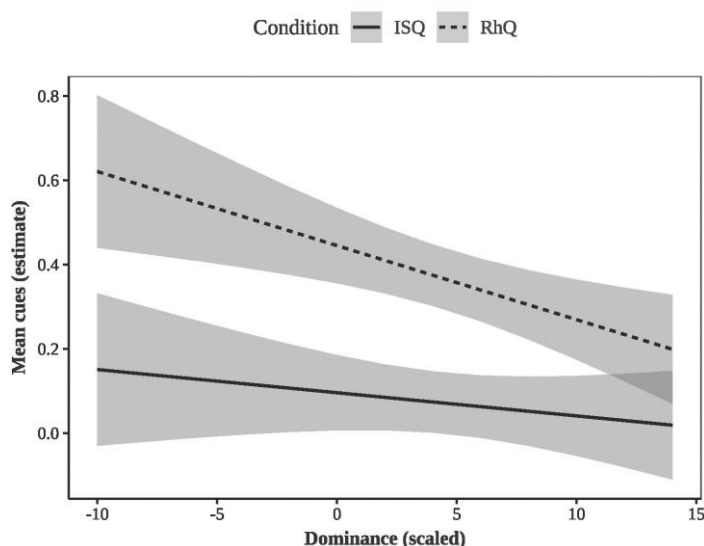
Figure 16. Effect of Italian VOCD (top) and Italian speech rate (bottom) on the estimated mean number of cues per sentence, by group and age group.



Finally, the overall interaction between Italian speech rate, Condition and Group was significant ($\chi^2(1) = 4.41, p = .036$), but the pattern was less clear than for VOCD. None of the slopes shown in Figure 5.2 (bottom panel) was significant (see Appendix F.4.2).

A second model was fitted to test for the effect of dominance on the rate of modification in bilingual children. The model included Dominance (continuous) and Condition (2 levels: 'ISQ' vs 'RhQ') as IVs, with an interaction between the two. Participant and Item were set as random intercepts. The interaction was significant ($\chi^2(1) = 15.6, p < .001$), indicating that dominance had no effect on ISQs ($\beta = -0.01, SE = 0.01, t = -0.95, p = .344$) but it negatively predicted the rate of modification in RhQs ($\beta = -0.01, SE = 0.01, t = -3.04, p = .003$), such that children who were more German dominant modified RhQs less than children whose Italian was relatively stronger, as shown in **Figure 17**.

Figure 17. Effect of dominance (exposure) on the estimated mean number of cues per sentence for bilingual children, by age group.



5.5.2 Types of cues

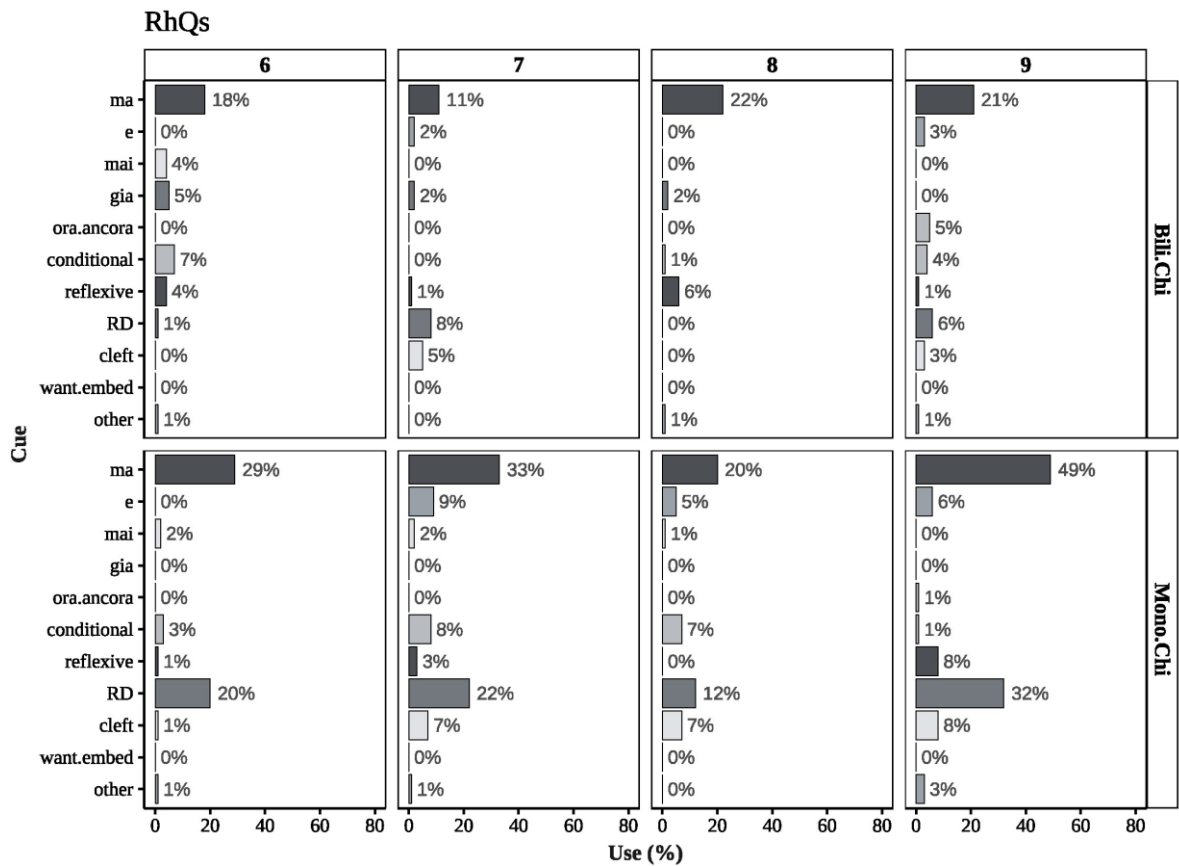
The results examined in the previous section reveal that bilingual children modify RhQs quantitatively less than monolinguals and do not show a significant increase with age. The question then arises which types of cues bilingual children use for RhQ marking, and whether they use the same types as monolingual children (and adults).

Table 13 reports how many sentences were modified by each cue, divided by group and condition. The number in brackets indicates the percentage over the total number of questions in that condition; each number is independent of each other, as one question could be modified by more than one cue. As was evident also from the quantitative analysis, ISQs received hardly any additional modification in either group; therefore, they will not be considered any longer in the qualitative analysis. As to RhQs, the same types of cues ap-

Table 13. Absolute number and percentage of sentences modified by each cue.

Cue	Modified ISQs		Modified RhQs	
	N (% sentences)		N (% sentences)	
	Monolingual	Bilingual	Monolingual	Bilingual
<i>ma</i>	18 (2%)	2 (0%)	325 (32%)	188 (18%)
<i>e</i>	0 (0%)	2 (0%)	50 (5%)	14 (1%)
<i>mai</i>	0 (0%)	0 (0%)	14 (1%)	12 (1%)
<i>già</i>	0 (0%)	0 (0%)	0 (0%)	24 (2%)
<i>ora/ancora</i>	0 (0%)	0 (0%)	2 (0%)	13 (1%)
conditional verb	5 (0%)	0 (0%)	49 (5%)	35 (3%)
affective reflexive	3 (0%)	8 (1%)	28 (3%)	28 (3%)
RD	18 (2%)	5 (0%)	215 (21%)	43 (4%)
cleft	44 (4%)	14 (1%)	56 (6%)	20 (2%)
'want' embedding	0 (0%)	0 (0%)	0 (0%)	0 (0%)
other	8 (1%)	10 (1%)	12 (1%)	8 (1%)

Figure 18. Proportion of modified RhQs for each type of cue. want.embed = embedding under *volere*.

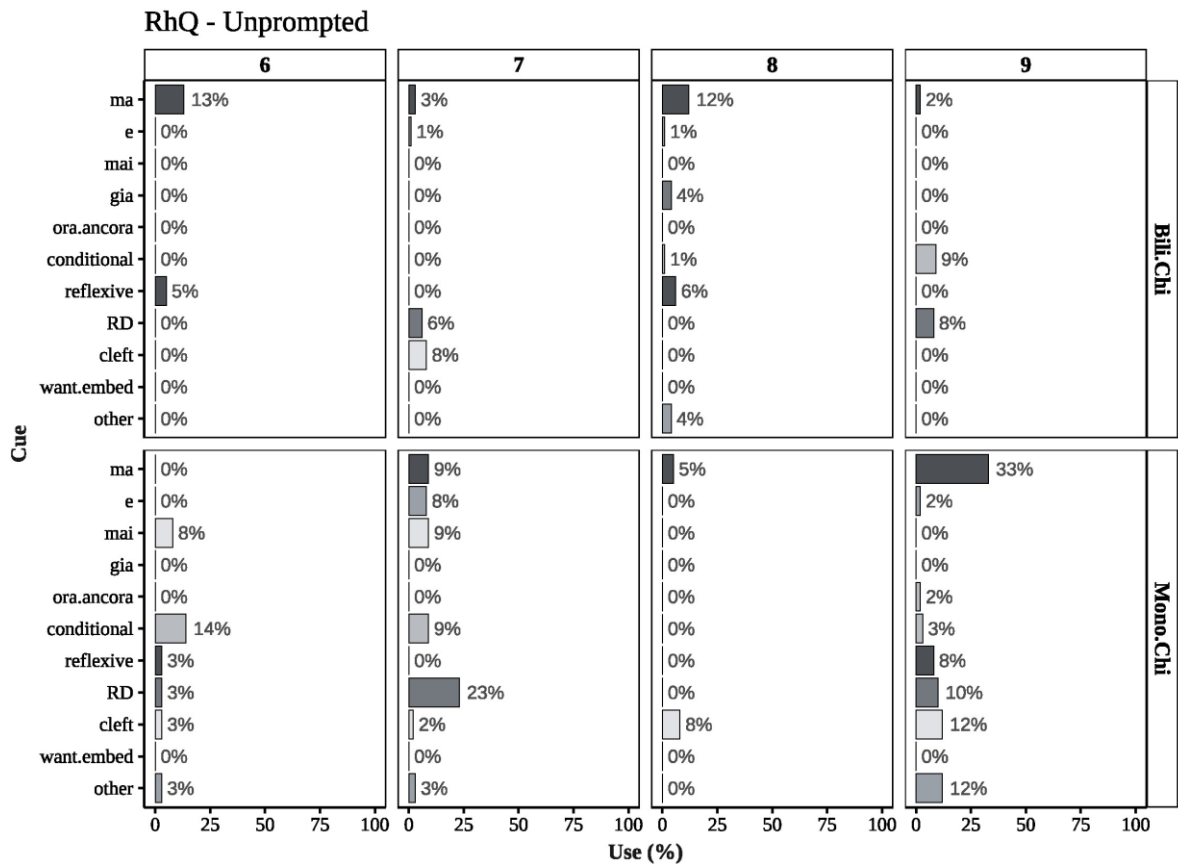


pear in both groups: the particles *ma*, *e*, *mai*, conditional or reflexive verbs, RD, clefts. Three lexical elements (*già* ‘lit: already’, *ora* ‘lit: now’, *ancora* ‘lit. still’) are found in bilingual but not in monolingual children (see below for discussion). No child produced any ‘want’-embedding (see 2.3.4.6 and 4.4.2). In both groups, sentence-initial *ma* was the most frequent cue (32% and 18% sentence respectively). In monolingual children, RD was the second most frequent cue, distinctly more frequent than the remaining ones (21%), which occurred at low frequencies (1-5%), indicating that only a few children made use of them. For bilingual children, RD was within the same range as the other cues (1-4%).

The sharp difference in frequency between *ma* and RD (the latter only for monolinguals), on the one hand, and all other cues, on the other hand, corresponds to the findings of Chapter 4. However, for bilinguals as well as monolinguals, it is necessary to control whether this is a task effect: one of the two model questions was modified by *ma* and RD, thus it is possible that children were primed by the model question. **Figure 19** shows the distribution of cues in the unprompted condition, i.e., for a subset of data which includes only those participants who encountered the unmodified model question first (i.e., model question (iii) in **Table 12** above), and only the RhQs elicited in that context. This amounts to about 1/4 of total RhQs, that were elicited when the participant had not heard the modified model question yet. In this context, any additional cue would have been produced spontaneously. **Figure 19** reveals a difference between monolingual 9-year-olds and all other groups. While the former used *ma* as their most frequent cue, even when not prompted with it, the latter did not do so consistently; in particular, 9-year-old bilinguals showed a much sparser use of additional cues and no use of *ma* at all.

One last observation is that bilingual children use a lexical element to mark RhQs that is not found in monolingual productions: *già*, as in (89). In Italian, *già* is a temporal adverb meaning ‘already’. This element is used by five bilingual children (two 6-year-olds, two 7-year-olds, one 8-year-old). *Già* is the direct translation of the German temporal adverb *schon*, which is a strong marker of rhetoricity when used as a discourse particle. In Italian, its use in (89) is inappropriate in this context, because the temporal reading is not available.

- (89) *Chi mangia già le banane?!*
 who eats already the bananas
 “Who already eats bananas?”

Figure 19. Proportion of modified RhQs, by type of cue, when model question contained *ma* and RD.

Another difference from the monolingual productions is the presence in one 9-year-old of the temporal adverb *ora* ‘now’ (90a), sometimes combined with the adverb *ancora* ‘still’ (90b). The evidence for a translation from German is less straightforward in this case. While both the German counterparts (*nun* and *noch*) can in principle be used as modal particles in other contexts, several native informants have noted that the translated counterpart would not sound natural in German in this type of RhQ.

- (90) a. *Chi vuole ora il violino?*
 who wants now the violin
- b. *Chi suona ora ancora il violino?*
 who plays now still the violin
- “Who plays the violin?!”

5.6 Discussion

5.6.1 Optional modification of RhQs

I investigated at what age Italian-German bilingual children use optional pragmatic cues to mark RhQs (RQ1), whether they differ from bilingual children (RQ2), and whether proficiency and dominance play a role (RQ3). Both groups of children were found to use a variety of cues to mark RhQs: the particles *ma* ‘but’, *e* ‘and’, and *mai* ‘ever’, conditional morphology, affective reflexives, RD and clefts. Only bilingual children used the particle *già* ‘already’ (and, in one case, *ora* ‘now’ and *ancora* ‘still’). Thus, children of both groups used appropriate cues for the type of RhQ that was elicited (the case of *già* will be discussed below). These findings indicate that the use of such cues is already available to children from 6 years of age onwards, and that, when present, they are used in a pragmatically appropriate way. This was not unexpected, considering that age 6 was found to be an important cut-off point in the development of children’s pragmatic abilities (e.g., Siegal, Iozzi, and Surian 2009; Siegal et al. 2010), also in connection with language (e.g., Foppolo, Guasti, and Chierchia 2012). This is not to say that *all* children have already acquired this phenomenon. Rather, I have provided evidence that *at least some* children are able to use the cues at this age. Meanwhile, the absence of markers at the individual level cannot be interpreted as non-acquisition because the markers are optional. Nevertheless, we can draw inferences by looking at patterns at the group level.

In quantitative terms, bilingual and monolingual children used the same number (tokens) of cues at age 6, but the older groups differed: the rate of cues increased for monolingual 7- and 9-year-olds, but not for bilinguals. In qualitative terms, children’s behaviour partially depended on having heard a modified sentence before their own productions (e.g., *Ma chi le mangia, le banane?*). In the unprompted condition, both groups used all types of cues, showing that some children could produce them completely spontaneously. However, in this condition, the bilingual group did not use much modification at all (**Figure 19**). Additionally, in neither group was *ma* ‘but’ the most frequent cue, if children were not primed by the model sentence, but both groups used it if they were primed. This indicates that *ma* belongs to their linguistic repertoire. The only exception were monolingual 9-year-olds, who were adult-like both in qualitative and quantitative terms, as seen in Chapter 4. This was not true for bilingual children instead.

Taken together, the quantitative and qualitative patterns of RhQ marking show that the expression of RhQs is developing between the ages of 6 and 9 years in monolinguals, but not in bilingual children. These results tie in with Tsimpli's (2014) predictions for very late acquired phenomena, confirming that the timing of acquisition of a certain phenomenon matters for the outcome of bilingual acquisition (see also Schulz and Grimm 2019). Such phenomena are predicted to be more sensitive to changes in language experience. Thus, to better understand the nature of the difference between monolingual and bilingual children, we looked at external measures of language proficiency (for both groups) and of dominance (for bilinguals specifically).

5.6.2 Effects of proficiency and language dominance

First, the effect of Italian vocabulary size and speech rate was determined for both groups. For bilinguals, there was a noticeable effect of vocabulary: children with a wider vocabulary in their HL used substantially more cues than children with a smaller vocabulary. In other words, children with smaller vocabularies are also more likely to lack knowledge of the individual cues. This could play out in different ways. One possibility is that children have never (or seldomly) heard the relevant cue because they do not have enough language experience. This is very unlikely, since the lexical elements are highly frequent in other contexts, where they appear as conjunctions (*ma* 'but', *e* 'and') or adverbs (*mai* 'ever/never'), express verbal properties (conditional mood, reflexive), or encode discourse management (RD). Alternatively, children may lack knowledge of their specific pragmatic use in the given context³⁷. For example, children may know *mai* as a temporal adverb, but they may not be aware that it can be used to express extreme ignorance in questions, which can lead to a rhetorical interpretation (2.3.4.2). The last possibility is that children do have the relevant lexical/syntactic knowledge but avoid using the cues because of processing costs in integrating the lexical, syntactic, and pragmatic requirements to use them appropriately. While the effect of vocabulary knowledge on cue frequency speaks in favour of the representational account, the facilitative effect of the prompting condition may indicate that priming of some cues alleviated processing costs in production. In fact, the two

³⁷ In some accounts, a different pragmatic interpretation is also associated with a different syntactic derivation, e.g., Giorgi and Dal Farra (2018) for *ma* 'but'; Bayer and Obenauer (2011) for *schon* 'already'. If this is the case, then syntactic and pragmatic integration would also play a role in children's ability to use these cues in context.

accounts need not be mutually exclusive, but may apply differently to individual children, based on their level of proficiency and/or experience with Italian.

The effect of speech rate was not as clear as that of vocabulary: while speech rate did account for some of the variance in the model, its effect was not significant within the groups. Thus, vocabulary was a more appropriate proxy for the phenomenon at hand. The explanation for this might be that speech rate is primarily a matter of how much experience children have in actively using the language, independently of the quality of language use, while vocabulary depends on quantitative *and* qualitative language experience. Bilingual children further showed a robust effect of language dominance: the stronger their German compared to Italian, the fewer cues they used.

Taken together, these findings indicate that bilingual children do not have a bilingual advantage in the acquisition of the appropriate patterns of modification in the HL. If anything, there is evidence of deceleration: while monolingual children gradually become more adult-like with increasing age, bilingual children do not follow the same path. For bilingual children, the crucial contributing factor does not appear to be age, but relative proficiency and language experience with Italian. In this age span, children are increasingly exposed to the ML, both in educational and social contexts, thus receiving a higher amount and a greater diversity of input in their ML. The results strongly indicate that children can only acquire and exploit the fine patterns of pragmatic expression through linguistic means if they are sufficiently exposed to their HL, Italian, in quantitatively and qualitatively rich contexts.

Finally, some bilingual children used the temporal adverb *già* 'already' in Italian RhQs. While its use in (80) is not appropriate in Italian, Italian-German bilinguals might produce such structures as a result of transfer from the majority to the HL: *già* is the direct translation of the German temporal adverb *schon*, which is a strong marker of rhetoricity when used as a discourse particle (e.g., Biezma and Rawlins 2017). Apart from the lexical equivalence, two arguments speak in favour of its interpretation as transfer. First, all five children who used *già* in Italian used *schon* in the German Production task to modify RhQs. Second, all five children had a dominance score above the mean of their age group, ranging between 0.1 and 1.8 standard deviations above it, indicating that their German was stronger than their Italian. In sum, I found evidence for both deceleration and transfer.

5.6.3 Implications for the acquisition of pragmatics

In section 5.3, I outlined two possible opposing scenarios for bilingual acquisition, based on the two strands of research on the acquisition of pragmatics: acceleration (suggesting a bilingual advantage in pragmatic competence) and deceleration (suggesting very late acquisition of interface phenomena). In terms of overt linguistic marking, the data indicates a tendency towards deceleration, mediated by proficiency and dominance, as discussed above. However, this does not exclude the possibility of acceleration, or of no difference from monolinguals at the purely pragmatic level in the acquisition of RhQs: the acquisition of RhQs as a pragmatic category and of their overt language-specific marking may not go hand in hand.

Whether or not the children in our study have acquired RhQs as a pragmatic category is not easy to determine with the data at hand. When children do use overt pragmatic markers, we can infer that they are able to mark a certain attitude or epistemic stance in a question. For example, several children (three monolinguals, one bilingual) combine *mai* with a conditional verb. This combination is ambiguous between a rhetorical and a Cfv-question (Coniglio 2008); while it indicates that at least some children *can* express either one of these two pragmatic readings in a question, it is not obvious whether children interpret it as one or the other. A stronger indication that some children produce questions as rhetorical comes from questions that are modified by more than one cue. While each single cue is ambiguous, the combination of several cues strengthens the rhetorical interpretation. For example, a monolingual 7-year-old combined sentence-initial *e*, an affective reflexive, and a conditional verb in (91). Three was the maximum number of cues that children, especially 9-year-olds, produced in their questions; only one of these utterances was produced by a bilingual child.

- (91) *E chi si mangerebbe il budino?! [7-year-old]*
 and who REFL eat.COND.3SG the pudding
 ‘Who would eat the pudding?!’

The presence of *già* ‘schon’ in bilingual productions brings additional evidence for the acquisition of RhQs as a pragmatic category: Given that the German counterpart is a strong rhetorical marker, its use seems to indicate that children wanted to mark RhQs explicitly and, lacking the means to do so with the HL, they transferred a strategy from the ML. The

presence of *ora* ‘now’ and *ancora* ‘already’ may be interpreted in a similar vein: although the use of these particular markers in this context is inappropriate in either language, the child knows that RhQs require some overt marking. To this aim, she accommodated a “German” strategy (using temporal adverbs as discourse particles) to Italian. Importantly, direct transfer (*già*) from German or the “indirect accommodation” (*ora*, *ancora*) suggests that, for the children who use it, the relevant pragmatic interpretation is already in place. In this respect, we see a facilitative effect of the ML on the expression of a certain function in the HL, an effect that has been previously discussed in the acquisition of syntax as *bilingual bootstrapping* (see also Bernardini and Schlyter 2004; Gawlitzek-Maiwald and Tracy 1996).

In summary, what do these data tell us on the acquisition of pragmatics? For the production of optional pragmatic markers, the bilingual data show deceleration and the possibility of developing a different path (as shown by the instances of transfer and deceleration). Importantly, the acquisition of RhQ marking depends on the amount of input and proficiency in the HL, thus placing it among the very late acquired interface phenomena (Tsimpli 2014). This result is partially in contrast with what we know about other pragmatic phenomena, such as the acquisition of irony and of conversational competence. The contrast can be explained by the fact that we have investigated the *linguistic expression of* a pragmatic phenomenon, not just at the development of pragmatic ability itself. Our results do not exclude the possibility that bilingual children learn that a question can be rhetorical on par with monolingual children, or even earlier. What is more, although RhQs are often investigated together with different forms of irony (e.g., sarcasm), as they are both non-literal forms of language, there is a difference: sarcasm and figurative language pertain to the dimension of meaning only, as they present a discrepancy between the proposition and the state of the world. RhQs, in contrast, present a mismatch between the clause type (interrogative) and its communicative function (normally information-seeking, but not when the question is rhetorical). Thus, the potential parallels in the acquisition of RhQs and other pragmatic and communicative phenomena should be subject of further investigation.

5.7 Conclusion

Monolingual and bilingual children acquiring Italian aged 6-9 years use a variety of cues to mark RhQs, including particles, conditional morphology, affective reflexives and RD, and they use them in a pragmatically appropriate way. While younger bilingual and

monolingual children use a similar number of cues, we found differences amongst the older children, suggesting that the expression of RhQs may not develop in all bilingual children as a function of age, but as a function of proficiency. These results are in line with Tsimpli's (2014) predictions for very late acquired phenomena, confirming that the timing of acquisition of a certain phenomenon matters for the outcome of bilingual acquisition. Unlike for some other communicative, pragmatic phenomena, the bilingual children do not have a bilingual advantage. Instead, vocabulary knowledge and language experience determined the degree to which bilingual children displayed the patterns typical for age-matched monolinguals or a deceleration and (in some cases) different acquisition paths via transfer.

Chapter 6. GENERAL DISCUSSION

6.1 Rhetorical questions and their marking in Italian

With this dissertation, I set out to explore the features of RhQ marking in Italian, the developmental path of this phenomenon and the distinct features of monolingual and bilingual language acquisition in relation to it.

In Chapter 2, I discussed the results of a first elicitation experiment with the double objective of describing the quantitative aspects of RhQ modification in Italian and of outlining a qualitative analysis of the resulting cues. I elicited the production of RhQs and other types of non-canonical questions in 89 native Italian speakers with a diverse regional background. This first step was necessary to provide a baseline for the acquisitional line of research: although several studies had previously analysed or mentioned the presence of certain cues in RhQs (e.g., Coniglio 2008; Fava 1994; Hinterhölzl and Munaro 2021; Obenauer and Poletto 2000), a clear picture of their distribution and frequency was still missing, as well as of the relationship between the frequency of a cue and its “rhetorical strength” (i.e., how strongly it cues a rhetorical meaning), which is not a direct one.

Since the type of marking is predicted to vary in relation to the context in which an RhQ is uttered (Neitsch 2019), I restricted the investigation to the type of RhQ that is most commonly investigated in experimental work: a negative-answer wh-RhQ uttered as a negative reaction to the context, carrying an attitude of criticism. The results of this first elicitation experiment showed that in this context participants frequently used the sentence-initial particle *ma* ‘but’, clitic right dislocation (RD) and cleft questions. The pattern for the first two was replicated in the Production task reported in Chapter 4, which elicited RhQs in a similar type of context but with a different methodology. Instead, clefts were not as frequent in the Production task and were not more frequent in RhQs than in ISQs. For this reason, together with their uncertain analysis, I will not discuss them further.

The high frequency of *ma* and RD vis-à-vis their semantic/pragmatic contribution is a first example of the non-correspondence between frequency and rhetorical strength. *Ma* is essentially a marker of negative bias, and as such it can help cue the rhetorical reading, but it is not sufficient on its own: It is compatible with an ISQ that expresses the speaker’s surprise or disapproval, among others (Giorgi and Dal Farra 2019; Ippolito 2021; Hinterhölzl and Munaro 2021). For this reason, its frequency in the elicited RhQs likely reflect the frequency of occurrence in *all* questions that express this type of attitude. This is not to say that *ma* is independent from the rhetoricity of the question when the question is indeed rhetorical: its presence signals that the speaker is not asking a neutral (canonical)

question, but is expressing an attitude or bias. On this bias, the speaker and the hearer, in producing and comprehending the question respectively, can build the rhetorical interpretation, through the combination with other lexical-syntactic, prosodic and gestural cues and the context. RD, on the contrary, in spite of its frequency, is a very weak cue. Its frequency is likely determined by the discourse status of the RhQ, but its presence on its own cannot determine whether the question is even canonical or non-canonical.

In both tasks, participants produced a variety of other cues, which occurred at lower frequency, all below 10%. This indicates that only some participants used them. A few were produced in the exploratory study (Chapter 2) and not in the Production task (Chapter 4)³⁸, but the pattern was overall the same: the low frequency cues common to both tasks were sentence initial *e* ‘and’, the adverbial particle *mai* ‘ever/never’, the affective reflexive, a conditional verb and formulaic embedding under *volere* ‘want’ (want-embedding). Once again, a correlation between frequency and rhetorical strength is absent. Among the low-frequency cues there are some ambiguous ones, such as *e*, the conditional and the reflexive, which are all compatible with an ISQ reading as well, as well as very strong cues, such as *mai* (in combination with a conditional or in the *wh*-position) and want-embedding. Want-embedding is the strongest cue, as it is unambiguously rhetorical.

Each cue has its own semantic/pragmatic import, and each has a different relation to the rhetoricity of the question, contributing to the rhetorical interpretation more or less directly through the expression of epistemic relations between speaker and addressee, speaker attitude, or relation with the previous discourse. All cues are optional, and the variability in the results indicates that each speaker can choose which type of attitude to express in order to signal that the question is rhetorical.

This result confirms that negative-answer RhQs can be ambiguous with other types of non-canonical questions. In particular, the type that we considered proved to be contiguous

³⁸ In particular, the aggressively-non-D-linked expressions and the more “interactional” cues, i.e., the embedding under *think* and *believe*, the expression *secondo te* ‘in your opinion’ and the interjections like *ma dai* ‘come on’. This discrepancy is likely due to the differences in the elicitation method. In the exploratory study, participants were given contexts and were instructed to react as naturally and colloquially and possible, including the explicit permission to use swearwords, while the Production Task was slightly more performative and had a more rigid structure; besides, it was carried out in presence of the experimenter, while the utterances in the first experiment were recorded privately by participants. Such differences likely discouraged the use of swearwords and of the cues which perform a call on the addressee.

with surprise-disapproval questions (a type of negative biased questions) and Cfv-questions (Celle, Jugnet, and Lansari 2021; Hinterhölzl and Munaro 2021; Ippolito 2021), such that their form can sometimes overlap, and the correct interpretation can be retrieved only by contextual information, or remain unspecified (see also Goto 2018; Neitsch 2019). Nonetheless, I argued that this ambiguity is only present for negative-answer RhQs; in particular, for those RhQs that are derived from the expression of negative bias or unanswerability with their corresponding cues. I suggest that the ambiguity is not accidental, but it depends on the way in which the rhetorical reading is derived: The rhetorical reading is not an alternative to the expression of bias or unanswerability, but it is built on it. Let us take *mai* as an example. *Mai* is used either for a Cfv-question or for a RhQ. The immediate pragmatic effect of *mai* is to signal that the speaker views the question as unanswerable. If the goal of the speaker is to signal the unanswerability of the question itself, i.e., to communicate the fact that they are unable to find an appropriate answer, the question will have the function of a Cfv-question. Instead, the speaker may add an additional piece and convey that the unanswerability of the question is the obvious interpretation on which both speaker and addressee should agree. This way, the derivation of a RhQ with a presupposed negative answer is built by making the point that the answer cannot exist, thus deriving the implicature that the answer is “There is no X such that p” (cfr. Farkas 2023). Notice that, when this is the case, the implied answer is recoverable from the question itself. Positive-answer RhQs cannot be built this way: they can only presuppose an existing entity to fill the variable opened by the *wh*-constituent, which can only be recovered from the context. Positive-answer RhQs are still uttered in reaction to the context, thus some attitude-expressing cues or the “direct” marker of rhetoricity (e.g., *want*-embedding) can also be present in them, but they are incompatible with the cues that express a negative bias or unanswerability.

The results of the exploratory analysis in Chapter 2 sets an important foundation for the investigation of this phenomenon in language acquisition. The essential elements of the picture outlined by the adult data for our type of negative-answer RhQs are i) the *multiplicity* and ii) the *optionality* of cues; iii) the *ambiguity* and underspecification with respect to other types of non-canonical questions, which are information-seeking to different degrees.

The availability of a *multiplicity* of cues means that children, like adults, can choose between different options in the way they formulate the RhQ. It also means that they may acquire each cue at different times, based on at least two factors. The first is the “difficulty”

of the element itself. For example, *mai* needs first to be acquired as a temporal adverb (lexical acquisition), together with its semantic and syntactic features as an NPI; want-embedding requires the acquisition of embedding itself and the use of subjunctive morphology in subordination; RD requires the acquisition of clitic pronouns and of left-peripheral syntax and semantics. The second factor is the presence of the specific cue in the input with the desired pragmatic interpretation: For instance, how often is *mai* used in its proper temporal use and how often is it used with its additional pragmatic functions?

The issue of input ties in also with the *optionality* of the cues. Optionality means that adults and children alike can choose which cue(s) to use, based on the type of attitude that they want to convey. Multiple options are available even within the same context. This could also reflect in the input: a child may be more or less exposed to the cues based on how often their caregivers use RhQs in general and on which types of cues they use frequently. As children get older and enter the age span of our interest, the experience of monolingual and bilingual children likely changes in crucially different ways: as they enter formal instruction, monolingual children will be exposed to an always greater variability of input, styles, varieties and genres. Bilingual children's corresponding variation in the input is likely more varied, and will depend on whether they continue being exposed to Italian consistently, whether they receive formal instruction in the HL (and how much), etc. Thus, bilingual children's input may remain stable in quantity and increase in variety, or remain completely stable, or be further reduced in favour of the ML.

Optionality also makes RhQ marking challenging to investigate, because it is not obvious what it means when a child does *not* use a certain cue: they may not have learned it yet at all, not be able to use it with the appropriate pragmatic function and thus avoid it, or they may not use it for the same reason that an adult would not use it, i.e. in the same context of optionality. The same is true for the case in which a child does not use *any* cue: is it because they don't know how to mark a rhetorical question in any way, or simply because they are choosing to rely on prosody and context? To obviate this problem, I conducted a quantitative analysis at the group level, which proved effective: given that the results for adults largely replicated in the two tasks (the exploratory task and the Production task), it is reasonable to assume that the rate of use in a certain group in the same context is revealing of underlying trends. Thus, although we cannot make inferences about non-use in a single child, the quantitative patterns at the group level were adequate in showing a developmental pattern.

The problem of *ambiguity* between types of non-canonical questions poses yet another challenge because, if the cues are ambiguous between different question functions, it is not obvious whether a speaker interprets the question in either sense when they show to produce or comprehend a certain cue or a combination of cues. In the next section, I discuss the results of the language acquisition experiments.

6.2 The development of RhQ marking in monolingual acquisition

The acquisition of RhQ marking was investigated through two main experiments, a Comprehension and a Production task. The experiments were administered to children of 6 to 9 years of age, an age span in which complex phenomena at the interface between language, discourse and language-external domains are expected to develop.

The Comprehension and Production tasks gave insights into two different dimensions. Firstly, in what they targeted: the Production task tapped into the spontaneous production of cues, with a bias for the cues prompted by the model question, whereas the Comprehension task addressed the ability to recognise different question forms (i.e., questions with different sets of cues) and map them to different question functions. The cues used in the Comprehension task were only partially overlapping with those produced in the Production task: Only *ma* and RD were present, alongside with prosody, which instead was not investigated in production.

The two tasks also partially differed in the results they yielded. The Comprehension task showed that almost all children could tell apart two different types of questions when *ma* and prosody were combined in setting the two question types apart. There was an age improvement, with 9-year-olds being significantly more accurate than 6- and 7-year-olds, but most children were at ceiling or almost at ceiling when the two question types were combined. The interpretation of this result must be taken conservatively: it is not possible to determine beyond doubt that children interpreted the questions as rhetorical. We know that *ma* and RD are not exclusively rhetorical, but that they are also compatible with other types of non-canonical questions, in particular surprise-disapproval and Cfv-questions. These types of questions are in principle compatible with the context, and the distinction between Cfv and rhetorical questions is particularly subtle. The “rhetorical prosody” associated with *ma* in this condition could be argued to disambiguate between the two question types, but this may not be sufficient either. The prosodic opposition is not given by only one element, but by a cluster of prosodic cues: longer duration, pitch range and the

final part of the contour, which is low (L%) in RhQs and rising (LH%) in ISQs. This cluster of cues was sufficient for adult speakers of Italian to discriminate between RhQs and ISQs, but it was not for all children: some of them could discriminate between the two question types based only on prosody, while others could not.

Studies on the prosody of RhQs are still at a preliminary stage for Italian (Soriano 2018; 2019; 2020; Ferin, Sbranna, and Albert forthcoming), such that it is not clear exactly what each cue by itself entails and how strongly rhetorical it is. Let's consider the low final contour L%: this contour is strongly associated with wh-RhQs in production (Soriano 2018; Ferin, Sbranna, and Albert forthcoming) in the sense that above 90% of RhQs have it. However, the reverse is not true: not all wh-questions with a low final contour are rhetorical. Thus, the rhetoricity of a question is a strong predictor of the presence of an L% final contour, but not vice-versa. In addition, much like many lexical-syntactic cues, some prosodic cues are likely markers of emotive attitude, in particular the paralinguistic cues. Thus, it is possible that children were paying attention to only one element of the prosody, such as the longer duration, they interpreted a certain attitudinal element, and they associated it with the character. In this case, this was sufficient to distinguish between the two question types, without necessarily having acquired rhetoricity.

In sum, the Comprehension task revealed that children aged 6 to 9 years are able to recognise some pragmatic markers as markers of attitude or of question function. Almost all children could recognise *ma*, and some children could also interpret (elements of) the prosodic form of the question. In conversation with these results, the Production task offered further insight on the developmental process.

For monolingual children, the Production task showed a development within the investigated age span in the use of markers for non-canonical questions. This developmental pattern was evident at the group level: by looking at the frequency of occurrences of the various cues in the age groups, it appeared that the pattern of elicitation of 9-year-olds, the older group, was the most consistent with adult data. 9-year-olds used a similar amount of cues to modify RhQs; their rate for *ma* and RD was similar and they used the same low-frequency cues as adults, with the exception of want-embedding. The use of *ma* and RD was biased by their presence in one of the model questions, but 9-year-olds still produced them more frequently than other cues without being biased by the modified model question, i.e., in completely spontaneous production. The groups of younger children, 6-, 7-, and 8-year-olds, were less adult-like in the overall rate of modification, but all types of cues were

produced starting from age 6 or 7. Like adults and 9-year-olds, younger children used *ma* and RD most frequently, but only when considering all results together: in the condition in which their use was not prompted by the model question, those cues were used at the same rate as the low-frequency ones.

These results are crucial because they show that the knowledge and appropriate contextual use of these cues is available at least starting from age 6, and that the multiplicity of the input is reflected in children's productions. Children show appropriate use or re-use of *ma* and RD after hearing it in association with the context, and they use of their own accord a number of other contextually appropriate cues: *mai*, conditional, *e*, affective reflexives. These cues are compatible with the context in that they express the appropriate type of attitude: recall that questions in the rhetorical condition were associated with a character who replied to an offer (e.g., "Would you like to eat bananas?") with a question that conveyed their negative attitude towards the proposition and a criticism to the other character for suggesting such a thing. In this context, the use of *ma* underlines the counter-expectational aspect (e.g., the character is surprised that anyone eats bananas); the use of *mai* underlines the unanswerability of the question (e.g., the character finds it impossible that anyone would eat bananas); etc.

These cues remain ambiguous with other types of non-canonical questions, in particular surprise-disapproval and Cfv-questions. In the previous section, I discussed the fact that different cues have different degrees of "rhetorical strength": some, like RD, are strongly ambiguous, while others, like *mai* and the *mai*-conditional combination, are strongly non-canonical. Children produced cues in the whole range, with the exception of the strongly rhetorical want-embedding. The reasons of its absence can be more than one. The first is that the cue was not strongly called for by the type of context and was thus not favoured, as witnessed also by its infrequency in the adult productions. The second is that this construction is more syntactically complex than others, as it involves embedding with subjunctive morphology on the embedded verb, and children may have avoided it or not acquired it yet.

Before I discuss whether a rhetorical interpretation has already been acquired, it is worth stressing that this result is already novel and relevant: through the Production task, I showed that 6-to-9-years-old children are able to produce non-canonical questions and to appropriately mark them with optional cues with a special pragmatic value, expressing aspects of emotive and epistemic attitude, and that the acquisition of this ability is still

ongoing and unstable in the primary school years. This confirms the prediction that RhQ marking is part of the cluster of phenomena acquired later in childhood, also classified as very-late-acquired phenomena by Tsimpli (2014). The goal of this dissertation to investigate the acquisition of the optional pragmatic marking that appears in Italian RhQs thus yielded a significant outcome.

Nevertheless, the results afford us the opportunity to draw some inferences also on the other aspect of RhQ acquisition, i.e., the acquisition of RhQs as a functional class of questions, or, in other words, the knowledge that a question can be rhetorical and the ability to produce or interpret a question as such. As discussed at the beginning of this section, the Comprehension task offers limited insight into this issue: it shows that children can discriminate between canonical ISQs and non-canonical ISQs, but it is not possible to determine their exact interpretation of the question because the cues were bundled together. The results of the Production task are more revealing, in that some children combined different cues, making a rhetorical interpretation more probable. Two examples are repeated in (92-93). The use of *mai* and conditional in (92) by a 6-year-old is particularly interesting (recall that these cues were never prompted). This combination is still ambiguous with a Cfv reading, but it shows that, even if this child has not acquired “rhetoricity” yet, it is very close to it: a Cfv-question shares with a RhQ the absence of a request for an answer to the addressee, because the question is used to state the impossibility of finding an answer to it. In this sense, the child shows the ability to utter an interrogative that is not a request for information. It is thus likely that the child has also acquired RhQs, or that they are close to it. Importantly, this inference can only be drawn for the children who produced this combination of cues: It shows that children at this age *could* know about RhQs, but not that all of them already can.

(92) *Chi mai mangerebbe una banana?!* [6-year-old]

who ever eat-COND.3SG a banana

‘Who would ever eat a banana?!’

(93) *E chi si mangerebbe il budino?!* [7-year-old]

and who REFL eat-COND.3SG the pudding

‘Who would eat the pudding?!’

In the introduction to the thesis, I discussed that one of the questions that should be addressed within research on the acquisition of RhQs is the relationship between acquisition

of RhQ marking and RhQs as a pragmatic category: once we establish the path of acquisition of pragmatic marking and of the communicative aspect, it should be determined which comes first and whether one causes the other. While it is not possible to provide an answer within the limitations of the present work, the present results may offer some speculative insight into the matter, opening an avenue for future investigation. The ambiguity between the subtype of RhQs we have investigated and the other types of non-canonical questions with a negative bias is the reason for the difficulty in determining children's interpretation of the question. In principle, we may have chosen a different type of RhQs, for example, positive-answer RhQs, which I have argued not to present the same ambiguity – and future research should do so. However, the contiguity between such types of non-canonical questions, due to the presence of cues that express negative attitude, negative bias and an epistemic bias against the answerability of the question, could be precisely the path leading to the acquisition of rhetorical meaning. It is possible that children acquire first the single cues and their specific pragmatic contribution, and thus learn that a question can convey elements of attitudinal stance; the rhetorical interpretation could then arise on top. As an example, children may first learn that they can build a question saying 'I find it strange that anyone eats bananas' (e.g., a counter-expectational question with *ma*), and subsequently learn that they can use that to say, heavily paraphrasing, 'I find it weird that anyone eats bananas, it is obvious that no one does and you should know that' (i.e., the same question used with a rhetorical value).

In conclusion, the acquisition of RhQ marking was confirmed to still be under the process of developing in the primary school years by monolingual children; thus, it patterns with phenomena that are very-late-acquired in that they require the development of socio-pragmatic skills and the interpretation of non-literal language and communicative intentions. A note on the comparison between RhQs and other phenomena with these characteristics is in order. RhQs are often compared or grouped with irony, because they share several characteristics: in both cases, the literal meaning and the intended meaning are discrepant; additionally, irony can also be marked by paralinguistic cues indicating the speaker's attitude (e.g., Glenwright et al. 2014). However, it should be noted that the two phenomena also present significant differences. In the case of irony, the discrepancies are at the level of meaning. In a sarcastic utterance, the sarcasm lies in the reversal of the literal meaning, and the use of paralinguistic cues simply signals that such a reversal should be applied. In the case of RhQs, the mismatch goes deeper at the structural level: the mismatch

is between the type of clause, interrogative, and the type of illocution/the communicative function, which is more assertive (e.g., Biezma and Rawlins 2017). As discussed in Section 6.1, the rhetoricity of the question may be not simply signaled by, but built upon the linguistic cues. The difference is also proven by the fact that rhetoricity and sarcasm can stack, causing a double reversal of the literal meaning of the question: in the question in (94), B is using a question whose presupposed answer is ‘No one is corrupted in politics’, but with an ironic reversal, such that the ultimate intended meaning is that it is obvious that politicians are corrupted. Thus, although irony and RhQs share many traits and can be classified together in a wider sense as very-late-acquired phenomena, they are two distinct ones, and their acquisition could happen at different times.

(94) A: Do you think we need stricter laws against political corruption?

B: (ironically) *No, come on, who's corrupted in politics?*

6.3 Monolingual and bilingual acquisition

In the previous section, I have discussed the results in light of monolingual language acquisition, showing that the acquisition of optional pragmatic marking in RhQs is still developing between 6 and 9 years of age, and that at this age children are likely developing or have developed the concept of a RhQ. In this section, I turn to the discussion of the investigated phenomenon in light of bilingual language acquisition.

The comparison between monolingual and bilingual children yielded different results in the Comprehension and the Production task. In the Comprehension task, bilingual children were on par with monolingual children, showing high accuracy in ISQs and in the rhetorical condition (which combined *ma* and rhetorical prosody) and high inter-individual variation in the conditions that relied only on prosody. In the Production task, instead, a divergence emerged in the production of cues and in the developmental pattern. Bilingual children have some knowledge of the functional distinction of ISQs vs other types of questions, like monolingual children do, and they use the same set of cues, such that the multiplicity and optionality of cues is reflected in their productions too. At the same time, the groups showed differences.

The divergence emerges in the course of the investigated age period. At 6 years of age, bilingual children have a comparable rate of modification to monolingual children, but 9-year-olds have a lower rate than their monolingual peers, with all age groups remaining at

the same values. Additionally, bilingual 9-year-olds do not show the same advantage as their monolingual counterparts in the unprompted condition: monolinguals have a similar pattern to adults even in this condition, while bilinguals modify very little if they have not been prompted in the model question. Thus, it appears that monolingual and bilingual children start at a similar level and the difference between the two groups emerges through the primary school years.

Divergences in monolingual and bilingual acquisition can emerge through a variety of factors: quality and quantity of language exposure and use, CLI, different allocation of processing resources (Benmamoun, Montrul, and Polinsky 2013; Meisel 2001; 2004; Polinsky and Scontras 2019; Silva-Corvalán and Treffers-Daller 2015). In the present study, the effect of CLI is certainly found in the form of transfer when bilingual children translate the German rhetorical particle *schon* ‘already’ into Italian *già*. This instance of transfer is found in five participants of 6, 7 or 8 years of age, all of whom used *schon* in their German productions. Additionally, one 9-year-old used some temporal adverbs that in German can be used as discourse particles, although the felicity of their German counterparts in the corresponding context is disputed. These two instances of non-target productions suggest that children are aware of the difference between the two question types and want to mark them, but they intuitively resort to the resources of the ML.

The other type of divergence, i.e., the frequency of use of the target-like cues in the bilingual age groups, need not have a sole explanation. Rather, various factors likely concur in explaining this trend, as I discuss in the remainder of this section. Once again, it should be noticed that non-use by a single child does not imply non-acquisition, nor difficulty of use, because the use of all cues is optional. Nevertheless, the trends at the group level indicate that on average marking is less frequent, implying that lack of acquisition or greater levels of avoidance must be the case for a number of children. The two aforementioned alternatives constitute the two possible explanations for divergent non-use.

Non-acquisition could in principle play out in two ways. The first is that children have not acquired the lexical items or syntactic structures that form the base for the cue. However, this first possibility is unlikely: most elements are very frequent in everyday speech in their base function, as conjunctions (*ma* ‘but’, *e* ‘and’) or adverbs (*mai* ‘ever/never’), verbal morphology (conditional mood, reflexive), or information structure (RD). In fact, the latter is the most likely to be affected, as the acquisition of clitics may present independent difficulties for children acquiring Italian as a HL (e.g., Müller and Hulk

2001); this may explain the low rates of use in bilingual children even when prompted by the model question. For all other cues, the second alternative seems more plausible, namely, that children have acquired the base form and meaning of the lexical item or syntactic structure, but they have not yet acquired the additional pragmatic function³⁹.

In both cases, non-acquisition can be explained by the different quantity and quality of input in bilingual children when compared to monolingual children. For both groups of children, the optionality and multiplicity of the phenomenon predict a certain degree of variability in the use of caregivers. Nevertheless, as they grow older, monolingual children have more exposure to various forms of language outside the family, both in formal and informal contexts, and have thus more opportunities to be exposed to the relevant evidence. In contrast, the quantity and variability in the input of bilinguals is not as inevitable and will depend greatly based on the individual's experience and type of instruction. In any case, immersion in the ML environment will likely restrict their opportunities of sufficient exposure. The hypothesis that part of the variance found in bilingual children is due to differences in the input is confirmed by the effect of exposure that was found in the Production task: the more a child was exposed to German and the less to Italian, the fewer lexical-syntactic cues they tended to use.

The second possibility is that children have acquired the cues and their pragmatic function, in the sense that they have received sufficient exposure to be able to recognize the cue and its pragmatic value, but avoid using it because of the excessive processing costs needed to integrate the lexical, syntactic, and pragmatic aspects. This appears to be the case at least for *ma*: children can use it to distinguish between canonical ISQs and non-canonical questions; the fact that almost all children were able to interpret it consistently in the Comprehension task but did not use it consistently in the Production task suggests an asymmetry between comprehension and production. Additionally, the priming effect of the model question suggests a facilitative effect that may have alleviated processing costs in production.

The two explanations, non-acquisition due to insufficient experience and avoidance due to excessive processing costs in online production, are not mutually exclusive: Not only

³⁹ There is in principle a third possibility, i.e., that the cue has been acquired but has then undergone attrition. If this indeed happens, it is perhaps more likely for older children, although it seems rather unlikely that attrition happened so fast after acquisition. In any case, this eventuality is not visible in the data.

can they be alternatively applied to different children, based on the individual linguistic profiles, but they can also be applied to different cues within the same child. It is possible that a child has received sufficient exposure and has the sufficient linguistic experience to have acquired a subset of cues, but is not confident enough to use them.

Beside the effect of language experience, the Production experiment also yielded an effect of vocabulary productivity, which positively correlated with the rate of modification in bilingual children. There was also an effect of speech rate, which was however less defined. The effect of vocabulary on the rate of RhQ marking in bilingual children can be interpreted in light of both accounts, non-acquisition and processing. Vocabulary diversity can be taken as a proxy for a more general measure of proficiency, which is determined, among other factors, by the amount of language experience. In this sense, VOCD and rate of modification correlate because children with a larger vocabulary are more likely to have acquired also the optional pragmatic markers. However, VOCD is a measure of vocabulary productivity in an oral elicitation setting, which involves the dimension of lexical retrieval in production (Treffers-Daller and Korybski 2015). In this sense, a more efficient use of processing resources in the production of the HL may underlie both the ability to produce a lexically diverse text and the integration of optional pragmatic markers in the production of RhQs.

So far, I have discussed the divergences between monolingual and bilingual children in terms of processes that depend on the specificities of bilingual acquisition. However, divergences can have also external causes. In particular, they can depend not on the bilingual individual but on the linguistic community itself: bilingual children may undergo a differential process of acquisition not only because they receive a reduced input in terms of quantity and variety, or because of influence from the ML, but also because the input itself is qualitatively different. The children's parents, by changing their language community (as first-generation immigrants, the case for the majority of our children), can experience attrition for some language phenomena (as observed for pro-drop, e.g. by Tsimpli et al. 2004). In this scenario, bilingual children would simply be acquiring a slightly different language system than the homeland speakers.

This consideration ties in with the debate on the opportunity of comparing monolingual and bilingual speakers, as I have done throughout this thesis. Comparing bilingual participants to a monolingual baseline is a common practice, but it needs to be taken with caution and awareness of what the comparison can and cannot reveal, as

discussed by Rothman et al. (2023). The use of a monolingual group as a baseline can be useful in an experimental framework when it constitutes a methodological control, but if done blindly and simply as a standard procedure, it presents several risks. A first risk is that of overgeneralising the results afforded by the comparison and drawing premature conclusions, for example by ignoring divergences in the input. In this perspective, an alternative comparison group should be constituted by the individuals who provide the input (in our case, children's parents and the Italian migrant community in Germany) (Polinsky and Scontras 2019; Rothman et al. 2023). A second risk is that of interpreting everything in terms of divergences between the two groups, paying little attention to intra-group variation and thus losing explanatory power on what population-internal factors determine variance within the population itself. Rothman et al. (2023) suggest that one possible alternative is to consider inter-HS variability by regressing the HSs' performance against other predictive variables that bring out and explain individual differences. A third risk is that treating the monolingual comparison as an acritical default may bring with it an implicit judgement on the linguistic attainment of the bilingual, seen as defective whenever divergent; thereby, HSs may be implicitly treated as 'not good enough' speakers of their HL (Kupisch and Rothman 2018).

Rothman et al. (2023) do not claim that a comparison between monolingual and bilingual groups should be given up entirely, but that it should be justified case by case and only employed when backed by appropriate research questions. I maintain that this was the case for the present research. First of all, monolingual children were not simply a comparison group, but they were one of the targets of research. One of the goals of this dissertation was to investigate the acquisition of RhQ marking in Italian in its own right, which had never been investigated before. Establishing the monolingual results as a baseline for the bilingual was a subsequent step. In my view, it was useful and appropriate, because it gave insight into what the process of acquisition looks like when children are exposed to one linguistic system (albeit complex and variable). Against this backdrop, it was possible to determine which acquisition processes are universal to all populations of acquirers and which are specific to the bilingual population. Without an initial notion of what a certain phenomenon looks like in acquisition, it is hard to tease apart the reasons behind a certain set of results. By looking at the productions of bilingual children, it would have been impossible to know whether the observed pattern of optional modification corresponded to

the acquisition of the phenomenon under all conditions, or whether part of the results was due to children's bilingual status, as it appears to be the case.

Thus, a monolingual comparison in this case was necessary and fruitful. Indeed, we should be wary in the interpretation of the observed divergences, avoiding any evaluative comparison between the two populations, and treating them as a comparative analysis of the development of the same phenomenon under two different conditions. Where divergence is observed, the cause cannot be established with certainty simply by this comparison, attributing it solely to reduced input, CLI, online language processing or divergent input in the bilingual community. Herein, I have discussed the possibility that the observed results are due to a co-occurrence of all these factors, with evidence from the correlation with proficiency and experience measures; I showed that these variables did matter in bilingual productions thus focusing the attention on bilingual's internal variability⁴⁰. Teasing apart all of these causes will, of course, require further investigation, for which I outline some suggestions in Chapter 7.

In conclusion, I have shown that 6-to-9-year-old bilingual children have access to the acquisition of the optional pragmatic marking for RhQs in Italian; while they have access to the same range of cues, their ability to appropriately use such cues in production strongly depends on the individual level of exposure to and proficiency in the majority language. Differently from monolingual children, there is less evidence for a development with age. The possibility that such a development occurs likely depends on the child receiving continuous and sufficient input, as is shown also by the effect of dominance in the comprehension task. These results are in line with the claim that phenomena that require the integration of language-internal, pragmatic and general cognitive aspects, such as conversational competence and intention reading, are acquired very late and, for this reason, they are dependent on continual and sufficient exposure to the relevant input also later in childhood (Tsimpli 2014). Thus, children can only acquire and exploit the fine patterns of pragmatic expression through linguistic means if they are sufficiently exposed to their HL, Italian, in quantitatively and qualitatively rich contexts.

⁴⁰ This does not exclude that similar factors also matter in the monolingual population. The effect of vocabulary was only found for bilinguals, but it is possible that other predictors would be more revealing, such as the level of colloquiality in the input or vice versa the level of literacy.

Chapter 7. CONCLUSION

7.1 Conclusion

The goal of the present thesis was to explore the features of RhQ marking in Italian, the developmental path of this phenomenon in monolingual and bilingual acquisition, and the potential divergences between the two modes of acquisition.

I showed that negative-answer wh-RhQs in Italian are marked by a multiplicity of optional cues that are markers of negative bias, emotive attitude, epistemic attitude towards the answer and interaction with the addressee. The “rhetorical strength” of the cues varied and was not correlated with the frequency of the cues. The same cues, with the exception of want-embedding, were confirmed to be ambiguous with other types of non-canonical questions, in particular surprise-disapproval (negative bias) and Cfv-questions. I further argued that the observed distribution of cues was not determined by the rhetoricity of the question itself, but by the type of context and communicative function of the RhQ, and that different contextual conditions would produce a different pattern.

The pattern of optional marking in the same RhQ type was then analyzed in the context of language acquisition, both in a monolingual and in a bilingual setting, focusing on children aged 6 to 9. The experimental challenges posed by the multiplicity and optionality of cues were circumvented by looking at frequency in the rate of production at the group level. Monolingual children showed a developmental effect in the use of optional pragmatic markers: while they used the same types of cues as monolingual adults, with the exception of want-embedding, the rates of modification were lower for younger groups. Additionally, younger children relied more on the prompting of some cues in the model question they heard, while 9-year-olds produced a similar pattern of cues also in the conditions when they could do so completely spontaneously. In comprehension, monolingual children showed that they could consistently differentiate between two different question types (at minimum, canonical and non-canonical) when the lexical-syntactic cue *ma* and rhetorical prosody were combined, while the ability to do so based only on prosody showed great variability within the age groups, indicating that it was not yet completely acquired in the investigated age range. Taken together, the findings indicate that the acquisition of optional pragmatic marking in RhQs is still unstable and under development in the primary school period, and thus patterns with very-late-acquired phenomena at the interface between various intra-linguistic and extra-linguistic dimensions.

Bilingual acquisition showed both similarities to and differences from monolingual acquisition. For bilingual children, Italian was the HL. In comprehension, bilingual children showed the same ability to differentiate between two different question types when relying on a combination of lexical-syntactic and prosodic cues, and the same intra-group variation when relying only on prosody. Divergences were instead found in production: although the same types of cues were found in both groups, bilinguals did not display the same developmental pattern found in monolinguals, as they did not show an increase in the rate of modification with age nor less reliance on prompting by the experimenter. Additionally, positive instances of transfer from the ML German were found in the occasional use of *già*, which translates German *schon*, a strong cue to rhetoricity in German. I argued that divergences between the two groups are attributable to a variety of factors: CLI (as witnessed by cases of transfer), divergences in the quantity and quality of input (proven by the effect of dominance, calculated from language experience) and the level of proficiency in the HL (suggested by the correlation with vocabulary productivity in production). Potential divergences also in the input are possible but remain theoretical at this stage.

7.2 Limitations and future directions

The present research contains some limitations, but also opens future lines of research. As far as RhQ marking was concerned, the goal was to provide a quantitative description of the various cues. A qualitative analysis of the cues was also carried out, but many aspects of their exact semantic and pragmatic contribution to the questions remain to be determined; their interaction with other types of contexts needs to be established, and it is possible that other cues are found in different contexts. Additionally, the results here outlined should be integrated with an analysis of prosodic cues. It should be determined i) which prosodic cues can mark RhQs in Italian, and whether they vary across varieties; ii) how each prosodic cue contributes to the rhetoricity of the question, whether directly or indirectly, along the lines of lexical-syntactic cues; iii) how lexical-syntactic and prosodic cues (but also gestures) interact with each other. Work on this topic is already ongoing (e.g., Ferin, Sbranna, and Albert forthcoming).

In the field of acquisition, the findings of this thesis are novel and groundbreaking, but work on the topic has only just started. The results offered a bird-eye view of the patterns of modification, but various dimensions need to be refined and further investigated. Firstly, a longitudinal study of naturalistic speech is necessary to determine

when these cues appear in spontaneous production and in which contexts, although this goal is challenged by the lack of corpora of Italian monolingual acquisition past the age of 3. Besides, the input that children receive should also be observed: this includes caregivers, but ideally also other types of input that children receive later in childhood, such as child-directed media, literature, and instruction materials, to determine frequencies in the input and potential differences in register. Secondly, each cue should be investigated in greater detail and on its own, combining production and comprehension methods to determine the acquisition of their exact pragmatic function(s), both in relation to and independently from RhQs. Thirdly, the findings should be integrated by the analysis of prosody in the same contexts and its interaction with lexical-syntactic modification. Finally, the acquisition of rhetoricity in its own right should be investigated as well, trying to determine when children start to properly acquire rhetoricity, whether some types are acquired first, and what the relationship between rhetoricity and rhetorical marking is. While I have tried to draw some inferences from the present results, much work still needs to be done.

In terms of bilingual acquisition, several research questions arise. Like for monolingual children, the acquisition of single cues should be scrutinized on its own and investigated longitudinally in spontaneous production. The relationship between rhetoricity and rhetorical marking should also be investigated in this population, addressing the hypothesis that the communicative aspect may be equal or even advantaged in bilingual children. As discussed in Chapter 6, one of the limitations of this study was the lack of information on the phenomenon in the input received by heritage acquirers from their parents. Thus, a comparison with this other baseline is desirable, together with a refinement of the role of external predictors, such as proficiency, experience, and formal instruction. Further insight would be gained by the investigation of the same phenomenon in adult HSs: while I have focused here on the development in a specific age range, adult HSs represent the end state of acquisition, which may show a greater pragmatic competence, or, in contrast, attrition. A final interesting aspect would be the comparison between the HL and ML of the same speakers, looking at the whole linguistic space of these speakers.

In conclusion, notwithstanding its limitations, the findings of this thesis revealed novel and yet unknown trends in the acquisition of RhQ marking in bilingual and monolingual speakers, and paved the way for many future directions in the acquisition of RhQs.

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APPENDICES

Appendix A. Elicitation experiment in Chapter 2: materials and participants

Table A1. Contexts of elicitation – Written translation task

Context and target sentence	Condition	Question type
<p>You are the leader of a youth group and your group is visiting Rome. You would like to know whether the teenagers in the group want to go to a museum or not. You say to them:</p> <p><i>Who wants to go to the museum?</i></p>	ISQ	wh
<p>You would like to offer your guests different kinds of tea, including camomile. You want to know which of them like this tea. You say to your guests:</p> <p><i>Who drinks camomile?</i></p>	ISQ	wh
<p>You would like to treat your friends and give them roses. You want to know who would like some. You say to your friends:</p> <p><i>Who would like roses?</i></p>	ISQ	wh
<p>You want to learn how to dance Lambada and want to know whether one of your friends can teach you or not. You say to your friends:</p> <p><i>Does anyone dance Lambada?</i></p>	ISQ	polar
<p>Your aunt offers limes to her guests. However, everybody knows that this fruit is too sour to eat by itself. You say to your cousin:</p> <p><i>Who eats limes?!</i></p>	RQ	wh
<p>Your friend wants to found a reading circle in which you discuss novels on a weekly basis. However, it is obvious that everyone is too busy for this. You say to your friend:</p> <p><i>Who reads novels?!</i></p>	RQ	wh
<p>A neighbour falsely thinks that you study algebra. However, everybody knows that Maths was always too difficult and complicated for you. You say to your neighbour:</p> <p><i>Who studies algebra?!</i></p>	RQ	wh
<p>On movie night your cousin serves your friends fries and asks whether they would like some mayonnaise. However, everybody knows that none of your friends like this stuff. You say to your cousin:</p> <p><i>Does anyone like mayonnaise?!</i></p>	RQ	polar

Table A2. Contexts of elicitation – Oral elicitation task

Context and target sentence	Condition
RhQ, wh	
Siete in gita con la classe e il prof propone di andare al museo archeologico. Ovviamente tutti la trovano un'idea tremenda, è una bella giornata e volete stare all'aperto. Tu dici al tuo amico: <i>... chi ... museo?!</i>	'You are on a school trip and the teacher suggests going to a museum. Obviously, everybody finds it the most boring idea in the world, it's a nice day and you want to be outside. You tell your friend: <i>... who ... museum?!'</i>
Sei uno studente nel 2019. La prof ha l'idea di farvi imparare una poesia di Pascoli... ma imparare le poesie a memoria è roba da anni Novanta. Sottovoce dici al tuo compagno di banco: <i>... chi ... poesie ...?!</i>	'You're a pupil in 2019. The teacher wants to make you memorize a poem by Pascoli... but learning poetry by heart is stuff from the '90s. You whisper to your deskmate: <i>... who ... poetry ...?!</i>
Matteo sta preparando una cena per la vostra compagnia e vuoi aiutarlo. Ti dice che di secondo vuole fare il fegato... ovviamente, tu sai che non lo mangerà nessuno. Gli dici: <i>... chi ... fegato ...?!</i>	'Matteo is preparing a dinner for your friends, and you want to help him. He says that he wants to prepare liver as the main course... of course, you know that nobody will eat it. You tell him: <i>... who ... liver ...?!</i>
Siete a cena da tuo fratello. Dopo cena pensi che sia il momento di tirare fuori i liquori, e invece lui domanda: Qualcuno vuole una tisana? Gli rispondi: <i>... chi ... tisana ...?!</i>	'You're having dinner at your brother's house. After dinner you think it's time for some spirits, but he asks instead: Who wants a herbal tea? You answer to him: <i>... who ... herbal tea ...?!</i>
RhQ, polar	
Sei all'inaugurazione di una mostra molto importante con il tuo ragazzo. Il tavolo del buffet vi attira, ma quando vi avvicinate vedete che tutti gli antipasti sono al caviale. Disgustata dici al tuo ragazzo: <i>... qualcuno ... caviale?!</i>	'You are at the vernissage of a very important exposition with your boyfriend. The buffet looks interesting, but when you draw near you notice that all the starters are made with caviar. Disgusted, you tell your boyfriend: <i>... someone ... caviar?!'</i>
State chiacchierando fra amici. Giulia non fa che parlare della sua nuova verdura preferita, la pastinàca. I tuoi amici sono perplessi; è chiaro che nessuno sa cos'è. Dici a Giulia: <i>... qualcuno ... pastinàca?!</i>	'You're having a chat with your friends. Giulia keeps talking about her new favourite vegetable, parsnip. Your friends are puzzled; it's clear to you that nobody knows what that is. You tell Giulia: <i>... someone ... parsnip?!'</i>
ISQ, wh	
Stai organizzando una cena per il compleanno di una tua amica e vuoi sapere se gli invitati mangiano la pasta al ragù o no. Chiedi: <i>... chi ... ragù?</i>	'You're organizing a birthday dinner for your friend, and you would like to know if the guests eat Bolognese. You ask: <i>... who ... Bolognese?'</i>
ISQ, polar	
Quest'anno hai raccolto dall'orto di tuo nonno un sacco di broccoli, e devi trovare qualcuno a cui darli. Domandi ai tuoi cugini:	'This year you have harvested a lot of broccolis from your grandad's garden, and you need to find someone to give them to. You ask your cousins:

<i>... qualcuno ... broccoli?</i>	... anyone ... broccoli?’
Vuoi organizzare una gita con i tuoi amici, e vuoi andare in un posto dove non è mai stato nessuno. Chiedi loro:	‘You want to organize a trip with your friends, and you want to go somewhere no one has been to. You ask them:
<i>... qualcuno ... Mantova?</i>	... anyone ... Mantova?’

Surprise-disapproval, wh

Oggi il tuo compagno di banco è venuto a scuola con tre borse. Per dargli una mano prendi il suo zaino, ma senti che pesa un quintale. Gli dici:	‘Today your classmate came to school with three bags. To help him, you take his schoolbag, but it weighs a ton. You tell him:
<i>... hai ... dentro?!</i>	... have ... inside?!’

Conjectural/concern, wh

Sono le dieci di sera. Tuo figlio doveva tornare alle sette ma non è ancora a casa. Preoccupata dici a tuo marito:	‘It’s ten in the evening. Your son should have come home at seven, but he isn’t home yet. Concerned, you tell your husband:
<i>... dove ...?</i>	... where ...?’

Positive answer RhQ, wh

Qualcuno ha rotto una sedia della cucina. Il papà si arrabbia tantissimo e vuole sapere chi è stato. Tu sai che l’unica persona in casa oggi era tua sorella, e che le piace dondolarsi sulle sedie. Con sarcasmo dici:	‘Someone has broken a kitchen chair. Dad is really angry and wants to know who did it. You know that the only person at home today was your sister, and that she likes to rock on chairs. You say sarcastically:
<i>... chi ... stato ...?</i>	... who ... been ...?’

Filler

Stai leggendo il giornale. Alla fine di un articolo molto interessante vuoi sapere chi è l’autore. Ti chiedi:	‘You’re reading the newspaper. At the end of a very interesting article, you want to know who the author is. You ask yourself:
<i>... scritto ...?</i>	... written ...?’
Sei ad un negozio dell’usato con Giorgia. Su un manichino vedete un completo ridicolo: è zebrato e leopardato con cintura rosa. Giorgia si mette a ridere e ti dice: Hai visto quello? Tu rispondi: Non ci credo!	‘You’re at a flea market with Giorgia. You see a leopard-skin and zebra-striped dress with a pink belt and a feather boa on a mannequin. Giorgia starts laughing and tells you: Did you see that? You say:
<i>... chi ... roba ...?!</i>	... who ... stuff ...?!’

Practice

Stai tornando a casa da scuola con tuo fratello. All’improvviso lui allunga la gamba e ti fa lo sgambetto; tu cadi e ti fai male alle ginocchia. Arrabbiato, gli dici:	‘You’re coming home from school with your brother. Suddenly, he sticks out his leg and trips you; you fall and hurt your knees. Furious, you tell him:
<i>... scemo ...?!</i>	... idiot ...?’
Dopo tanti anni, ritrovi un vecchio compagno di classe. Vi baciate e abbracciate e cominciate a chiacchierare. Lui ti dice: Non ne posso più del lavoro, sono troppo stressato. Tu gli chiedi:	‘After many years you meet an old schoolmate. You kiss and hug and start chatting. He says: I can’t take it anymore at work, I’m too stressed. You say:
<i>... lavoro ...?</i>	... job ...?’

Materials A3. Instructions

Introduction

- There are different types of questions. Some questions actually ask for information. For example: *I ask my father: “What’s for dinner?”*. In this case, I really want to know what we are going to eat tonight. This is a **normal question**.
- There are also questions that do not really want an answer, but that are used to comment on a situation. For example, *My engineer friend keeps giving me advice about my health. I tell him: “What do you know about it? Do you have a degree in Medicine?”* In this case, the answer is obvious to both of us: no, my friend does not have a degree in Medicine; I only want to comment on the situation with sarcasm. This type of question is called **rhetorical question**.

Instructions – part I

- In this first task, you will read some everyday situations in English, followed by a question. Your task is to **translate** the question in Italian. If necessary, you can add words or change the structure of the question. This is an example of a normal question:
- *You have cooked dinner for your friends. You tell them that you have prepared soup, steak and a salad with celery. However, you are not sure whether everyone likes celery, so you ask them: “Does anyone like celery?”*
- Here, you can say for example “Qualcuno mangia il sedano?”. There is not one correct solution, you can ask the question as you prefer. It is important that it is as natural as possible. Think about what you would say to a friend or family member, also using words or features of your regional variety (including swearwords – the experiment will remain anonymous!).

Instructions – part II

- In the second part, you will read again about some everyday situations, this time in Italian. You have to ask a **question** using the **given word or words**. This is an example of a normal question:
- [In Italian] *You want to bake a cake, but you are out of milk and eggs. Today you really haven’t got the time to do the shopping, so you ask to you family: **someone shopping ?***
- Your question could be: *Does anyone need to go shopping today? Or Is anyone going shopping today?*
- There is not one correct solution, you can come up with the question you want. The important thing is that (i) it is a question and it contains the given words. The order of

the words can be changed as you like. (ii) It is **as natural as possible**. Think again about what you would say to a friend or relative, also using words or features of your regional variety. Also try to use a spontaneous intonation.

In this part of the test, you will have to record your answer.

Table A4. Participants – detail of region of origin

Area	Region	N participants
Centre	Lazio	5
	Marche	5
	Toscana	4
	Umbria	4
North	Emilia Romagna	1
	Friuli-Venezia Giulia	2
	Liguria	2
	Lombardia	7
	Piemonte	6
	Veneto	15
South	Abruzzo	1
	Basilicata	1
	Calabria	9
	Campania	8
	Puglia	10
	Sardegna	1
	Sicilia	9

Appendix B. Origin of participants of the Perception, Comprehension and Production tasks

Table B1. Monolingual adults – detail of region of origin

Area	Region	N participants
Centre	Marche	1
	Toscana	2
North	Lombardia	6
	Veneto	4
South	Abruzzo	3
	Calabria	2
	Campania	11
	Puglia	6
	Sicilia	7

Table B2. Monolingual children – detail of region of origin

Area	Region	N participants
Centre	Lazio	3
	Marche	2
	Toscana	4
North	Emilia-Romagna	6
	Friuli-Venezia Giulia	2
	Liguria	2
	Lombardia	14
	Piemonte	4
	Trentino-Alto Adige	3
	Veneto	15
South	Campania	6
	Puglia	16
	Sicilia	7

Appendix C. Perception and Comprehension tasks

Table C1. Overview of stimuli used in the Perception (PER) and Comprehension (COM) tasks.

Sentence	Translation	PER	COM
Experimental items			
(Ma) chi (le) mangia le banane?	(But) who eats bananas?	x	x
(Ma) chi (le) mangia le ciliegie?	(But) who eats cherries?	x	x
(Ma) chi (lo) vuole il budino?	(But) who wants pudding?		x
(Ma) chi (lo) suona il violino?	(But) who plays the violin?		x
(Ma) chi (lo) suona il tamburo?	(But) who plays the drums?	x	x
(Ma) chi (lo) legge il giornale?	(But) who reads the newspaper?	x	x
Fillers			
Qualcuno (lo) parla il francese?	Does anyone speak French?	x	x
Qualcuno (li) mette i sandali?	Does anyone wear slippers?	x	x
Qualcuno (li) mangia i piselli?	Does anyone eat peas?	x	
Qualcuno (li) mangia i fagioli?	Does anyone eat beans?	x	x
Qualcuno (lo) vuole il trenino?	Does anyone want a toy train?	x	x
Qualcuno (li) legge i racconti?	Does anyone read short stories?	x	
Qualcuno (lo) mette il maglione?	Does anyone wear jumpers?	x	x
Qualcuno (li) guarda i cartoni?	Does anyone watch cartoons?	x	x
Qualcuno (le) legge le favole?	Does anyone read fairytales?	x	x

Table C2. Instructions to Perception Task

Instructions	Translation
Adesso ti farò ascoltare due frasi alla volta. Tu dovrai dirmi se suonano uguali o se suonano diverse.	Now you will listen to two sentences at a time. You have to tell me whether they sound the same or different.
Facciamo un esempio: [<i>Primo esempio</i> ¹]	Let's hear an example: [<i>First example</i> ¹]
Hai sentito che queste due frasi suonano uguali? Quindi scelgo questo simbolo, (che vuol dire uguali).	Did you hear that? They were the same. So, I choose this symbol, (which means same).
Ti faccio sentire un altro esempio: [<i>Secondo esempio</i> ²]	Let's hear another example: [<i>Second example</i> ²]

Senti? Queste due suonano diverse, quindi scelgo questo simbolo, (che vuol dire diverse).	Did you hear? These two sounded different, so I choose this symbol, (which means different).
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¹ Two declaratives with the same intonation.

² Two string-identical utterances with contrastive intonation: declarative vs polar question.

Table C3. Instructions to Comprehension Task

Instructions	Translation
Ti ricordi dei personaggi dell'altra volta? ¹ Rapunzel faceva sempre delle domande perché voleva scoprire cose nuove. Per esempio, se chiede: "Qualcuno mangia la pizza?" è perché non sa se a qualcuno dei suoi amici piace la pizza, e vorrebbe scoprirlo.	Do you remember the characters from last time? ¹ Rapunzel always asked questions because she wanted to find out something new. For example, if she asks: "Does anyone eat pizza?", it's because she doesn't know if any of her friends like pizza, and she wants to find out.
Certe volte, però, le persone dicono una frase ma intendono tutta un'altra cosa. Per esempio, se dico: "Chi è che mangia i broccoli a colazione?!" Non voglio sapere veramente chi mangia broccoli a colazione, perché so che non lo fa nessuno. I broccoli si mangiano a pranzo o a cena, giusto? Quindi, se dico "Chi è che mangia i broccoli a colazione?!", in realtà voglio dire che nessuno fa questa cosa!	Sometimes, however, people say one thing, but they mean something completely different. For example, if I say: "Who eats broccoli for breakfast?!" I don't really want to know who eats broccoli for breakfast, because I know no one does. You can eat broccoli at lunch or dinner, right? So, if I say: "Who eats broccoli for breakfast!?", what I really mean is, no one does it!
Ti ricordi che Genoveffa usava sempre queste frasi? Per esempio, quando Cenerentola le ha chiesto se legge il giornale, lei le ha risposto così. Per dire che, secondo lei, nessuno legge il giornale, è una cosa sciocca!	Do you remember that Drizella always used this kind of question? For example, when Cinderella asked her if she reads the newspaper, she answered this way. She meant that, in her opinion, no one reads the newspaper, it's a silly thing!
Allora, adesso ti farò ascoltare di nuovo alcune frasi, come prima. Dovrai dirmi se è una frase che direbbe Rapunzel, quindi una domanda	

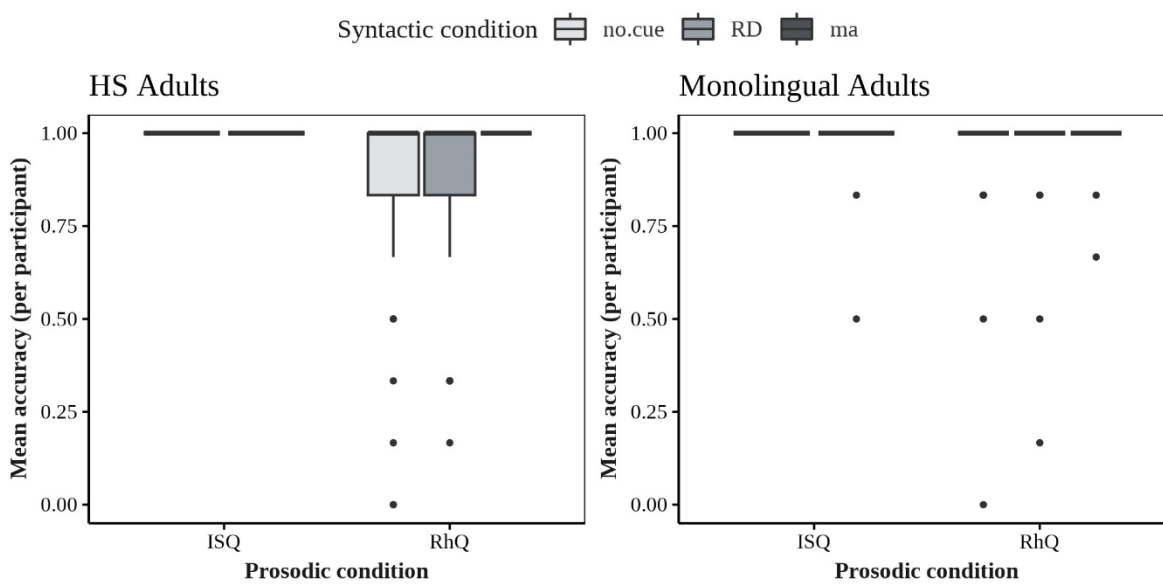
per scoprire qualcosa dai suoi amici, oppure una frase che direbbe Genoveffa, per dire che nessuno farebbe mai quella cosa!²

So now I will play some sentences to you again. You have to tell if it's a sentence that Rapunzel would say, like a question to find out something about her friends, or a sentence that Drizella would say, to say that no one would ever do that!²

¹ Reference to the Production Task, which was carried out in the first session, while the Comprehension Task was carried out in the second session. The two characters were represented on the screen.

² Some parts of the instruction, as written here, present a substantial level of syntactic complexity. In order to ensure that all children received them in a comprehensible form, experimenters were instructed to adapt the complexity of the sentence structure to the perceived level of proficiency of the child.

Figure C4. Results of the Comprehension Task for monolingual adults ($N = 41$) and adult HSs ($N = 40$).



Appendix D. Production task

Table D1. Instructions to Production Task. The order of characters was counter-balanced across children, as shown in Table D2 below.

	Instructions	Translation
Introduction	Adesso vedrai dei personaggi di alcuni cartoni. Forse li conosci già, ma se no non importa, te li presento io. Ogni personaggio ha la sua piccola storia. I personaggi, all'inizio della storia, diranno una frase, e poi toccherà a te dire delle frasi. Il tuo compito è dire delle frasi simili a quelle dei personaggi. Hai capito cosa devi fare?	Now you are going to see some cartoon character. Maybe you already know them, but if you don't, don't worry, I will introduce them to you. Every character has a little story. The characters, at the beginning of the story, will say a sentence, and then it's going to be your turn to say some sentences. Your task is to say similar sentences to the character's one. Did you understand what you've got to do?
Olaf (ISQ)		
Context	Questo è Olaf, forse lo conosci già. Olaf è un pupazzo di neve ed è un tipo allegro e simpatico. Insieme ad Anna, Elsa, Kristof e Sven la renna vive in un castello. Un giorno Olaf sta girando per il castello e trova diverse cose in giro. È molto contento e vuole condividere queste cose con i suoi amici. Okay, allora, Olaf trova un libro di favole e chiede ai suoi amici:	This is Olaf, you might already know him. Olaf is a cheerful and friendly snowman. Together with Anna, Elsa, Kristof and Sven the reindeer, he lives in a castle. One day Olaf is walking around the castle and finds several things around. He is really happy, and he wants to share these things with his friends. Okay, so, Olaf finds a book of fairy tales and asks his friends:
Model question	<i>Chi legge le favole?</i>	<i>Who reads fairytales?</i>
Practice items	Adesso tu sei Olaf e devi fare delle domande simili a quella che ha fatto lui. Proviamo. Olaf ha trovato un maglione e vuole sapere chi mette il maglione. Chiede... [Risposta del partecipante] Olaf ha trovato dei cartoni animati e vuole sapere chi guarda i cartoni. Chiede... [Risposta del partecipante]	Now you are Olaf, and you need to ask similar questions to the one you asked. Let's try. Olaf found a jumper and wants to know who wears jumpers. He asks... [Participant's answer] Now Olaf found some cartoons and wants to know who watches cartoons. He asks... [Participant's answer]

Target items	mangia - ciliegie vuole - budino suona - tamburo suona - violino legge - giornale mangia - banane	eat - cherries want - pudding play - drum play - violin read - newspaper eat - bananas
Rapunzel (ISQ)		
Context	Questa è Rapunzel. Rapunzel è stata rinchiusa per molti anni in una torre, adesso invece è libera e ha ritrovato i suoi genitori. Ha anche dei nuovi amici. Visto che non conosce i suoi amici da tanto, non sa se a loro piacciono le stesse cose che piacciono a lei, e vorrebbe scoprirlo. Per prima cosa, vuole sapere chi di loro mette gli stivali. Domanda:	This is Rapunzel. Rapunzel was locked in a tower for many years. Now she's free and she found her parents again. She also has some new friends. Since she hasn't known them for long, she does not know whether they like the same things that she likes, and she would like to find out. First of all, she would like to know who of them wears boots. She asks:
Model question	<i>Chi li mette, gli stivali?</i>	<i>Who wears boots?</i>
Practice items	Adesso tu sei Rapunzel e devi fare delle domande simili a quella che ha fatto Rapunzel. Okay? Rapunzel vuole sapere chi mette il maglione. Domanda... [Risposta del partecipante] Rapunzel vuole sapere chi guarda i cartoni. Domanda... [Risposta del partecipante]	Now you are Rapunzel, and you need to ask similar questions to the one you heard from Rapunzel. Okay? Rapunzel would like to know who wears a jumper. She asks... [Participant's answer] Rapunzel would like to know who watches cartoons. She asks... [Participant's answer]
Target items	suona - tamburo mangia - banane suona - violino legge - giornale vuole - budino mangia - ciliegie	play - drum eat - bananas play - violin read - newspaper want - pudding eat - cherries
Grumpy (RhQ)		
Context	Questo è Brontolo, uno dei sette nani di Biancaneve. Brontolo è sempre un gran brontolone e non gli piace mai quello che fanno i suoi amici. Quando Biancaneve gli domanda qualcosa, lui lo trova noioso e risponde sempre in modo antipatico. Per esempio, se Biancaneve gli domanda: "Ti piacciono le zucchine?" Lui risponde sempre così:	This is Grumpy, one of Snow White's Seven Dwarfs. Grumpy is always very grumpy, and he never likes what his friends do. Whenever Snow White asks him something, he finds it boring and always replies in an unfriendly way. For example, if Snow White asks him: "Do you like zucchini?", he always replies like this:
Model question	<i>Chi mangia le zucchine?!</i>	<i>Who eats zucchini?!</i>

Practice items	Adesso tu sei Brontolo e quando Biancaneve ti domanda qualcosa devi rispondere in modo antipatico, usando una frase simile a quella che hai sentito. Sei pronto? Biancaneve vuole sapere se Brontolo mette il maglione. Lui risponde... [Risposta del partecipante] Biancaneve vuole sapere se Brontolo guarda i cartoni. Lui risponde... [Risposta del partecipante]	Now you are Grumpy, and when Snow White asks you something, you have to reply in this unfriendly way, using a similar sentence to the one you just heard. Are you ready? Snow White wants to know whether Grumpy wears jumpers. He replies... [Participant's answer] Snow White wants to know whether Grumpy watches cartoons. He replies... [Participant's answer]
Target items	mangia - ciliegie suona - tamburo vuole - budino mangia - banane suona - violino legge - giornale	eat - cherries play - drum want - pudding eat - bananas play - violin read - newspaper
Drizella (RhQ)		
Context	Questa è Genoveffa. È una delle sorellastre cattive di Cenerentola, ed è sempre molto antipatica con lei. Cenerentola prova ad essere gentile con Genoveffa, e le chiede sempre delle cose. Ma ogni volta che Cenerentola chiede qualcosa, Genoveffa lo trova stupido e le dà sempre delle rispostacce. Per esempio, quando Cenerentola le chiede: "Vuoi mangiare del melone?", Genoveffa risponde:	This is Drizella. She is one of Cinderella's evil stepsisters and she always very unfriendly with her. Cinderella tries to be nice to Drizella, and she always asks her something. But every time Cinderella asks something, Drizella finds it silly, and she gives her some nasty answers. For example, when Cinderella asks: "Would you like to eat melon?", Drizella replies:
Model question	Ma chi lo mangia, il melone?!	Who eats melon?!
Practice items	Adesso tu sei Genoveffa e quando Cenerentola chiede qualcosa devi dare una risposta sgarbata, usando una frase simile a quella che hai appena sentito. Andiamo. Cenerentola vuole sapere se Genoveffa mette il maglione. Lei risponde... [Risposta del partecipante] Cenerentola vuole sapere se Genoveffa guarda i cartoni. Lei risponde... [Risposta del partecipante]	Now you are Drizella and when Cinderella asks something you need to give an unfriendly reply, using a similar sentence to the one you just heard. Let's go. Cinderella wants to know whether Drizella wears a jumper. She replies... [Participant's answer] Now Cinderella wants to know whether Drizella watches cartoons. She replies... [Participant's answer]

Target items	mangia - banane vuole - budino mangia - ciliegie legge - giornale suona - violino suona - tamburo		eat - bananas want - pudding eat - cherries read - newspaper play - violin play - drum
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Table D2. Details of the model questions.

Character	Model sentence	Syntax	Prosody	Speaker
ISQ				
Olaf	Chi legge le favole? who reads the fairytales 'Who reads fairytales?'	No cue	Sentence dur: 1.22s Pitch range: 198Hz / 16st H + L* LH%	Age: 23 Gender: M Origin: Veneto
Rapunzel	Chi li mette gli stivali? who CL put-on the boots 'Who wears boots?'	RD	Sentence dur: 1.44s Pitch range: 179Hz / 12st H* + L LH%	Age: 24 Gender: F Origin: Veneto
RhQ				
Grumpy	Chi mangia le zucchine? who eats the zucchini 'Who eats zucchini?!'	No cue	Sentence dur: 1.83s Pitch range: 179Hz / 12st H + L* L%	Age: 20 Gender: M Origin: Veneto
Drizella	Ma chi lo mangia il melone? but who CL eats the melon 'Who eats melon?!'	<i>Ma</i> , RD	Sentence dur: 1.99s Pitch range: 129Hz / 9st H + L* L%	Age: 24 Gender: F Origin: Veneto

Table D3. Order of characters in Production Task in the four experimental list.

Version A	Version B	Version C	Version D
Grumpy (RhQ)	Rapunzel (ISQ)	Olaf (ISQ)	Drizella (RhQ)
Rapunzel (ISQ)	Grumpy (RhQ)	Drizella (RhQ)	Olaf (ISQ)
Drizella (RhQ)	Olaf (ISQ)	Rapunzel (ISQ)	Grumpy (RhQ)
Olaf (ISQ)	Drizella (RhQ)	Grumpy (RhQ)	Rapunzel (ISQ)

Appendix E. Irony task

Table F1. Stories of the Irony Task.

Instructions	Translation
I giochi (Ironic criticism)	The toys (Ironic criticism)
<i>In questa storia parliamo di due amici, Tommaso e Paolo.</i>	<i>This is a story about two friends, Tommaso and Paolo.</i>
Tommaso è andato a casa di Paolo a giocare.	Tommaso is at Paolo's place to play with him.
Tommaso vuole fare una costruzione con i Lego, ma Paolo dice: "No, dai, facciamo troppo disordine!"	Tommaso wants to play with Lego, but Paolo says: "No, come on, we'll make too much of a mess!"
Tommaso gli risponde: "Non ti preoccupare, ti aiuto io dopo a mettere a posto".	Tom reassures him: "No worries, I'll help you tidying up afterwards!"
E così giocano con i Lego.	So they play with Lego.
Ma quando è ora di andare a casa, Tommaso non mette a posto niente, e la camera rimane tutta in disordine. Allora Paolo dice a Tommaso:	But when it's time for Tommaso to go home, he doesn't tidy up anything and Paul's room remains a mess. So Paolo says to Tommaso:
"Mi hai aiutato proprio tanto a mettere a posto. Grazie!"	"You've really been a great help with tidying up. Thank you!"
Il regalo (literal compliment)	The birthday present (literal compliment)
<i>In questa storia parliamo di Giulio e Ilaria, che sono fratello e sorella.</i>	<i>This is a story about Giulio and Ilaria, who are brother and sister.</i>
Oggi è il compleanno della sorellina di Ilaria e Giulio, e loro vogliono farle un regalo. Ilaria però deve andare a ginnastica e chiede a Giulio se può prendere lui il regalo. Giulio le risponde: "Va bene, oggi pomeriggio vado a comprarlo."	Today is the birthday of Ilaria and Giulio's little sister, and the two of them want to buy her a present. But Ilaria has to go to sports, so she asks Giulio if he can buy the present.
"Però mi raccomando, prendi qualcosa di carino e che piace a una bambina", gli dice Ilaria.	Giulio replies: "Of course, this afternoon I'll buy her a present."
Giulio gira per tanti negozi, e alla fine decide di comprare una bellissima bambola, proprio quella che la sorellina voleva avere.	Ilaria reminds him: "Please buy something nice for girls!"
	Giulio looks in many shops and finally finds a very pretty doll, exactly the one his little sister wanted to have.
	Back home he shows it to Ilaria. Ilaria says to him:

Quando torna a casa Giulio la mostra a Ilaria, e lei gli dice:

“Hai fatto proprio un regalo carino! Bravo!”

La tenda (ironic criticism)

In questa storia parliamo di Carlo e di suo zio Gianni.

Carlo vuole andare in vacanza in montagna e dice: “Dai, possiamo dormire in tenda!”. Ma lo zio Gianni risponde: “Ma no, non mi piace la tenda! Se si mette a piovere ci bagniamo tutti!” Carlo gli dice: “No no, sono sicuro che il tempo sarà bello e ci divertiremo un sacco! Sarà una gita bellissima!”

Ma quando arrivano in montagna, piove per tutta la settimana, e allora si bagnano, prendono freddo, e Gianni si ammala. Allora Gianni dice a Carlo:

“È stata proprio bella questa gita!”

La casa (literal criticism)

In questa storia ci sono Fabio e Linda, la sua fidanzata.

Fabio e Linda decidono di andare in vacanza insieme. Linda vuole andare in albergo, per non fare fatica. Ma Fabio dice “Ma no, è meglio affittare una casa, così abbiamo più spazio”. “Mmmh non lo so. E se poi la casa è brutta?” fa notare Linda. Fabio le promette che sceglierà una casa bella e comoda.

Quando arrivano, vedono che la casa che hanno affittato è molto vecchia, con le finestre rotte e il tetto che cade a pezzi. Allora Linda dice a Fabio:

“Mamma mia, hai scelto una casa proprio brutta!”

L'uovo di Pasqua (literal compliment)¹

“That is a really nice present! Well done!”

The tent (ironic criticism)

This is a story about Carlo and his uncle Gianni.

Carlo wants to go on holiday on the mountains, and he says to his uncle: “We could sleep in a tent!” But uncle Gianni replies: “Oh no, I don’t like camping. If it’s raining, we are going to be completely wet.”

Carlo replies: “Oh come on, I’m sure that the weather will be nice and we’ll have a lot of fun. It’s going to be a great trip!”

But when they arrive in the mountains, it starts to rain. They both get wet and freeze and Gianni gets a cold. He says to Carlo:

“That was a really nice trip!”

The holiday house (literal criticism)

This is the story of Fabio and his girlfriend Linda.

Fabio and Linda want to go on holiday together. Linda wants to go to a holiday, to have an easier time. But Fabio says “No, it’s better to rent a car, we’ll have more space”.

“Mmmh, I don’t know. What if it’s an ugly house?”, Linda notes. Fabio promises that he will choose a pretty and comfortable house.

When they arrive at the house, they see that it is very old, with the windows broken and the roof in pieces. So Linda says to Fabio:

“Man, you really chose an ugly house!”

The Easter egg (literal compliment)¹

In questa storia parliamo di Niccolò e di sua nonna.

Niccolò chiede alla nonna un regalino per Pasqua. Ma la nonna gli dice: “Ti porto un uovo di Pasqua, e dentro c’è già il regalino.” Niccolò risponde: “Uffa, di solito le sorprese dell’uovo sono brutte. E se poi non mi piace?” “Non ti preoccupare, vedrai che la sorpresa ti piacerà.” Dice la nonna.

A Pasqua, Niccolò apre l’uovo per vedere la sorpresa e trova un bellissimo orologio, proprio quello che desiderava, e si mette a urlare per la felicità.

Allora Niccolò dice alla nonna:

“Mi piace tantissimo la sorpresa!”

This is a story about Niccolò and his granny.

Niccolò asks his granny an Easter present. But granny says: “I’ll bring a chocolate egg, with a present inside.”

Niccolò answers: “Oh no, the surprise in the Easter egg is always bad. What if I don’t like it?”

“Don’t worry, you’ll like the surprise!”, granny says.

At Easter, Niccolò opens the chocolate egg to see the surprise and he finds a beautiful watch, just the one he wished for, and he jumps with joy.

Niccolò tells granny:

“I really like the surprise!”

Il compleanno (ironic criticism)

In questa storia abbiamo due amiche, Alice e Federica.

Alice e Federica hanno deciso di organizzare la loro festa di compleanno insieme. Federica vuole invitare gli amici a casa sua, Alice dice: “Ma no, a casa è noioso. E’ meglio andare in un parco, così si può correre, e fare dei bei giochi!”

Ma Federica insiste, “No no, dai, stiamo a casa, vedrai che ci divertiremo un sacco!” e alla fine organizzano la festa in casa. Ma in casa non c’è proprio niente da fare, e tutti i bambini si annoiano un sacco.

Alla fine della festa, Alice dice a Federica:

“La festa è stata proprio divertente!”

The birthday party (ironic criticism)

This is a story about two friends, Alice and Federica.

This year, Alice and Federica want to celebrate their birthday together. Federica wants to invite their friends to her house. Alice says: “Celebrating at home is super boring. It’s better to go to the park, there we can run around and play great games.”

Federica insists: “Come on, let’s stay at home. That’s going to be fun, you’ll see!”, so they organize the party at home. But at home, there’s nothing the kids can do, and they are totally bored.

At the end of the party Alice tells Federica:

“That was a super fun party!”

I libri (literal criticism)

Qui abbiamo Daniela e Lucia, due maestre.

The books (literal criticism)

Here are Daniela and Lucia, two teachers.

<p>La scuola ha comprato una nuova libreria per la biblioteca, e adesso bisogna mettere a posto i libri, che sono tantissimi e tutti in disordine!</p> <p>Daniela dice a Lucia: “Per favore, comincia tu a mettere via i libri.” E Lucia risponde: “Sì, non ti preoccupare, comincio subito”.</p> <p>Dopo un po’ di tempo, Daniela va a controllare, e vede che Lucia sta parlando al telefono, e non ha neanche iniziato a mettere a posto i libri. Daniela allora dice a Lucia:</p> <p>“Ma guarda che disordine!”</p>	<p>The school bought new books for the school library. Now the library is a big mess and the books have to be tidied up.</p> <p>Daniela asks Lucia: “Please ask tidying up the books.” Lucia replies: “Yes, don’t worry, I’ll do it right now.”</p> <p>Later, Daniela returns and sees that Lucia is on the phone and that she hasn’t even started to put the books on the shelves. Daniela tells to Lucia:</p> <p>“What a mess here!”</p>
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¹ In Italy, for Easter, children receive hollow chocolate eggs containing a surprise gift.

Materials F2. Example of test questions for Irony task.

The questions followed the same schema for each story. Question A targets the understanding of the literal vs non-literal meaning; Question B is an attention check and did not count towards the calculation of the irony score; Question C targets the understanding of the communicative function (compliment vs criticism). Questions A and C were first asked as open questions; if the child did not give a relevant answer or did not understand the question, the question was asked again as a forced choice.

- Example for the first story: *I giochi* ‘The toys’ (see Table F1)
- Question A

“Paolo said to Tommaso: ‘**You’ve really been a great help with tidying up. Thank you!**’ What did Paolo mean?”

If necessary, rephrase as forced choice: “Paolo meant that a) Paolo helped him tidying up; b) Paolo did not help him tidying up”.
- Question B

“How was Paolo’s room when Tommaso left?”

[4 images: target (messy bedroom); competitor (tidy bedroom); two distractors (other rooms)]
- Question C

“Why did Paolo say to Tommaso ‘Thank you for tidying up?’”

If necessary, rephrase as forced choice: “When he said that, Paolo meant to express a) a compliment; b) criticism”.

Appendix F. Statistical models

Statistical models were run with the R functions *lm* and *lmer* for linear (mixed-effects) regression models and *glmer* (with family = “binomial”) for logistic mixed-effects regression models, from the packages *lme4* (Bates et al. 2015) and *lmerTest* (Kuznetsova, Brockhoff, and Christensen 2017). Logistic regression models included an optimizer (control=glmerControl(optimizer = "bobyqa")) to improve model fit. Fixed effects and interactions in the models were tested by means of type III Anovas with the *Anova* function in the *car* package (Fox and Weisberg 2018). Contrasts (for categorical variables and interactions) and trends (for interactions including a continuous variable) were obtained with the *emmeans* and *emtrends* functions respectively, included in the *emmeans* package (Lenth 2023), with Tukey corrections of the p-value for multiple comparisons. Full model selection and further details can be found in the OSF repository <https://osf.io/cxg6v/>.

F.1 Chapter 3 – Perception task

Table F1. Monolingual model

Maximal model	Accuracy ~ Condition*AgeGroup + (1 + Condition Participant) + (1 Noun)			
Final model	Accuracy ~ Condition + AgeGroup + (1 + Condition Participant) + (1 Noun)			
Anova	Predictor	Chisq	df	p.value
	(Intercept)	15.87475	1	0.0000677
	Condition	22.54231	1	0.0000021
	AgeGroup	17.17634	3	0.0006501

Table F2. Monolingual model - contrasts

contrast	estimate	SE	df	z.ratio	p.value
emmeans(pairwise ~ AgeGroup)					
AgeGroup6 - AgeGroup7	-1.1805161	0.4782497	Inf	-2.4684097	0.0649354
AgeGroup6 - AgeGroup8	-1.5525207	0.5055874	Inf	-3.0707267	0.0114733
AgeGroup6 - AgeGroup9	-2.1311839	0.5661800	Inf	-3.7641457	0.0009605
AgeGroup7 - AgeGroup8	0.3720046	0.5179108	Inf	-0.7182792	0.8898695
AgeGroup7 - AgeGroup9	0.9506678	0.5733851	Inf	-1.6579919	0.3461707

AgeGroup8 - AgeGroup9	- 0.5786633	0.5823838	Inf	-0.9936116	0.7530781
emmeans(pairwise ~ Condition)					
different - same	-1.888153	0.3976839	Inf	-4.747875	2.1e-06

Table F3. Bilingual model

Maximal model	Accuracy ~ Condition*AgeGroup + AooGroup + Dominance + (1 + Condition Participant) + (1 Noun)			
Final model	Accuracy ~ Condition + AgeGroup + (1 + Condition Participant) + (1 Noun)			
Anova	Predictor	Chisq	df	p.value
	(Intercept)	27.545025	1	0.0000002
	Condition	6.135747	1	0.0132476
	AgeGroup	10.887188	3	0.0123518

Table F4. Bilingual model - contrasts

contrast	estimate	SE	df	z.ratio	p.value
emmeans(pairwise ~ AgeGroup)					
AgeGroup6 - AgeGroup7	-1.0179725	0.4653933	Inf	-2.1873381	0.1267005
AgeGroup6 - AgeGroup8	-0.8915850	0.4824790	Inf	-1.8479251	0.2509184
AgeGroup6 - AgeGroup9	-1.4777223	0.4739923	Inf	-3.1176081	0.0098591
AgeGroup7 - AgeGroup8	0.1263875	0.5208090	Inf	0.2426754	0.9949787
AgeGroup7 - AgeGroup9	-0.4597498	0.5108860	Inf	-0.8999069	0.8048765
AgeGroup8 - AgeGroup9	-0.5861373	0.5262159	Inf	-1.1138723	0.6809672
emmeans(pairwise ~ Condition)					
different - same	-0.8435281	0.3405382	Inf	-2.477044	0.0132476

F.2 Chapter 3 – Comprehension task

F.2.1 Two-level comparison

In this set of models, the Prosodic cue (ISQ vs RhQ) was crossed with two levels of the Syntactic cue (neutral vs ambiguous).

Table F5. Monolingual model

Maximal model	Accuracy ~ Pros_cue * Syn_cue * AgeGroup + Perception score + Irony score + VOCD_it + Speech rate_it + (1+Pros_cue Participant) + (1 Noun)			
Final model	Accuracy ~ Pros_cue + Perception score + (1+Pros_cue Participant) + (1 Noun)			
Anova	Predictor	Chisq	df	p.value
	(Intercept)	73.29239	1	<0.000001
	Pros_cue	25.28298	1	0.0000005
	diffscore	30.69578	1	<0.000001

Table F6. Monolingual model – summary and contrasts

contrast/term	estimate	SE	df	z.ratio	p.value
summary()					
(Intercept)	4.2073583	0.4914508		8.561097	<0.000001
Pros_cueRhQ	-3.0337598	0.6033469		-5.028218	0.0000005
Perception score	1.1580660	0.2090229		5.540377	<0.000001
emmeans(pairwise ~ Pros_cue)					
ISQ - RhQ	3.03376	0.6033469	Inf	5.028218	0.0000005

Table F7. Bilingual model

Maximal model	Accuracy ~ Pros_cue * Syn_cue * AgeGroup + Perception score + Irony score + VOCD_it + Speech rate_it + Dominance + AoO + (1+Pros_cue Participant) + (1 Noun)			
Final model	Accuracy ~ Pros_cue * Syn_cue * AgeGroup + Perception score + Dominance + (1+Pros_cue Participant) + (1 Noun)			
Anova	Predictor	Chisq	df	p.value
	(Intercept)	28.5665533	1	0.0000001
	Pros_cue	12.6333172	1	0.0003789
	Syn_cue	0.1848232	1	0.6672606
	AgeGroup	6.1820485	3	0.1030814
	Perception score	7.9199833	1	0.0048892

Dominance	7.9260318	1	0.0048729
Pros_cue:Syn_cue	3.0371852	1	0.0813769
Pros_cue:AgeGroup	3.1465509	3	0.3695771
Syn_cue:AgeGroup	2.4329773	3	0.4875254
Pros_cue:Syn_cue:AgeGroup	8.5705165	3	0.0355812

Table F8. Bilingual model – summary and contrasts

contrast/term	estimate	SE	df	z.ratio	p.value
summary()					
(Intercept)	3.2246162	0.6033219		5.344769	0.0000001
Perception score	0.4508219	0.1601928		2.814246	0.0048892
Dominance	-0.5031539	0.1787199		-2.815321	0.0048729
emmeans(pairwise ~ Pros_cue)					
ISQ - RhQ	3.498053	0.5192987	Inf	6.736109	0.0000000
emmeans(pairwise ~ Syn_cue AgeGroup Pros_cue)					
no.cue - RD 6 ISQ	-0.1852016	0.4307909	Inf	-0.4299107	0.6672606
no.cue - RD 7 ISQ	-0.3983879	0.4487625	Inf	-0.8877478	0.3746765
no.cue - RD 8 ISQ	0.7866603	0.9184374	Inf	0.8565204	0.3917100
no.cue - RD 9 ISQ	0.5144386	0.5925210	Inf	0.8682199	0.3852739
no.cue - RD 6 RhQ	0.7377246	0.3079132	Inf	2.3958852	0.0165803
no.cue - RD 7 RhQ	-0.2218922	0.3335652	Inf	-0.6652140	0.5059136
no.cue - RD 8 RhQ	-0.5586928	0.3771686	Inf	-1.4812811	0.1385317
no.cue - RD 9 RhQ	-0.8060993	0.3598143	Inf	-2.2403205	0.0250701

F.2.2 Three-level comparison

In this set of models, the three levels of the Syntactic cue (neutral vs ambiguous vs rhetorical) were contrasted within the RhQ prosodic condition.

Table F9. Monolingual model

Maximal model	Accuracy ~ Syn_cue * AgeGroup + Perception score + Irony score + VOCD_it + Speech rate_it + (1 Participant) + (1 Noun)			
Final model	Accuracy ~ Syn_cue * AgeGroup + Perception score + (1 Participant) + (1 Noun)			
Anova	Predictor	Chisq	df	p.value
	(Intercept)	2.887023	1	0.0892958
	Syn_cue	21.582430	2	0.0000206
	AgeGroup	1.479398	3	0.6870334
	Perception score	15.394606	1	0.0000872

Syn_cue:AgeGroup	18.356664	6	0.0054000
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Table F10. Monolingual model – summary and contrasts

contrast/term	estimate	SE	df	z.ratio	p.value
summary()					
(Intercept)	1.030603	0.6065493		1.699124	0.0892958
Perception score	1.198510	0.3054622		3.923596	0.0000872
emmeans(pairwise ~ Syn_cue)					
no.cue - RD	-0.2594222	0.1904410	Inf	-1.362218	0.3609022
no.cue - ma	-3.2204339	0.3948418	Inf	-8.156264	0.0000000
RD - ma	-2.9610117	0.3911952	Inf	-7.569141	0.0000000
emmeans(pairwise ~ Syn_cue AgeGroup)					
no.cue - RD 6	0.2612845	0.3237567	Inf	0.8070397	0.6986555
no.cue - ma 6	-1.2708808	0.3443257	Inf	-3.6909267	0.0006540
RD - ma 6	-1.5321653	0.3475790	Inf	-4.4081062	0.0000310
no.cue - RD 7	-0.4158381	0.3462073	Inf	-1.2011246	0.4524758
no.cue - ma 7	-2.6515961	0.4501345	Inf	-5.8906745	0.0000000
RD - ma 7	-2.2357579	0.4443666	Inf	-5.0313365	0.0000015
no.cue - RD 8	-0.3377921	0.4124312	Inf	-0.8190265	0.6912084
no.cue - ma 8	-3.2178645	0.6401789	Inf	-5.0265080	0.0000015
RD - ma 8	-2.8800724	0.6340333	Inf	-4.5424624	0.0000166
no.cue - RD 9	-0.5453430	0.4301165	Inf	-1.2678960	0.4133981
no.cue - ma 9	-5.7413943	1.2987541	Inf	-4.4206939	0.0000293
RD - ma 9	-5.1960513	1.2900492	Inf	-4.0277933	0.0001664
emmeans(pairwise ~ AgeGroup Syn_cue)					
AgeGroup6 - AgeGroup7 no.cue	0.3939152	0.8019007	Inf	0.4912270	0.9610744
AgeGroup6 - AgeGroup8 no.cue	-0.5311152	0.8365662	Inf	-0.6348753	0.9207877
AgeGroup6 - AgeGroup9 no.cue	-0.3838302	0.8847781	Inf	-0.4338152	0.9726598
AgeGroup7 - AgeGroup8 no.cue	-0.9250304	0.8267158	Inf	-1.1189219	0.6778368
AgeGroup7 - AgeGroup9 no.cue	-0.7777454	0.8632994	Inf	-0.9008988	0.8043531
AgeGroup8 - AgeGroup9 no.cue	0.1472850	0.8853379	Inf	0.1663602	0.9983634
AgeGroup6 - AgeGroup7 RD	-0.2832074	0.8036012	Inf	-0.3524228	0.9849903
AgeGroup6 - AgeGroup8 RD	-1.1301917	0.8427539	Inf	-1.3410697	0.5366510
AgeGroup6 - AgeGroup9 RD	-1.1904577	0.8935829	Inf	-1.3322297	0.5422900

AgeGroup7 - AgeGroup8 RD	-0.8469843	0.8357885	Inf	-1.0133955	0.7415933
AgeGroup7 - AgeGroup9 RD	-0.9072503	0.8760002	Inf	-1.0356736	0.7284632
AgeGroup8 - AgeGroup9 RD	-0.0602659	0.9007359	Inf	-0.0669075	0.9998926
AgeGroup6 - AgeGroup7 ma	-0.9868000	0.8551826	Inf	-1.1539056	0.6559819
AgeGroup6 - AgeGroup8 ma	-2.4780988	0.9693052	Inf	-2.5565724	0.0516769
AgeGroup6 - AgeGroup9 ma	-4.8543437	1.4824334	Inf	-3.2745780	0.0058329
AgeGroup7 - AgeGroup8 ma	-1.4912988	0.9935403	Inf	-1.5009947	0.4368497
AgeGroup7 - AgeGroup9 ma	-3.8675437	1.5017016	Inf	-2.5754409	0.0491554
AgeGroup8 - AgeGroup9 ma	-2.3762449	1.5585173	Inf	-1.5246831	0.4226010

Table F11. Bilingual model

Maximal model	Accuracy ~ Syn_cue * AgeGroup + Perception score + Irony score + VOCD_it + Speech rate_it + Dominance + (1 Participant) + (1 Noun)				
Final model	Accuracy ~ Syn_cue * AgeGroup + Perception score + Dominance + (1 Participant) + (1 Noun)				
Anova	Predictor	Chisq	df	p.value	
	(Intercept)	0.2506095	1	0.6166462	
	Syn_cue	21.1155207	2	0.0000260	
	AgeGroup	0.2290579	3	0.9727674	
	Perception score	5.1128156	1	0.0237497	
	Dominance	3.8433730	1	0.0499430	
	Syn_cue:AgeGroup	17.9795530	6	0.0062835	

Table F12. Bilingual model – summary and contrasts

contrast/term	estimate	SE	df	z.ratio	p.value
summary()					
(Intercept)	0.2910449	0.5813814		0.5006092	0.6166462
Perception score	0.5218037	0.2307688		2.2611536	0.0237497
Dominance	-0.5084856	0.2593716		-1.9604522	0.0499430
emmeans(pairwise ~ Syn_cue)					
no.cue - RD	-0.2460187	0.1887058	Inf	-1.303716	0.3930629
no.cue - ma	-2.7165000	0.3756261	Inf	-7.231926	0.0000000
RD - ma	-2.4704813	0.3632373	Inf	-6.801287	0.0000000
emmeans(pairwise ~ Syn_cue AgeGroup)					
no.cue - RD 6	0.7491632	0.3278866	Inf	2.2848242	0.0579289
no.cue - ma 6	-1.3247805	0.4965805	Inf	-2.6678063	0.0208521
RD - ma 6	-2.0739438	0.4669712	Inf	-4.4412669	0.0000266
no.cue - RD 7	-0.2062651	0.3556566	Inf	-0.5799557	0.8308488

no.cue - ma 7	-2.1590100	0.5842273	Inf	-3.6954965	0.0006425
RD - ma 7	-1.9527450	0.5515750	Inf	-3.5403073	0.0011630
no.cue - RD 8	-0.6336518	0.4120049	Inf	-1.5379713	0.2731417
no.cue - ma 8	-3.1715669	0.7373771	Inf	-4.3011464	0.0000505
RD - ma 8	-2.5379152	0.7070011	Inf	-3.5896905	0.0009654
no.cue - RD 9	-0.8933212	0.3925263	Inf	-2.2758254	0.0592281
no.cue - ma 9	-4.2106425	0.7856026	Inf	-5.3597612	0.0000002
RD - ma 9	-3.3173213	0.7665190	Inf	-4.3277743	0.0000448
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emmeans(pairwise ~ AgeGroup Syn_cue)					
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AgeGroup6 - AgeGroup7 no.cue	0.0053194	0.7574835	Inf	0.0070224	0.9999999
AgeGroup6 - AgeGroup8 no.cue	0.0516821	0.8098983	Inf	0.0638131	0.9999068
AgeGroup6 - AgeGroup9 no.cue	-0.2845686	0.7585853	Inf	-0.3751307	0.9820086
AgeGroup7 - AgeGroup8 no.cue	0.0463627	0.8307538	Inf	0.0558080	0.9999376
AgeGroup7 - AgeGroup9 no.cue	-0.2898880	0.7727337	Inf	-0.3751460	0.9820065
AgeGroup8 - AgeGroup9 no.cue	-0.3362507	0.8252954	Inf	-0.4074308	0.9771644
AgeGroup6 - AgeGroup7 RD	-0.9501089	0.7884080	Inf	-1.2050981	0.6235854
AgeGroup6 - AgeGroup8 RD	-1.3311329	0.8532634	Inf	-1.5600491	0.4016710
AgeGroup6 - AgeGroup9 RD	-1.9270531	0.8061343	Inf	-2.3904864	0.0788745
AgeGroup7 - AgeGroup8 RD	-0.3810240	0.8715310	Inf	-0.4371892	0.9720472
AgeGroup7 - AgeGroup9 RD	-0.9769441	0.8166878	Inf	-1.1962272	0.6292267
AgeGroup8 - AgeGroup9 RD	-0.5959202	0.8684861	Inf	-0.6861597	0.9024206
AgeGroup6 - AgeGroup7 ma	-0.8289102	0.7063033	Inf	-1.1735896	0.6435744
AgeGroup6 - AgeGroup8 ma	-1.7951043	0.8299384	Inf	-2.1629368	0.1336889
AgeGroup6 - AgeGroup9 ma	-3.1704306	0.8694353	Inf	-3.6465399	0.0015155
AgeGroup7 - AgeGroup8 ma	-0.9661941	0.8610796	Inf	-1.1220729	0.6758800
AgeGroup7 - AgeGroup9 ma	-2.3415205	0.8855840	Inf	-2.6440412	0.0408425
AgeGroup8 - AgeGroup9 ma	-1.3753263	0.9824771	Inf	-1.3998559	0.4993881

F.2.3 Dominance

Table F13. Bilingual children, model with binned dominance

Maximal model	Accuracy ~ Syn_cue * AgeGroup * Binned dominance + (1 Participant) + (1 Noun)
Final model	Accuracy ~ Syn_cue * AgeGroup * Binned dominance + (1 Participant) + (1 Noun)

Anova	Predictor	Chisq	df	p.value
	(Intercept)	0.1848875	1	0.6672062
	Syn_cue	27.7386299	2	0.0000009
	AgeGroup	0.0553932	1	0.8139312
	Binned dominance	1.2340134	1	0.2666279
	Syn_cue:AgeGroup	13.9481763	2	0.0009358
	Syn_cue:Binned dominance	4.7827735	2	0.0915027
	AgeGroup:Binned dominance	1.5212973	1	0.2174233
	Syn_cue:AgeGroup:Binned dominance	0.4985751	2	0.7793558

Table F14. Bilingual children, model with binned dominance – contrasts

contrast	estimate	SE	df	z.ratio	p.value
emmeans(pairwise ~ Binned dominance AgeGroup Syn_cue)					
ge - it 6 no.cue	-1.0529544	0.9478718	Inf	-1.1108616	0.2666279
ge - it 9 no.cue	-2.7738226	1.0312510	Inf	-2.6897646	0.0071502
ge - it 6 RD	-0.6191697	0.9474353	Inf	-0.6535219	0.5134199
ge - it 9 RD	-2.8042795	1.0632127	Inf	-2.6375527	0.0083507
ge - it 6 ma	0.3488886	0.9644539	Inf	0.3617474	0.7175408
ge - it 9 ma	-0.8709903	1.5122575	Inf	-0.5759537	0.5646465

F.3 Chapter 4 – Production task – Adults and monolingual children

Table F15. Rate of modification model

Maximal model	Sum of cues ~ AgeGroup*Condition + (1 Participant) + (1 Item)			
Final model	Sum of cues ~ AgeGroup*Condition + (1 Participant) + (1 Item)			
Anova	Predictor	Chisq	df	p.value
	(Intercept)	0.912868	1	0.3393546
	AgeGroup	4.179183	4	0.3822988
	Condition	34.584825	1	0.0000000
	AgeGroup:Condition	113.046594	4	0.0000000

Table F16. Rate of modification model – contrasts

contrast	estimate	SE	df	z.ratio	p.value
emmeans(pairwise ~ AgeGroup Syn_cue)					
6 - 7 ISQ	0.0088796	0.1260334	Inf	0.0704540	0.9999944
6 - 8 ISQ	-0.0424202	0.1276585	Inf	-0.3322944	0.9973758
6 - 9 ISQ	-0.1299342	0.1294382	Inf	-1.0038320	0.8537329
6 - Adults ISQ	-0.1711451	0.1078926	Inf	-1.5862546	0.5062108
7 - 8 ISQ	-0.0512998	0.1318146	Inf	-0.3891812	0.9951553
7 - 9 ISQ	-0.1388138	0.1335387	Inf	-1.0395020	0.8370096
7 - Adults ISQ	-0.1800247	0.1127786	Inf	-1.5962656	0.4997360
8 - 9 ISQ	-0.0875140	0.1350736	Inf	-0.6478988	0.9670809
8 - Adults ISQ	-0.1287249	0.1145926	Inf	-1.1233262	0.7942727
9 - Adults ISQ	-0.0412109	0.1165718	Inf	-0.3535237	0.9966608
6 - 7 RhQ	-0.2894291	0.1259690	Inf	-2.2976213	0.1455404
6 - 8 RhQ	0.0375000	0.1276193	Inf	0.2938427	0.9983774
6 - 9 RhQ	-0.5208333	0.1294382	Inf	-4.0237993	0.0005486
6 - Adults RhQ	-0.5840870	0.1078632	Inf	-5.4150702	0.0000006
7 - 8 RhQ	0.3269291	0.1317148	Inf	2.4820976	0.0946533
7 - 9 RhQ	-0.2314043	0.1334779	Inf	-1.7336520	0.4131522
7 - Adults RhQ	-0.2946580	0.1126792	Inf	-2.6150177	0.0676299
8 - 9 RhQ	-0.5583333	0.1350365	Inf	-4.1346847	0.0003428
8 - Adults RhQ	-0.6215870	0.1145211	Inf	-5.4277065	0.0000006
9 - Adults RhQ	-0.0632537	0.1165446	Inf	-0.5427424	0.9828405

F.4 Chapter 5 – Production task – Bilingual and monolingual children

F.4.1 Proficiency and language dominance measures

Table F17. VOCD model

Maximal model		VOCD_it ~ Group * Age			
Final model		VOCD_it ~ Group * Age			
Anova	Predictor	Sum Sq	df	F value	p.value
	(Intercept)	723.99979	1	18.4777546	0.0000294
	Group	121.13712	1	3.0916334	0.0805611
	Age	17.03999	1	0.4348907	0.5105239
	Group:Age	224.33626	1	5.7254579	0.0178511

Table F18. VOCD model – emtrends

group	trend	SE	df	t.ratio	p.value
emtrends(var = "Age", pairwise~Group, infer = T)					
Bili.Chi	0.3628311	0.5501923	164	0.6594624	0.5105239
Mono.Chi	2.3028382	0.5955150	164	3.8669694	0.0001586

Table F19. Speech rate model

Maximal model		Speech rate ~ Group * Age			
Final model		Speech rate ~ Group + Age			
Anova	Predictor	Sum Sq	df	F value	p.value
	(Intercept)	3.430933	1	18.587174	0.0000277
	Group	3.197076	1	17.320245	0.0000505
	Age	1.791176	1	9.703741	0.0021649

Table F20. Speech rate model – effects

group	trend	SE	t.ratio	p.value
(Intercept)	0.9683416	0.2246063	4.311285	0.0000277
GroupMono.Chi	0.2744842	0.0659539	4.161760	0.0000505
Age	0.0858408	0.0275565	3.115083	0.0021649

Table F21. Dominance model (bilinguals only)

Maximal model		Dominance ~ Age			
Final model		Dominance ~ Age			
Anova	Predictor	Sum Sq	df	F value	p.value
	(Intercept)	71.186841	1	2.7151060	0.1030515

Age	3.556011	1	0.1356283	0.7135714
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F.4.2 Rate of modification

Table F22. Both groups model

Maximal and final model		Sum of cues ~ Group*Condition*AgeGroup + Group*Condition*VOCD_it + Group*Condition*Speech rate_it + (1 Participant) + (1 Item)		
Anova	Predictor	Chisq	df	p.value
	(Intercept)	0.6335523	1	0.4260553
	Group	0.0097541	1	0.9213267
	Condition	63.0044846	1	0.0000000
	AgeGroup	0.2696598	3	0.9656299
	VOCD_it	0.1167043	1	0.7326368
	Speech rate_it	0.4832293	1	0.4869632
	Group:Condition	0.3852822	1	0.5347898
	Group:AgeGroup	0.1271105	3	0.9883965
	Condition:AgeGroup	16.1380746	3	0.0010624
	Group:VOCD_it	0.7384589	1	0.3901550
	Condition:VOCD_it	29.4270548	1	0.0000001
	Group:Speech rate_it	0.0207404	1	0.8854883
	Condition:Speech rate_it	1.1546408	1	0.2825798
	Group:Condition:AgeGroup	66.9691336	3	0.0000000
	Group:Condition:VOCD_it	25.0424710	1	0.0000006
	Group:Condition:Speech rate_it	4.4079366	1	0.0357721

Table F23. Both groups model – contrasts and emtrends

contrast/term	estimate	SE	df	t/z.ratio	p.value
emmeans(pairwise ~ Group Condition)					
Bili.Chi - Mono.Chi ISQ	-0.0086214	0.0583578	Inf	-0.1477337	0.8825529
Bili.Chi - Mono.Chi RhQ	-0.3415747	0.0583443	Inf	-5.8544629	0.0000000
emmeans(pairwise ~ AgeGroup Group Condition)					
AgeGroup6 - AgeGroup7 Bili.Chi RhQ	0.1628888	0.1050501	Inf	1.5505818	0.4072315
AgeGroup6 - AgeGroup8 Bili.Chi RhQ	0.1630387	0.1103410	Inf	1.4775900	0.4510930
AgeGroup6 - AgeGroup9 Bili.Chi RhQ	0.0294565	0.1008583	Inf	0.2920578	0.9913330
AgeGroup7 - AgeGroup8 Bili.Chi RhQ	0.0001499	0.1176008	Inf	0.0012747	1.0000000
AgeGroup7 - AgeGroup9 Bili.Chi RhQ	-0.1334323	0.1055079	Inf	-1.2646673	0.5855253
AgeGroup8 - AgeGroup9 Bili.Chi RhQ	-0.1335823	0.1090090	Inf	-1.2254244	0.6106270
AgeGroup6-AgeGroup7 Mono.Chi RhQ	-0.3340708	0.1087264	Inf	-3.0725815	0.0114052
AgeGroup6-AgeGroup8 Mono.Chi RhQ	0.0285288	0.1122666	Inf	0.2541169	0.9942467

AgeGroup6-AgeGroup9 Mono.Chi RhQ	-0.5334036	0.1206414	Inf	-4.4213992	0.0000579
AgeGroup7-AgeGroup8 Mono.Chi RhQ	0.3625996	0.1087382	Inf	3.3346110	0.0047390
AgeGroup7-AgeGroup9 Mono.Chi RhQ	-0.1993328	0.1131292	Inf	-1.7619927	0.2918285
AgeGroup8-AgeGroup9 Mono.Chi RhQ	-0.5619324	0.1104866	Inf	-5.0859796	0.0000022
emtrends(var = "vocd_it", pairwise~Condition Group, infer = T)					
ISQ Bili.Chi	0.0136325	0.0399055	Inf	0.3416200	0.7326368
RhQ Bili.Chi	0.1252337	0.0399055	Inf	3.1382560	0.0016996
ISQ Mono.Chi	0.0657466	0.0456652	Inf	1.4397532	0.1499372
RhQ Mono.Chi	0.0207984	0.0456482	Inf	0.4556245	0.6486601
emtrends(var = "speech rate_it", pairwise~Condition Group, infer = T)					
ISQ Bili.Chi	0.0267667	0.0385052	Inf	0.6951470	0.4869632
RhQ Bili.Chi	0.0480974	0.0385052	Inf	1.2491166	0.2116224
ISQ Mono.Chi	0.0356812	0.0484656	Inf	0.7362182	0.4615979
RhQ Mono.Chi	-0.0100128	0.0484609	Inf	-0.2066156	0.8363101

Table F24. Bilingual only model

Maximal and final model		Sum of cues ~ Dominance*Condition + (1 Participant) + (1 Item)			
Anova	Predictor	Chisq	df	p.value	
	(Intercept)	4.4939262	1	0.0340155	
	Dominance	0.9026729	1	0.3420660	
	Condition	85.2506196	1	0.0000000	
	Dominance:Condition	15.5980963	1	0.0000783	

Table F25. Both groups model – emtrends

term	estimate	SE	df	t.ratio	p.value
emtrends(pairwise ~ Condition, var = "Dominance", infer = T)					
ISQ	-0.0054992	0.0057881	99.3698	-0.950091	0.3443711
RhQ	-0.0175794	0.0057881	99.3698	-3.037173	0.0030503