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The acquisition of scalar implicatures in bilingual children

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INTRODUCTION

The aim of this dissertation was to investigate the acquisition of pragmatics by children, more specifically bilingual children by comparing them to monolingual children. In particular, the focus has been on the acquisition of scalar implicatures, as over the last twenty years or so the field of Experimental pragmatics has emerged. As a matter of fact, one of the aims of Experimental pragmatics is to understand how and when children acquire pragmatic abilities, such as scalar implicatures.

The process of language acquisition is a fascinating process that has led many disciplines and scholars to investigate this human capacity. It is interesting to reflect on the importance of language and what allows us to do: through language human beings can communicate their thoughts and desires, they can give information to others, express their feelings, warn a friend of a danger etc… Language allows human beings to talk about the presence, but also about past and future experiences. But what is so special about language? Language is the most peculiar capacity of the human species, as it distinguishes us even from the most perfect and evolved of the other species. Language is a distinctive feature of human beings. To study the human language is to understand something about the functioning of the human being (Gleitman and Lieberman, 1995). Animals communicate to solve specific problems, such as to warn their conspecific of the presence of a predator or to indicate a place in which the food is located. It is difficult, however, to say that these forms of communication are comparable to the human language since language is an exclusive human capacity (Guasti, 2007).

Let us consider the case in which an alien lands on our planet, more specifically in an English-speaking country. In the situation described the alien possesses the vocabulary of the English language and an algorithm that allows him/her to decode the grammatical structure of English. At one point the alien hears the following utterance: “It is raining cats and dogs”. Will he/she be able to correctly decode the meaning intended by the speaker with the tools at his/her disposal? The answer is no. In fact, the alien lacks the ability to integrate the linguistic information with the contextual information in order to decode the message that the speaker wanted to convey (Bambini,

2017). This example shows that human communication is not a linear exchange of information. What is central to the field of pragmatics is indeed the distinction between what is said or the literal meaning and what is meant by the speaker or the non-literal meaning. Quite often, in human communication, what is said do not always correspond to what the speaker intended to mean with his/her utterance. In order to appropriately understand the meaning intended by the speaker both the linguistic conventions used to express a meaning and the context of the utterance must be taken into account (Bambini, 2017). In human communication, both the information of the utterance and the context are assumed as premises and from them inferences are made. With the term "inference" a cognitive operation is meant, and this cognitive operation derives a conclusion based on the information available (Bambini, 2017). The results of pragmatic inferences are hypotheses on the meaning of the speaker. One of the most important contributions to the field of pragmatics is the one given by Paul Grice, who introduced the Theory of Conversation, stating that conversation is guided by a Cooperative Principle that is divided into four maxims: Quality, Quantity, Relevance and Manner. According to Grice, inferences are implicit statements that are inferred in a conversation following either the apparent violation or the observation of a conversational maxim, on the base of the assumption that interlocutors are nevertheless cooperative in their contribution to the conversation (Grice, 1975).

Certain information is expressed by choosing words expressing one value from a scale of values, such as "<all, most, many, some, few>" (Yule, 1996, p. 41). In fact, it is argued that if a speaker says "Some students passed the exam", the hearer is entitled to assume that the speaker intended "Some students passed the exam, *but not all*" (Guasti et al., 2005, p. 669). The added meaning "*but not all*" represents the concept of scalar implicature and is an inference that is derived by the speaker's decision to use the quantifier "some" instead of other quantifiers of the scale, because if the speaker meant the more informative "all" he would have said so. The notion of implicature was introduced by Grice to account for the discrepancy between the logical interpretation of logical words, such as quantifiers and their interpretation in discourse. Taking in consideration the above example with "some", the sentence "Some students passed the exam" will be true both if all students passed the exam (logical interpretation) and if only a group of students passed the exam (pragmatic interpretation). In conversations,

however, logical interpretations are rarely found and pragmatic interpretations are computed on the basis of the Maxim of Quantity, stating that the speaker has to say as much as he/she can, but no more than is strictly necessary (Dupuy et al., 2018).

Few studies have been conducted on both adults and children, both monolingual and bilingual, aiming at understanding how scalar implicatures are computed, what processes are involved in the acquisition of scalar implicatures and at what age children begin to derive them. The focus of this dissertation will be on how scalar implicatures are computed by bilingual children, more specifically whether bilingualism represents an advantage in the computation of these enriched terms or not.

The first chapter of this dissertation investigates the field of pragmatics. First, an historical account of the term will be given; second, an attempt to define the field of pragmatics will be sketched. Pragmatics will be defined through some of the topics analysed by pragmatists, that is, speech acts, deixis, presupposition and implicatures. The last section of the first chapter will focus on implicatures, more specifically conversational and conventional implicatures. Here, Grice's Theory of Conversation and the notion of scalar implicatures will be deepened.

The second chapter of this dissertation will be dealing with the monolingual and bilingual acquisition of language. First, the most influential theories on language acquisition will be proposed: behaviourism, innatism, emergentism and the usage-based theory. Second, the most fundamental stages in the acquisition of language will be discussed: from the discrimination between languages from birth to the first production of words and the development of vocabulary. Last, the bilingual acquisition of language will be presented. In this last section the term "bilingualism" will be explained and the similarities and the differences between monolingual and bilingual acquisition of a language will be outlined. Moreover, in the last part of this last section, the way bilingual interact with both monolinguals and bilinguals will be discussed.

The third chapter of this dissertation will concentrate on some of the studies conducted on both monolingual and bilingual children to study the computation of scalar implicatures. In the first section, three studies (Noveck, 2001, Guasti et al., 2005, Foppolo et al., 2012) conducted on monolingual children will be presented, whereas in the last section three studies (Siegal et al., 2007, Antoniou and Katsos, 2017, Dupuy et al., 2018) conducted on bilingual children will be proposed. The aim of these studies

was to understand how children behave when are asked to resort to their pragmatic abilities, more specifically if bilingual children are able to compute scalar implicatures and whether bilingualism is an advantage that helps them in this computational process.

The thesis concludes with a brief discussion on the main findings presented in Chapter 3 and their relevance to the field of Experimental pragmatics.

PRAGMATICS IN LINGUISTICS

1.1 Introduction

For a long period of time in the study of language, the interest has been on discovering abstract rules and principles lying at the core of language. These rules and principles were often derived from logic and mathematics. In fact, linguists and philosophers of language initially did not consider the everyday language use, that is, how linguistic conventions are used by human beings in their everyday life, so much that pragmatics has often been considered as a "wastebasket" (Yule, 1996, p. 6). The contents of the wastebasket were defined negatively, as they were considered complicated notions and concepts that were difficult to define within formal systems of analysis.

Nowadays, the field of pragmatics is no longer considered as the field dealing with the "wastebasket" of languages, more and more linguists and philosophers have focused their attention on the study of this field since they understood that communication is the primary use of a language. Even though the definition of the field of pragmatics is not an easy job, what is generally accepted is that pragmatics is the branch of linguistics dealing with how language is used in communication, that is, the study of how linguistic forms are used by its users to convey a message.

The aim of this chapter is to attempt to provide a discussion of the term pragmatics and, hence, to define and explain the concept of implicature, more specifically scalar implicature. First, the historical origin of the term pragmatics will be briefly analysed. Second, an explanation of the definition of pragmatics and its field of work will be provided. Last, the concept of implicature will be explained.

1.2 The origin of the modern usage of the term pragmatics

Even though there is a minimal, almost insignificant relation between the philosophical doctrines of pragmatism and pragmatics, after Locke and Peirce the philosopher Charles Morris (1901-1979) attempted to define the general shape of a science of signs or, as Morris preferred, semiotic. Morris identified three distinct fields

of research within semiotics: syntax or the study of "the formal relation of signs to one another", semantics or the study of "the relations of signs to the objects to which the signs are applicable", and pragmatics or the study of "the relation of signs to interpreters" (Morris, 1938, p. 6). Within each branch of semiotics, another distinction could be made: the distinction between pure studies, concerned with "the elaboration of metalanguage", and descriptive studies, concerned with "the application of metalanguage to the description of specific signs and their usages" (Morris, 1971, p. 24).

Over the course of years, the term pragmatics has received different interpretations: on one hand, the broad usage of the term introduced by Morris has been maintained, and in this view pragmatics is connected to matters such as psychopathology of communication and the evolution of symbol systems, it also covers branches, such as sociolinguistics and psycholinguistics (Levinson, 1983); on the other hand, pragmatics has progressively narrowed its meaning, distancing from Morris' definition. The philosopher and logician Carnap (1891-1970) has been particularly important in this: he first adopted Morris' usage, but then he introduced a new version of it. As a matter of fact, Carnap stated that "If in an investigation explicit reference is made to the speaker, or to put it in more general terms, to the user of the language, then we assign it [the investigation] to the field of pragmatics" (Carnap, 1938, p. 2). Carnap confused his explanation by adopting Morris' distinction between pure and descriptive studies, concluding that pragmatics could have been equated with descriptive semiotics in general (Carnap, 1959). Carnap also believed that in his definition there was room for a pure pragmatics concerned with concepts like belief, utterance and intension and their logical inter-relation, thus he did not propose a consistent and coherent definition of the term. In both Morris's and Carnap's usages, the term pragmatics presented three systematic ambiguities: (a) "it was applied to branches of inquiry (as in the case of distinction between semantics and pragmatics)", (b) "it was applied to specific features of a language under investigation" and (c) "it was applied to the characteristics of the metalanguage" (Levinson, 1983, p. 3). Even though Carnap's definition was incoherent, it led to a further restriction of the term, in fact in the late 1960s an implicit version of Carnap's definition was adopted within linguistics: pragmatics was considered to be

concerned with “investigations requiring reference to the users of a given language” (Levison, 1983, p. 4).

For a long period of time in the study of language, philosophers and linguists were interested in abstract and logic principles of languages, they did not consider the everyday language use (Yule, 1996). As it has been presented above, from the 1960s a huge shift in linguistics took place, in fact more and more linguists and philosophers of language were interested in the relationships between linguistic forms and its users (Yule, 1996). Therefore, Carnap’s definition might be changed as “those linguistic investigations that make necessary reference to aspects of the context” (Levinson, 1983, p. 5), where the concept of context includes participants and the temporal and spatial parameters of the speech event. Additionally, the beliefs, knowledge and intentions of the participants of a conversation are included in the concept of context. Given a brief summary of the historical origin of the term pragmatics, the purpose of the next section is to provide a clear definition of pragmatics and its field of work.

1.3 A definition of pragmatics

Pragmatics is a heterogeneous and highly fragmented field, therefore there is not a coherent and unified definition of it. Even in the most canonical book “Pragmatics” (1983) by Levinson the attempt to provide a unified definition of pragmatics fails. In fact, even pragmatists, although sharing the same field of study, often do not share the same basic assumptions or goals (Ariel, 2010). Because of this, a “list of canonized pragmatic topics” has often been presented and the list includes speech acts, deixis, presupposition and implicatures. The field of pragmatics is thus definable through the topics analysed by pragmatists (Ariel, 2010). Pragmatists opted for a “list of canonized topics” as a practical solution since some of them simply resigned themselves to the idea that the field cannot be defined. However, this solution is not useful when determining whether a new phenomenon discovered can be considered pragmatic or not.

Both the fields of semantics and pragmatics are concerned with meaning, but a different usage of the same verb “to mean” can be noticed. An example taken form Leech (1983, p. 6) will be now proposed for a clear explanation of the concept:

(1) What does X mean?

(2) What did you mean by X?

In the example above, (1) represents a semantic meaning, whereas (2) represents a pragmatic meaning. As a matter of fact, the field of pragmatics is concerned with "the study of meaning as communicated by a speaker and interpreted by a listener" (Yule, 1996, p. 3). Pragmatics analyses "what people want to mean by their utterances and not what words in those utterances mean by themselves" (Yule, 1996, p. 3). A distinction between the notion of utterance and sentence must be made: an utterance is the product of the enunciation of a sentence in a real context, whereas a sentence is a theoretical entity defined within grammar (Levinson, 1983). The concept of context is relevant to pragmatics since it is referred to as "the study of contextual meaning" (Yule, 1996, p. 3). Pragmatics is necessarily involved in the interpretation of what people intend to mean in a particular context and how the context conditions what is said. Moreover, pragmatics is considered also as "the study of how more gets communicated than is said" (Yule, 1996, p. 3) since it explores how listeners can make inferences about what is said to interpret the speaker's intended meaning.

When expressing themselves, people produce utterances and, sometimes through those utterances, they perform actions, and these actions are called speech acts. A speaker normally expects the hearer to interpret his/her communicative intentions and in this process both the speaker and the hearer are helped by the circumstances of the utterances (Yule, 1996). It is useful to reference to one or more of the aspects of the speech situations in general since pragmatics is concerned with meaning connected to a speech situation. According to Leech (1983, p. 13), different aspects of speech situations can be considered criteria for the definition of the field of pragmatics. They will be now presented:

i. Addressers or addressees

   As a matter of convenience, in the literature, addresser and addressee are often referred to as speaker and hearer. It is important to point out the possible distinction between receiver and addressee. The former is "a person who receives and interprets a message" (Leech, 1983, p. 13), whereas the latter is "a person who is an *intended* receiver of the message" (Leech, 1983,

p. 13). According to Leech (1983, p. 13), a receiver might be "a bystander or an eavesdropper, rather than an addressee".

ii. The context of an utterance

The concept of context has been interpreted in many ways. Context is considered to include any background knowledge, such as the physical or social setting, that are shared by an addresser and an addressee, and which contribute to the interpretation of an utterance (Leech, 1983).

iii. The function of an utterance

When a speaker performs an action through an utterance, he/she produces a speech act with a specific communicative intention in mind. In fact, communication takes place if an addressee, having heard the utterance performed, understands what effect the addresser intended to have on him/her (Harris, 2019). In English speech acts are given specific functions, such as apology, complaint, compliment, invitation, promise or request (Yule, 1996).

As already said, utterances are often produced to perform actions, which are called speech acts. Three types of speech acts can be found (Leech, 1983, p. 1999):

1. Locutionary act
2. Illocutionary act
3. Perlocutionary act

The first act, called locutionary act, represents the performance of a meaningful utterance. The illocutionary act corresponds to the communicative intention of the addresser and is performed thanks to the communicative force of an utterance, namely the illocutionary force. The third act, called perlocutionary act, represents the effect the addresser wants his or her utterance to have on the addressee (Yule, 1996). Consider (3):

(3) a. I'll see you later (=A)

b. [I predict that] A.

c. [I promise you that] A.

d. [I warn you that] A. (Yule, 1996, p. 49)

As it can be seen, the same locutionary act (3a) can represent different communicative intentions, such as a prediction (3b), a promise (3c) and a warning (3d). The different analyses of the same utterance represent different illocutionary forces that will provoke different effects on the addressee. The appropriate interpretation of the utterances depends on the speaker's intentions and on the context in which they are performed (Yule, 1996).

The diagram taken from Leech (1983, p. 199) shown in Figure 1.1 exemplifies how speech acts work. The line at the bottom of the diagram represents a phonetic act, so the actual execution of the utterance. This diagram shows that the locutionary act is correctly performed when the events in 2-3-4-5 occur; the illocutionary act is correctly performed if the events in 1-2-3-4-5-6 take place in the correct order. If the acts are performed accurately, the hearer or addressee will be able to decode the message properly (Leech, 1983).

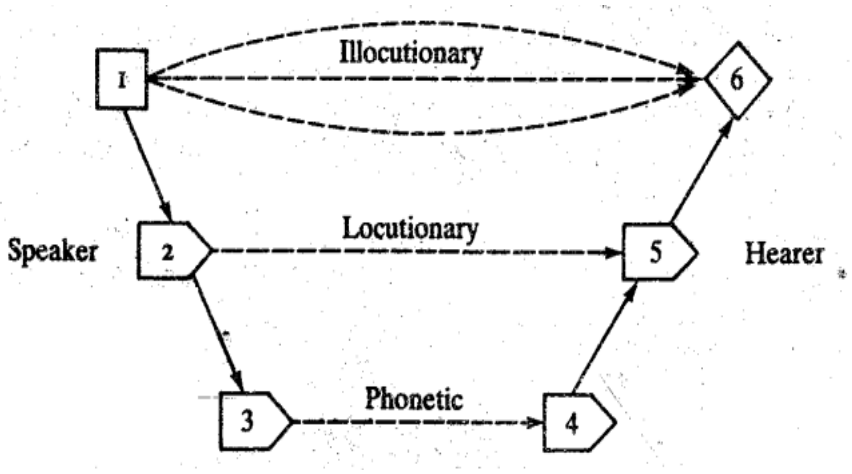

Figure 1.1 Schematic representation of how speech acts work.

Leech N. Geoffrey, (1983). Principles of Pragmatics, New York, Longman Inc., p. 199

As previously mentioned, pragmatics deals with the interpretation of a speaker's intended meaning. The more background knowledge a speaker and a hearer have in common, the less words they will need to use to identify the intended meaning (Yule,

1996). Classical examples of this are indexical expressions, such as *here, today, that, I, you.* Indexical expressions are also called deixis, which is a term that comes from Greek and means "pointing via language". Deictic expressions can be divided into three categories (Yule, 1996, p. 9):

1. Person deixis (me, you)
2. Spatial deixis (here, there)
3. Temporal deixis (now, then)

Indexical expressions require the addressee to resort to the same contextual information of the speaker in order to understand the expressions in a given context in the correct way (Ariel, 2010). An example will be now offered:

(4) I'll put this here (Yule, 1996, p. 9)

Deictic expressions are mostly used in face-to-face spoken conversations, in which utterances such as the one in (4) are easily understood by the people involved in the interaction, whereas an explanation for people who are not part of it is needed. In fact, it is difficult to understand the utterance in (4) if one is not part of the spoken interaction since the person concerned might not be familiar with the context of the speaker's utterance. According to Yule (1996), the notion of person deixis in English involves a distinction between pronouns for the first person singular ("I"), for the second person singular ("you") and for the third person singular ("he", "she" or "it"). In other languages the deictic categories of speaker, addressee and other(s) are also based on social status markers and when they indicate social status, they are called social deixis. The distinction between a higher status and a lower status that is made through a deictic expression can be found in various languages, such as German ("du/Sie") and Spanish ("tú/Usted"). The choice of one form over another implicitly communicate the type of relationships between the speaker and the hearer, since using a third person pronoun in a conversation, in which the use of a second person pronoun would be possible, symbolizes "non-familiarity" and "distance" (Yule, 1996, pp. 10-11). A speaker can express distance also through spatial deixis: words such as "that" and "there" represents distance from the speaker, whereas "this" and "here" proximity to the speaker (Yule,

1996). The temporal deictic expression “now” indicates that the time of the speaker’s utterance and the time of the speaker’s voice being heard from a listener correspond. The temporal deictic expression “then” represents distance and is connected to events that happened in the past or that will happen in the future (Yule, 1996). As it can be seen, the interpretation of deictic expressions depends on the speaker’s intention and the context in which they are uttered, and they can express both proximity or distance (Yule, 1996). When someone takes part in a conversation, he/she uses linguistic forms in order to enable the listener to understand what he/she is referring to. In fact, reference is the relation between a linguistic expression and the entity in the real word to which it refers. The choice of a linguistic form over another is made according to what the speaker assumes the addressee presumably already knows. In a shared, common context a deictic expression may be enough to a successful reference, but in other cases the identification may require a more elaborated explanation.

Sometimes there is not a direct relation between words and entities in the real world, in this case the addressee has to infer what the speaker is referring to (Yule, 1996). An example of inference will be now considered:

(5) MOM: Use your napkin, please!
CHILD: We didn’t have to in Israel.
J: Well, you’re in America now.
MOM: So be a Roman! (Ariel, 2010, p. 26)

The semantic meaning of “a Roman” is “a person from Rome”, but in this context it is interpreted as “a person behaving in a correct way” or “a person behaving like an American” (based on the say “In Rome do as Romans do”). “Roman” and “behaving correctly/as an American” are different interpretations of the same sentence: the first is the literal interpretation, whereas the second is the inferred one. The second interpretation is possible thanks to “a pragmatic interpretation of the context that is determined by specific uses, made by specific speakers in specific contexts” (Ariel, 2010, p. 26). For this reason, pragmatic meanings are said to be context sensitive since they vary according to the contexts in which they occur (Ariel, 2010).

In the list of “canonized topics”, the concept of presupposition is included. In the preceding explanation, a relevant assumption has been considered: the idea that the addresser expects the addressee to share common information or contextual knowledge. This is part of “what is communicated but not said” and it represents the notion of presupposition. Consider the example in (6):

(6) Mary’s brother bought three horses. (Yule, 1996, p. 25)

When uttering (6) the addresser assumes that a person called Mary exists and that she has a brother. He/she may assume that Mary has just one brother and that he has a lot of money because he can afford to buy three horses.

Presuppositions are considered as a relationship between two propositions: (7a) represents the first proposition *p*, (7b) represents the second proposition *q.* The example in (7c) represents the relationship between (7a) and (7b) where the symbol >> means “presupposes”. The example in (7) shows that the fact that Mary’s dog is cute, presupposes the fact that Mary has a dog.

(7) a. Mary’s dog is cute (= *p*)
b. Mary has a dog (= *q*)
c. *p* >> *q* (Yule, 1996, p. 25)

Now consider the example given in (8). It is possible to notice that (8a) represents the negation of (7a) and that by negating the former sentence the relationship of presupposition does not change. (8b) is still presupposed by (8a), in fact the fact that Mary’s dog isn’t cute, presupposes the fact that Mary has a dog. As the example in (8) demonstrates, the presupposition of a proposition remains true also when the proposition is negated (Yule, 1996).

(8) a. Mary’s dog isn’t cute (= NOT *p*)
b. Mary has a dog (= *q*)
c. *p* >> *q* (Yule, 1996, p. 26)

1.4 Conversational implicatures and scalar implicatures

The notion of implicature is central to the field of pragmatics and it is also cited in the "list of canonized topics". According to Levinson (1983), on one hand implicature is a salient point for the pragmatic explanation of linguistic phenomena and on the other hand the concept of implicature provides explanations on how it is possible to mean more than what is said.

In 1967 the English philosopher Paul Grice (1913-1988) advanced a theory of conversation, that is a theory about how people use language, in which he developed the concept of implicature. According to Grice, conversation is guided by maxims that together express a general co-operative principle. The co-operative principle states: "Make your contribution such as is required, at the stage which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged" (Grice, 1989, p. 26).

Grice's maxims are implicit assumptions one has in conversations, since the participants of a conversation assume that one is normally going to provide the correct amount of information (Yule, 1996).

Grice divided the conversational maxims into four categories (Quantity, Quality, Relevance and Manner) (Levinson, 1983, pp. 101-102):

(9) The Maxim of Quality

"Try to make your contribution one that is true, specifically:

a. Do not say what you believe to be false
b. Do not say that for which you lack adequate evidence"

(10) The Maximum of Quantity

a. "Make your contribution as informative as is required for the current purposes of the exchange
b. Do not make your contribution more informative than is required"

(11) The Maxim of Relevance

"Make your contribution relevant"

(12) The Maxim of Manner

"Be perspicuous, and specifically:

a. Avoid obscurity
c. Avoid ambiguity
d. Be brief
e. Be orderly"

With the proposed maxims, Grice wanted to highlight what speakers have to do to converse efficiently and in a co-operative way, even though he knew that they do not follow these maxims to the letter in real conversations. An example from Levinson (1983, p. 102) will now be presented for a further explanation of the concept:

(13) A: Where's Bill?

B: There's a yellow VW outside Sue's house.

At a first reading B's answer seems to violate two of Grice's maxims (the maxim of Quantity and the maxim of Relevance) and the principle of co-operation. However, the example above shows that the principles can be adopted at some deeper or non-superficial level. Through a more careful reading, we understand that there is a connection between the location of Bill and the location of the yellow VW and we can assume that Bill might be in Sue's house, if he is the owner of a yellow VW car (Levinson, 1983). Speakers do not always adhere to Grice's maxims; in (13) an inference is what appears in B's contribution and in fact, according to Grice, they are implicit statements that are inferred in a conversation following either the apparent violation of a conversational maxim or its observance, as a consequence of the assumption that interlocutors are nevertheless cooperative in their contribution to the conversation. Grice named this type of inference conversational implicature (Grice, 1975). Grice's theory has rapidly gained popularity among linguists of the time and implicatures have immediately been recognized as a key concept of pragmatics. He understood that the difference between the coded and the conveyed is rooted in natural discourse and for this reason he proposed the concept of implicature, more specifically conversational implicature and conventional implicature (Ariel, 2010). First, the notion

of conversational implicature will be explained. Grice understood that inferences arise in two different ways, depending on the relation of the speaker with the maxim: the inferences that arise observing the maxims are called standard implicature, whereas the second type of inferences called floutings or exploitations arise when a speaker consciously decide to flout the maxim in order to exploit its communicative purposes. Floutings or exploitations of the maxims can lead to the creation of traditional "figures of speech" (Levinson, 1983).

(14) A (to passer-by): I've just run out of petrol
B: Oh, there's a garage just around the corner (Levinson, 1983, p. 104)

(15) A: Let's get the kids something
B: Okay, but I veto I-C-E C-R-E-A-M-S (Levinson, 1983, p. 104)

The example in (14) is an example of a standard implicature, whereas the example in (15) is an example of flouting. In (14) B's utterance might imply that A might find petrol in the garage, so B's inference aims to help A. In (15) B's utterance violates the Maxim of Manner. By spelling out the word ice-creams, A wants to make sure that B is not going to mention the word ice-creams in front of the children (Levinson, 1983, p. 104). Conversational implicatures play a central role in linguistic theory, for this reason Grice proposed four distinguishing properties, in order to distinguish them from other kinds of inferences (Levinson 1983, p. 119):

i. Cancellability (or defeasibility)
ii. Non-detachability (or inference based on meaning rather than form)
iii. Calculability
iv. Non-conventionality

According to Grice, conversational implicatures are cancellable because they are not part of the linguistic meaning, they are pragmatically implied, and this means that it is possible to cancel an inference by adding additional presumptions:

(16) Benjamin: Are you having some of this chocolate cake?

Amelia: I'm on a diet. But I'm going to have some anyway (Allot, 2018, p. 14)

The example in (16) is an example of cancellation since the added sentence ("but I'm going to have some anyway") cancels the implicature conveyed by the first sentence ("I'm on a diet").

Conversational implicatures are non-detachable and by this Grice means that "it is not possible to find another way of saying the same thing, which simply lacks the implicature in question" (Grice, 1975, p. 39). As a matter of fact, conversational implicatures are not triggered by using particular lexical items, they would have been generated regardless of the chosen wording since they are triggered because of what is said and not how it is said. The implicature attached to the word "try" exemplifies this feature:

(17) A tried to do x
A attempted to do x
A endeavoured to do x
A set himself to do x (Grice, 1989, p. 43)

"A tried to do x" in (17) implicates "a sort of failure or some chance of failure or that someone thinks or thought there were some chance of failure" (Grice, 1989, p. 43) and this implicature can be noticed also when another verb is used.

Another characteristic described by Grice of conversational implicatures is calculability. Conversational implicatures are calculable, this means that for every implicature such an argument could be made:

(18) S has said that *p*:
a. There's no reason to think S is not observing the maxims, or at least the co-operative principle
b. In order for S to say *p* and be indeed observing the maxims or the co-operative principle, S must think that *q*
c. S must know that it is mutual knowledge that *q* must be supposed if S is to be taken to be co-operating

d. S has done nothing to stop me, the addressee, thinking that *q*
e. Therefore S intends me to think that *q*, and in saying that *p* has implicated *q* (Levinson, 1983, p. 113)

The example in (18) shows that starting from the literal meaning or the sense of an utterance on one hand, and Grice's co-operative principle and maxims on the other hand, the result is that an addressee made the inference as a mean to preserve co-operation (Levinson, 1983).

Lastly, conversational implicatures are non-conventional and by this Grice means that they are not part of the conventional meaning of linguistic expressions:

(19) John's a machine (Levinson, 1983, p. 118)

As the example above demonstrates, an expression with a single meaning like the one in (19) can be associated with various implicatures. As a matter of fact, comparing John to a machine could mean that John is a cold person or that he is efficient in his work (Levinson, 1983).

Grice proposed another distinction between conversational implicatures: generalized conversational implicatures and particularized conversational implicatures. For a further clarification two examples will be presented:

(20) Charlene: I hope you brought the bread and the cheese.
Dexter: Ah, I brought the bread (Yule, 1996, p. 40).

In the example (20) above, Dexter seems to violate the Maxim of Quantity. After Dexter's response, Charlene has to assume that Dexter is cooperating and that he is not flouting the Maxim of Quantity. Since he did not mention cheese, Charlene infers that what is not said was not brought. Charlene assumes that if Dexter had brought the cheese, he would have mentioned it, because in so doing he would not violate the Maxim of Quantity. In cases as the example in (20), to make the correct inferences, no contextual background of the utterance is needed. As a matter of fact, the example in (20) represents a generalized conversational implicature. Generalized implicatures do not require special background knowledge to arise (Yule, 1996). Generalized

conversational implicatures involve in English any kind of phrase with an indefinite article:

(21) I was sitting in a garden one day. A child looked over the fence (Yule, 1996, p. 41)

The implicature that arises from the example in (21) is that the garden and the child are not a specific garden and child of the speaker. The implicature is calculated by supposing that if the speaker had been able to adhere to the Maxim of Quantity, he would have been more informative and specific saying "my garden" and "my child" (Yule, 1996).

Particularized implicatures require specific contexts in order to take place:

(22) Ricky: Hey, coming to the wild party tonight?
Tom: My parents are visiting (Yule, 1996, p. 43)

Tom's response does not adhere to the Maxim of Relevance and to understand it, Ricky has to resort to specific background knowledge that a student expects another to have. In fact, Ricky assumes that Tom is not going to the party because the time that one spends with parents is quiet, therefore he is not going to the party, which represents "a wild time" (Yule, 1996).

The discussion will continue by focusing on the concept of scalar implicature, a concept introduced by the American linguist Laurence Horn in 1972. Scalar implicatures are said to exploit the Maxim of Quantity and Quality (Chierchia and McConnell-Ginet, 2000). First, the notion of linguistic scale must be explained:

(23) $< e_1, e_2, e_3, e_4 \ldots e_n >$ (Levinson, 1983, p. 133)

A linguistic scale as the one in (23) is a set of linguistic alternates, or contrastive expressions of the same grammatical category, which can be placed in a linear order according to their degree of informativeness or semantic strength. "e_1" as in (23) represents "a scalar predicate" (Levinson, 1983, p. 133). A real example will be now taken into account:

(24) I'm studying linguistics and I've completed some of the required courses (Yule, 1996, p. 41)

In the example above, the speaker chooses the word "some" and in so doing he/she creates and implicature, since he/she implicates "not all". In saying "some of the required courses" the speaker creates other implicatures, such as "not most", "not many". As it has been stated before, certain information is expressed by choosing a value from a scale, the example in (23) can be represented as (25):

(25) <all, most, many, some, few>
<always, often, sometimes> (Levinson, 1983, p. 134)

When producing an utterance, a speaker chooses words from a scale that he/she considers to be the most informative and truthful (Yule, 1996). Let's suppose that a class of students asks the professor about the results of the exam and that the professor replies with (26a):

(26) a. Some of you passed the exam
b. Most of you passed the exam
c. All of you passed the exam
d. Some of you – but not most of you or all of you – passed the exam (Delfitto and Zamparelli, 2009, p. 93)

If then, once the results are published, the students find out that they all have passed the exam, a reaction of embarrassed annoyance is acceptable. As a matter of fact, they could feel as if the professor lied to them. From a logic point of view, the professor did not lie since (26a) is true if and only if at least one of the students passed the exam. According to Grice's maxims, the professor violated the Maxim of Quantity because if he had known that most of the students had passed the exam, he could have used (26b). The co-operative principle guided the professor in the choice of words: If the professor chose to use (26a) is because he knew that (26b) and (26c) were not correct for the

given situation. In fact, when interpreting (26a) the addressee applies the co-operative principle, considering the negation in (26 b-c) as true (Delfitto and Zamparelli, 2009).

In contrast to all the conversational implicatures discussed so far, it is relevant to explain another type of implicature introduced by Grice, called conventional implicature. Conventional implicatures do not necessarily need to take place in conversations and do not depend on specific contexts for their interpretation. They are conventionally associated with specific lexical items (Yule, 1996). Conventional implicatures are attached to words, such as "but", "even", "and". An example will be now presented in which "+>" indicates an implicature:

(27) a. Mary suggested black, but I chose white.
b. *p* & *q* (+> *p is in contrast to q*) (Yule, 1996, p. 45)

In the example (27) the English conjunction "but" is present. "Mary suggested black" represents *p*, whereas "I chose white" represents *q*. As it can be seen, the facts that "Mary suggested black" and that "I chose white" are contrasted through the conventional implicature created by "but". The interpretation of utterances presenting the conjunction "but" will be based on the logic combination *p* & *q* plus an implicature of contrast between the information in *p* and the information in *q,* as exemplified in (27b) (Yule, 1996).

The word "even", when included in sentences describing events, expresses a conventional implicature with the meaning of "contrary to expectation":

(28) a. Even John came to the party
b. He even helped tidy up afterwards (Yule, 1996, p. 45)

In the example (28), two events are presented. The presence of "even" in the examples offers an additional interpretation of the events: the fact that John went to the party and helped to tidy up are surprising events from the speaker's point of view, since it is something that goes against his/her expectation. The conjunction "and" carries different conventional implicatures. Consider the following examples:

(29) a. Yesterday Mary was happy and ready to work.

b. (*p & q, +> p plus q*) (Yule, 1996, p. 46)

The first conventional implicature attached to the conjunction "and" is exemplified in (29). As a matter of fact, when two statements containing static information are connected with "and" as in (29), the implicature takes the meaning of "plus" or "in addition".

(30) a. She put on her clothes and left the house.
b. (*p & q*, *+> p after p*) (Yule, 1996, p. 46)

The second conventional implicature attached to the conjunction "and" is represented in (30). When two statements containing dynamic information are joined together by "and", the implicature created is "and then" and it indicates a sequence. Another thing that can be noticed is that the two conjunctions of (29a) can be exchanged without a huge difference in meaning, whereas if the two conjunctions in (30a) are reversed, there will be a big change in meaning (Yule, 1996).

According to Grice's distinguishing properties (cancellability, non-detachability, calculability and non-conventionality), conventional implicatures are not cancellable since the contents of the utterance in which they occur are grammatically encoded and hence they are generated by the conventional meaning of some of the words used in the utterance (Blome-Tillman, 2012). Conventional implicatures are detachable because they depend on the specific lexical items used in the utterance: for instance, if in (27a) "but" is replaced with "and", the conventional implicature will be lost, but the truth-conditions of the utterance will be preserved. In fact, conventional implicatures are characterized for being conventional meanings that do not affect the truth-conditions of the utterance to which they are linked to (Labinaz, 2012). Last, conventional implicatures are not calculable through pragmatic principles or contextual knowledge since, as stated before, they are conventional meanings (Levinson, 1983).

LANGUAGE ACQUISITION IN MONOLINGUALS AND BILINGUALS

2.1 Introduction

The debate on language acquisition has affected several areas of research over the years, so much that different disciplines have become interested in the subject, such as Philosophy, Psychology, Linguistics, Psycholinguistics, Anthropology, Speech Pathology, Education, but also Neuro and Cognitive sciences. The growing interest in the topic has led numerous scholars to investigate the human language and the human mind in order to understand how the fascinating process of acquisition of a language works. The study of language acquisition aims to investigate how children break into a language, how the knowledge of language emerges in early infancy and how the learning process works. Several theories have emerged over the years aiming at explaining the mechanisms involved in the process of acquiring a language. In section 2.1 the most influential theories of language acquisition will be explained, in section 2.2 the discussion will focus on the main stages of acquisition of a native language and the last section of this chapter will focus on bilingualism (and multilingualism), more specifically on the process of acquisition of two or more native languages.

2.2 Theories of language acquisition

The debate on language acquisition has revolved for a long time around two opposing concepts: nativism and learnability (Bavin, 2009).

Until 1960, the dominant approach was the behaviourist approach. According to the behaviourist approach, language is acquired through imitation or through the reinforcement of inputs and outputs. Nowadays, behaviourism is considered outdated since new studies have emerged in the field, but it is important to mention it for its historical value (Guasti, 2007). In 1957 Burrhus Frederic Skinner (1904-1990) published a book called “Verbal Behaviour”, which represents the most complete expression of behaviourism. Skinner was initially known for his contributions to the study of animal behaviour, but after many years in laboratories studying animals like rats and pigeons, he believed that his methods could have been extended also to human

beings (Chomsky, 1980). In his analysis of verbal behaviour, Skinner sought to identify the variables that control this behaviour and to explain how these variables then interact to produce verbal responses. Skinner's experiments consisted in placing a rat or a pigeon in a box with a bar attached to one wall in such a way that when the bar is pressed, the animal will obtain food (Chomsky, 1980). A hungry rat or pigeon will accidentally press the bar and it will obtain food. Every time the animal will press the bar, it will obtain food. In doing so, a reinforcement between a stimulus (the fact of being hungry) and a response (the fact of obtaining food pressing the bar) will take place. The rat or pigeon shows that it has learnt when it presses the bar every time it feels hungry. According to Skinner, language is learned in a similar way: through the mechanism of reinforcement of the association between a stimulus and a response (Guasti, 2007). Behaviourists believe that children learn a language through positive or negative reinforcements given by adult speakers: children receive a positive reinforcement when he/she produces a correct utterance, whereas a negative reinforcement when they produce an incorrect utterance. Negative reinforcements will lead children to correct themselves and to improve their language skills. Skinner's theory has been largely criticized by linguists and scholars of the time, such as Chomsky (1959), for not taking in consideration one of the most fascinating aspects of language: creativity. In fact, children produce utterances that they have never heard before, thus it is not possible that these utterances are the result of a reinforcement between a stimulus and a response (Guasti, 2007). In addition, parents tend to pay more attention to the content rather than to the structure of the child's utterance:

(31) Child: Papà accompagni? (The Italian personal pronoun *mi* is missing)
"Dad, will you take (me)?"
Adult: Dove vuoi andare?
"Where do you want to go?" (Guasti, 2007, p. 51)

The example in (31) is a demonstration of the fact that the notion of reinforcement is not clear. The adult's answer may be interpreted as a positive reinforcement by the child since the adult understood the child's utterance and replies accordingly. However, the child's utterance is not correct from a grammatical point of view and if the child

interprets the adult's answer as a positive reinforcement, he/she might conclude that his/her utterance is correct, and he/she will never correct himself or herself. It is possible to conclude that the stimulus-response mechanism does not explain how language acquisition works. According to the fact that children produce utterances they have never heard before, it is possible to conclude also that the mechanism of imitation does not explain the process of language acquisition. As a matter of fact, children not only produce utterances they have never heard before, but they also invent new words: English-speaking children say "goed" instead of "went", Italian-speaking children say "facete" instead of "fate" (the English verb make + Second Person Plural) (Guasti, 2002, p. 3). These expressions are not used by adults in conversations, so children cannot produce them by imitation, they are rather produced thanks to learned rules (Guasti, 2007).

From 1960s, another theory, pioneered by Noam Chomsky (1928), has emerged. According to Chomsky's theory, language acquisition is possible thanks to the existence of an innate linguistic knowledge (Bavin, 2009). Chomsky considers language as a biologically determined capacity in human beings: they are not only predisposed to language acquisition, but they also have a genetic endowment that allows them to acquire language. This genetic endowment is the concept of Universal Grammar. It is important to point out that the term grammar is used to indicate a mental object, a cognitive system that allows human beings to acquire language, to comprehend and to produce an indefinite number of utterances starting from a finite number of elements. In addition, the Universal Grammar allows human beings to associate certain linguistic forms to certain meanings. As it can be seen, the theory of innatism does not consider grammar as a set of prescriptive rules, but rather as a set of abstract knowledge and procedures that specify the particular form of linguistic rules. According to this theory, syntactic categories are innate (Bavin, 2009).

In 1965 Noam Chomsky published a book called "Aspects of the theory of syntax" in which the author advances the theory of generative grammar, also known as standard theory, which is characterized by the research of the innate structures of languages. Within the theory of generative grammar, in the late 1970s and early 1980s Chomsky proposed the Principles and Parameters theory. The Principle and Parameters theory has been proposed as a solution for the debated issue on language acquisition, since it

assumes that human beings are endowed with a Universal Grammar that is composed of a universal component that symbolizes all the common features of languages (principles) and of a component that symbolizes all the possible variables in human languages (parameters):

- Principles are the universal base of all languages, they are syntactic principles or structures that appear in every language (Bavin, 2009). For example, "every language possesses grammatical categories, such as noun, verb, adjective" (Guasti, 2007, p. 55),
- Parameters encode the properties that vary from one language to another. The child's task, over the course of language development, is to choose which value of each parameter characterizes his/her language (Bavin, 2009). An example of parameter is the "pro-drop or null subject parameter" (Guasti, 2002, p. 18): in languages such as Italian and Spanish the subject can be omitted, whereas in languages such as English and German the subject cannot be omitted.

Chomsky's theory of innatism has been originally motivated by the logical argument of the poverty of stimulus. The concepts behind the poverty of stimulus can be summarized as follows (Guasti, 2007, pp. 57-58):

a) Speakers have certain abstract linguistic knowledge.
b) Linguistic knowledge:
    I. cannot be assumed from the input,
    II. is not explicitly taught.
c) The input that children receive is often degenerated: children do not always hear well-formed sentences.
d) Children do not always receive negative evidence. This means that children are not always corrected when they make mistakes.
e) If one assumes that inputs are the only source of information for children, it is not possible to understand how they acquire language.

f) Inputs are not the only information contributing to the process of language acquisition, the Universal Grammar is also involved in the process.

The poverty of stimulus' argument starts with the assumption that all speakers know abstract properties of a given language, that those properties cannot derive from available evidence and are not explicitly taught by someone. The speakers' linguistic knowledge allows them to establish whether a sentence is acceptable in their language or not:

(32) Dog a old bone ate (Guasti, 2002, p. 6).

As the example above shows, the sentence in (32) is comprehensible, but from a grammatical point of view it is not acceptable in English. Consider (33):

(33) a. John kept the car in the garage.
b. The car that John kept was the one in the garage.
c. The garage was where John kept the garage (Guasti, 2002, p. 6).

The sentence in (33a) is ambiguous since it can be interpreted both as (33b) or (33c). The interpretation of (33b) means that, among the things available, John kept the car that was in the garage; the interpretation of (33c) means that the garage is the place where John kept the car. Human beings have the resources to deal with ambiguous sentence. In fact, "our Universal Grammar assigns certain structural representations to sentences, it accepts certain interpretations while banning others" (Guasti, 2002, p. 8).

As illustrated before in (31), parents tend to pay more attention to content rather than to the structure of the child's utterance, so they do not always correct wrong utterances and when they do, it is not a guarantee of the fact that children will comprehend and take advantages from adults' corrections. Additionally, the input children are exposed to is often degenerated: this means that the input includes incomplete or run-on sentences, ungrammaticalities, repetitions, exaggerations (Bavin, 2009). The language with which adults speak to children is referred to as "motherese" or "Child Direct Speech" (Guasti, 2007, p. 37).

Another argument in favour of the concept of poverty of stimulus is that there are cases in which children, starting from an impoverished input, succeed in surpassing the

initial linguistic model. This is the case of Simon, a 7-year-old deaf child born to deaf parents (Singleton, Newport, 2004). Simon's parents learned American Sign Language (ASL) during adolescence and did not use it fluently. The only input to which Simon was exposed, was a rudimentary linguistic input: his parents avoided complex structures and often omitted function morphemes. Simon's sign language has been compared with the one of other deaf children exposed to sign language from birth and born to deaf parents who used ASL fluently. The results showed that Simon's language was more consistent than the one of his parents and that it was very similar to the one of his peers, who were learning ASL from their native parents. These results suggest that despite of the impoverished input, Simon achieved a more refined competence than his parents: he acquired a sign language that included complex structures and function morphemes. Children have the capacity to organize linguistic data and they are sensitive to regular and systematic features of the input. Once they have learned these features, they use them to create complex syntactic structures that might not be present in the initial model.

Lastly, language acquisition is possible despite all limitations and variations in the learning conditions. The presence of an innate linguistic content also explains the similarities in the time course and content of language acquisition: language is acquired and proceed in the same way across languages and modalities (Guasti, 2002).

Innate behaviours are characterized by the existence of critical periods. Critical periods are periods in which the ability to acquire a competence reaches its maximum and after which that ability decreases. Lennenberg in his book called "Biological foundations of language" (1967), suggested that language can develop fully only if it is acquired before puberty. This assumption was based on evidence from studies on children deprived of social and linguistic interaction during childhood (Curtiss, 1977): a girl known as Genie was deprived of social and linguistic interaction until the age of 13. Even after several years of linguistic rehabilitation, Genie's language abilities were equal to those of a 2-year-old child. She acquired limited language abilities, especially in syntax. All human beings are endowed with an innate linguistic knowledge, but its full and natural development depends on the exposure to stimuli during a specific time in life.

To sum up, according to innatism, the Universal Grammar guides children in the process of language acquisition and the acquisition is also the result of the interaction between an inborn component and the environment (Guasti, 2007).

Nowadays the debate on language acquisition remains lively between innatism on one hand and emergentist and usage-based theories on the other hand.

According to the emergentist theory, syntactic principles cannot be found in physical stimulus, nor are they encoded in human DNA. In the emergentist perspective, "syntactic principles emerge from relatively simple developmental processes being exposed to a complex environment" (Ellis, 1998, pp. 643-644): humans must cope with the need of communicating a wide repertoire of meanings with a limited cognitive system. Language acquisition is possible thanks to general cognitive principles that operate both in the development of pre-linguistic communication and linguistic communication. It is believed that there is a continuity between the pre-linguistic and linguistic communication, but also between the acquisition of lexicon and the acquisition of syntax. Emergentists assume that the emergence of syntax and lexicon are connected. As a matter of fact, recent studies (Bates et al., 1995) have shown that children possessing a wide vocabulary are the first to combine words.

According to the usage-based theory, pioneered by Michael Tomasello (1950), children come to the process of language acquisition equipped with two sets of cognitive skills, both evolved from other more general mechanisms that also exist in other species and that are also involved in non-linguistics functions:

- Intention-reading (functional dimension)
- Pattern-finding (grammatical dimension)

Intention-reading represents "what children must do to discern the intentions of adult speakers when they use linguistic forms to achieve social ends, and thereby to learn these forms from them" (Bavin, 2009, pp. 69-70). Children initially learn specific communicative intentions by imitation: for example, "Give me the ball" (Guasti, 2007, p. 52). During the process of lexical acquisition children use intention-reading to understand the speaker's intentions in order to figure out the referent intended by the speaker. During the process of acquisition of utterances children use intention-reading

to understand the function of utterances: the preceding example ("Give me the ball") can be interpreted as a command or a request.

Pattern-finding represents "what children must do to go productively beyond utterances they hear people using around them to create abstract linguistic schemas or constructions" (Bavin, 2009, p. 70). During this process, children might find useful to use analogy: they can create abstract linguistic schemas, such as "Give me X" starting from "Give me the doll" or "Give me the apple" (Guasti, 2007, p. 53). According to this theory, language acquisition starts from the acquisition of isolated expressions used in specific contexts from which children extract regularities that lead them to build an abstract linguistic knowledge. Thus, children before 3-4 years of age acquire a language based on concrete schemas from which they can extract abstract linguistic schemas or constructions. According to the usage-based theory, there is not a specific inborn linguistic capacity: there are other general innate mechanisms that are used both in the process of language acquisition and in the process of acquisition of other abilities (Guasti, 2007).

At the moment, the most accepted theory is the theory of innatism proposed by Chomsky. Many scholars and linguists have embraced innatism and adopted this theory in their books and studies on language acquisition. The acceptance of such a theory has raised an important issue: if language is an inborn human capacity, it must have a precise collocation in the human brain. Many studies on the human brain have been conducted and these studies have revealed that language is lateralized in the left hemisphere of the brain. In the second half of the nineteenth century, a French doctor called Paul Broca and a German neuropsychiatrist called Carl Wernicke conducted studies on adults who have suffered brain damages (Adornetti, 2019).

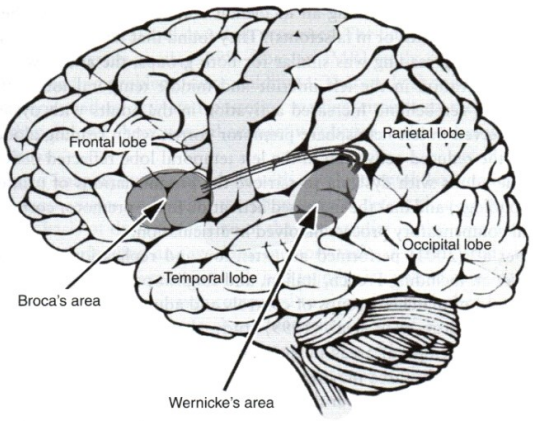

Figure 2.1 Schematic diagram showing the major lobes of the brain and more specifically Broca's and Wernicke's area.

Hulme C., Snowling, J.M., (2009). Developmental Disorders of Language Learning and Cognition, United Kingdom, Wiley-Blackwell, p. 77

Paul Broca discovered the localization of articulated language: the Broca's area, named after the French doctor, is located in left frontal lobe, as it can be seen in the image above. Damages to this area typically result in problems in speech production (Hulme and Snowling, 2009). Carl Wernicke discovered the localization of speech comprehension: the Wernicke's area is located in the left temporal lobe, behind Broca's area. Damages to this area result in problems with speech comprehension (Hulme and Snowling, 2009).

2.3 The acquisition of the native language

Chomsky's innovative proposals on language acquisition led numerous psychologists to investigate the infant "initial state", that is to say, the infants' abilities at birth. Infants are sensitive to language immediately after birth and recent studies have shown that they perceive some aspects of language already in the womb. Foetuses' hearing system is already developed at 35 weeks of gestation, as demonstrated by studies on foetuses and preterm infants (Guasti, 2007). At around 35-36 weeks of gestation, foetuses can hear their mother's voice filtered in the amniotic fluid and they detect changes in auditory stimuli: a study conducted by Lecanuet and Granier-Deferre in 1993 consisted in placing a loudspeaker on the mother's abdomen and to first habituate foetuses to an auditory stimulus (e.g. the sequence *babi*). The sequence was repeated several times, but then in the dishabituation phase, only foetuses exposed to a new stimulus (e.g. *biba*) exhibited a decelerative heart rate response. It has been also

demonstrated that 1- to 3-day-old infants prefer to listen to their mother's voice and familiar stimuli. Additionally, researchers have demonstrated that infants discriminate between languages and not between voices: at 4 days of life infants can discriminate their native language from a nonnative one. They can do so even when they are not familiar with the speaker's voice, which proves that they are discriminating between languages and not between voices (Guasti, 2016). More recent studies conducted on infants in their first days of life, have shown that they can also discriminate between two nonnative languages they have never heard before (Guasti, 2016). How can infants discriminate between languages if they do not know anything specific about languages? It has been demonstrated that infants discriminate between their native language and a nonnative one and between two nonnative languages relying on prosodic information, which includes rhythmic structures, intonation, stress, syllables. Several studies have been conducted on infants in their first days of life aiming at explaining how newborns discriminate between languages. These studies followed the technique of the study pioneered by Mehler et al. (1988): the high-amplitude sucking procedure (HAS), a procedure that exploits infants' sucking behaviour. During these experiments using the HAS, infants suck on a pacifier that is linked to a pressure transducer connected to a computer. In doing so, the sucking rate is measurable. Experiments using HAS start by measuring infants' sucking rate in the absence of any stimulation in order to define infants' baseline, then the habituation phase starts. During this phase linguistic stimuli are presented. When infants have heard the same stimulus for a certain amount of time, they become used to that stimulus and they start to suck less. Since infants become habituated to that stimulus, the experimental phase starts. In the experimental phase infants are presented with one or two conditions: experimental and control condition. In the experimental condition infants are presented with new stimuli, whereas in the control condition they continue to hear the stimuli they have previously heard during the habituation phase. To understand if infants discriminate between the stimuli they hear, the sucking rate of the experimental group and of the control group must be compared. If infants in the experimental group detect the change of stimulus, they should suck more than the infants in the control group (Guasti, 2002). Mehler et al. in 1988 carried out an experiment using HAS on infants exposed to French. In the habituation phase infants from both the control and the experimental group were exposed to Russian

utterances. When the experimental phase started, the control group continued to hear Russian utterances, whereas the experimental group was presented with French utterances. In the habituation phase, the sucking rate of the two groups was identical, whereas in the experimental phase the sucking rate of the experimental group changed, demonstrating that this group detected the change. Mehler et al. (1996) proposed that infants discriminate between languages on the base of rhythmic properties, suggesting a hypothesis known as Rhythm-Based Language Discrimination Hypothesis. As a matter of fact, languages can be divided into three rhythmic categories (Abercrombie, 1965):

- Stress-timed languages: for example Arabic, Dutch, English, Russian, Swedish
- Syllable-timed languages: for example Italian, French, Greek, Spanish, Mandarin
- Mora-timed languages: for example Japanese, Tamil

"In stress-timed languages, listeners perceive a regular recurrence of stress, in syllable-timed languages a regular recurrence of syllables, and in mora-timed languages a regular occurrence of morae" (Guasti, 2002, p. 34). The notion of mora is typical of the Japanese language and has been defined by McCawley as "a unit of phonological distance, something of which a long syllable consists of two and a short syllable consists of one" (1968, pp. 133-134). According to the rhythm-based language discrimination hypothesis, infants classify languages within rhythmic classes, discriminating between languages belonging to different rhythmic classes, but not between languages belonging to the same rhythmic class. A confirmation of this hypothesis comes from a study conducted by Nazzi, Bertoncini and Mehler (1998) on 4-day-old infants exposed to a French-speaking environment. In this experiment utterances were drawn from four languages: two syllable-timed languages (Italian and Spanish) and two stress-timed languages (English and Dutch). French infants were assigned to one of the two groups. The rhythmic group was habituated to a combination of sentences from languages of the same rhythmic class (Italian/Spanish or English/Dutch), whereas the nonrhythmic group was habituated to a combination of sentences from languages of different rhythmic classes (English/Italian or Dutch/Spanish). Once the experimental phase started, the infants of the rhythmic group

were presented to languages belonging to a different rhythmic class (for example, if they first heard Italian/Spanish, then they heard Dutch/English), whereas the nonrhythmic group was presented with new stimuli, but sentences were taken from languages belonging to the same rhythmic classes of the languages in the habituation phase (for example, if they first heard English/Italian, then they heard Dutch/Spanish). After the stimulus changed, infants in the rhythmic group started to suck more than the infants in the nonrhythmic group. As a result, it is possible to deduce that only the rhythmic group identified a change in the new stimuli. The nonrhythmic group also underwent a change in stimuli, as the languages in the habituation and experimental phases differed, but this did not result in a discrimination response. That being said, it is possible to conclude that infants discriminate between rhythmic classes and not between individual languages. This ability refines at around 5 months of age, age in which infants start to discriminate between their native language and languages belonging to the same rhythmic class (Garaffa, Sorace, Vender, 2020).

Languages differ from one another also according to the sounds that compose words of a given language. At around 5 months, infants can discriminate between sounds of their native language but also between sounds of languages they have never heard before: a study on infants of 6-8 months of age exposed to Japanese revealed that they can distinguish between /l/ and /r/ sounds. The opposition between /l/ and /r/ is not present in Japanese, in fact when Japanese native speakers speak in English or Italian, they find it difficult to pronounce the /r/ sound, thus they tend to use the /l/ sound instead. At 6-8 months old infants can still discriminate between native and nonnative contrasts, but this ability will completely disappear around 12 months (Tsushima et al., 1994). These findings favour the hypothesis that children are born with the ability to discriminate all possible contrasts, even those that are not present in the linguistic environment they are exposed to. Experience guides children to select, from the universal repertoire of sounds, those contrasts that are relevant and have a phonemic value in their native language (Guasti, 2002).

Even though speech perception is evident from birth, the actual speech production abilities arise at around 6 months. From birth to 4 months, the infants' oral tract resembles that of apes. At around 4 months infant's vocal apparatus drastically changes and start to resemble adults' vocal apparatus: one important change is the descent of the

larynx. With the descent of the larynx and other anatomical changes in the vocal tract, infants start to control the air pressure and can produce long episodes of phonation (Guasti, 2002). Infants' first vocalization consist of vegetative sounds, cries and isolated vowel-like and consonantal sounds.

At around 6-8 months of age, infants start to produce sounds similar to the one of proper language. This phenomenon is known as babbling. Babbling consists of a continuous repetition of syllables, such as [bababa] or [mamama]. Two types of babbling can be found: vocal and manual babbling.

Vocal Babbling is "a form of linguistic production characterized by syllabic organization, the use of sounds of natural languages and the absence of an associated meaning" (Guasti, 2016, p. 64). Two forms of babbling can be noticed: canonical and variegated. The former form consists of a repetition of the same syllable, usually a CV (C= consonant, V= vowel) sequence; the latter form consists of the repetition of various types of syllables, such as [badabada] or other syllables. These two forms of babbling do not correspond to two different stages, infants might produce both at the same time. When infants start to babble, their repertoire displays universal features. At around 8-10 months of age, infants' production of consonant and vowel sounds starts to be influenced by the surrounding environment, hence babbling starts to resemble the target language: infants are developing the adult phonological system of their language (Guasti, 2016). When hearing infants start vocal babbling, deaf infants exposed to sing language start manual babbling. Manual babbling presents the same features as vocal babbling: it has a syllabic organization, it presents a subset of signs used in sign languages that are used without an associated meaning. As vocal babbling, manual babbling presents two forms: canonical and variegated babbling (Guasti, 2016). Nowadays babbling is considered a fundamental step for the development of language: at the age of 10-12 months infants start to produce their first words while they are still babbling (Guasti, 2002).

Children start to produce their first words at around 12 months of age and the process starts with invented words (words invented by toddlers with a fixed meaning, used to refer to the same object). Together with invented words, words connected to the context can arise (words that might resemble real words and that might be understood by parents, but that are used only in specific circumstances). Real words arise when

these are used to refer to the same object, they have an adult-like sound, they are used in different contexts with a specific communicative intention (Guasti, 2007). When toddlers start to produce real words, it will take them few months to expand their vocabulary.

At around 18-24 months of age, toddlers' vocabulary rapidly expands so much that it is possible to talk about a vocabulary spurt, a phase in which toddlers learn from 5 to 9 words a day (Guasti, 2007). The acquisition of lexicon involves different abilities, such as understanding the external world, the social and linguistic context. The first infants' task during the acquisition of lexicon is to associate a word with a referent representing a "word-to-world mapping procedure" (Guasti, 2016, p. 93). This procedure is not sufficient for the acquisition of the whole lexicon, for example the meaning of abstract objects cannot be observed in a physical context. Additionally, a single word may be associated with different meanings, so it is not possible to retrieve the correct meaning of words only by relying on the extralinguistic context. A study carried out by Baldwin (1991) has shown that 18-months-old infants use the direction of the speaker's gaze to identify the speaker's focus of attention when uttering a word or sentence. This gives toddlers a great advantage: it guides them to understand what the speaker is referring to, thus to a correct association between a word and its meaning; it also helps them to avoid incorrect association (Guasti, 2016). Nonverbal cues may not always be available or sufficient, in fact other factors contribute to the word-learning process: biases on word meaning. These biases facilitate children in the acquisition of lexicon by favouring certain kinds of assumptions over others. The concept of bias was proposed by Ellen Markman in 1994 and she introduced three types of biases: whole object bias, taxonomic bias and mutual exclusivity bias.

(34) Whole object bias: "A novel label is likely to refer to the whole object and not to its parts, substance, or other properties." (Markman, 1994, p. 155)

The whole object bias leads toddlers to assume that "a new word refers to a whole object rather than to a part, substance, colour it is made" (Markman, 1994, p. 215). According to this, when children hear the word "cat" they assume that it refers to the whole animal rather than the cat's parts of the body, such as tail or paws (Guasti, 2016,

p. 96). Once children understood that a label refers to a whole object, they must figure out how to extend it to other objects: the taxonomic bias helps them to identify taxonomically related objects.

(35) Taxonomic bias: “Labels refer to objects of the same kind rather than to objects that are thematically related.” (Markman, 1994, p. 155)

Two objects are thematically related if they are connected by some relations, such as temporal, spatial, causal relations; whereas two objects are taxonomically related if they belong to the same category: cats and dogs belong to the category of animals, trucks and buses belong to the category of vehicles (Guasti, 2016). Sometimes children tend to overextend words, they might use the word “ball” to refer to a ball, but also to similar shape objects, such as an apple. Since overextension is only present in production and not in comprehension, this means that children know that “ball” stands for balls and not for other objects. It is believed that overextension is a lexical strategy that children use when they do not know or cannot retrieve the correct word. As a matter of fact, children assume that each object has its own label, that is Mutual exclusivity bias.

(36) “Words are mutually exclusive… Each object will have one and only one label” (Markman, 1994, p. 163)

The mutual exclusivity bias leads toddlers to “prefer only one label for an object” (Markman, 1994, p. 218), that is, one object will have one and only one label. In fact, if children hear a new word in presence of an object, they first assume that the new word refers to the whole object, but if the latter already has a label, they therefore imply - guided by the mutual exclusivity bias - that the new word describes the material or a part of the object or an unknown object (Guasti, 2016).

When children experience a vocabulary spurt (18-24 months) they also start to combine words. They begin with holophrases: for example, they say “milk” to express a complex idea, such as “I want milk” or “I am drinking milk” (Guasti, 2007, p. 131), then they start to combine more words and to produce longer phrases. Words are combined without the use of articles, conjunctions and complex verbal forms, in fact

child language is similar to telegraphic language, in which information is condensed in few words.

At 30-36 months of age the first morphosyntactic abilities arise. In this phase children overregularize: they apply syntactic rules also to irregular forms, such as "goed" instead of "went", "facete" instead of "fate" (Guasti, 2007, p. 143).

At around 3-4 years of age, language is generally structured in all its aspects: sentences are generally well-formed, more complex and structured, children have acquired a wide vocabulary and a good sound production.

2.4 Bilingual acquisition

The term *bilingualism* or *multilingualism* is surrounded by various myths and false beliefs, starting with the idea that exposing children to more languages will confuse them and will not enable them to distinguish the languages they are exposed to. More and more researchers have become interested in the topic, showing with their studies that more than half of the word population is bilingual. The European Commission report published in April 2019 showed that 64% of the working population (aged 25-64) living in the European Unition speaks at least one additional language, 21% of this group speaks two additional languages and 8% of this group speaks three or more languages.

The term *bilingualism* (or *multilingualism*) refers to any real-life situation in which two or more languages (or dialects) are used regardless of the level of fluency. As a matter of fact, a common misconception is that bilinguals achieve the same level of fluency in all the languages they are exposed to. One can consider himself bilingual even when there is one dominant language and the other one is used only "for different purposes, in different domains of life or to accomplish different things" (Grosjean and Li, 2012, p. 7). The term "bilingual" also refers to adults who acquire a second or a third language during adolescence or adulthood (Garaffa, Sorace and Vender, 2020). In order to define the term bilingualism, it is important to introduce the concept of "age of acquisition", thus the moment in which a person starts getting exposed to a language. A first distinction is between the term *bilingualism* or *simultaneous bilingualism* and *early second language*. The former terms are used to describe the condition in which two or more languages are acquired from birth or simultaneously, the latter term is used to

describe a condition in which one language is acquired from birth and another shortly after. The second condition can also be described as "*successive or sequential bilingualism"* (Guasti, 2016, p. 430).

Bilingual acquisition can take place under different circumstances (Guasti, 2007, p. 249):

1. One person-one language: the father speaks one language and the mother speaks another language,
2. One language-one environment: the father and the mother speak one language, whereas in the extra-familiar environment a different language is spoken.

In the first circumstance, the language spoken by one of the parents may or may not be the language spoken in the extra-familiar environment. If it is also spoken in the extra-familiar environment, the child may be more exposed to it, thus one language will be more dominant than the other. The circumstance described in the second point takes place when both parents speak one language that differs from the one spoken in the extra-familiar environment. These variables concerning the circumstances in which children acquire two or more languages do not affect children's linguistic abilities.

In section 2.2 it has already been presented the fact that infants can discriminate from birth between pairs of languages, which are either the native language and a foreign one, or both nonnative languages. This ability is particularly important in bilingual-to-be infants. Byers-Heinlein, Burns and Wecker (2010) carried out a study on newborns (0-5 days) exposed to a bilingual Talog-English environment and a monolingual English environment. The study revealed that both bilingual and monolingual newborns were able to discriminate Talog from English. Since Talog is a syllable-timed language and English a stress-timed language, the study's findings are in line with the Rhythm-Based Language Discrimination Hypothesis.

Bosch and Sebastián-Gallés (2001) conducted a language discrimination study on bilingual infants exposed to Spanish and Catalan from birth showing that they can discriminate between two native languages belonging to the same rhythmic class already at 4 months of age and that they do not prefer one over the other since they both are native languages for them. Bilingual infants are also able to discriminate between

the two native languages and a nonnative one, just like monolinguals (Bosch and Sebastián-Gallés, 2010). Moreover, this study has suggested that, unlike monolinguals, bilingual-to-be infants prefer a nonnative language over the native ones. These findings prove that bilinguals are not confused and that are able to distinguish the two linguistic systems. As bilingual infants can separate their two native languages at birth, it is evident that they have no disadvantages compared to monolinguals.

There are no disadvantages also in their first linguistic productions: at around 6 months of age there are the first appearances of babbling also in bilingual infants (Garaffa, Sorace and Vender, 2020). A study by Maneva and Genessee (2002) conducted on a bilingual infant born to a French-speaking dad and an English-speaking mum, who both speak with him in their respective languages, revealed that the infant's babbling, examined from his 10 to 15 months, presented different features depending on the language of the interlocutor: it took on features of French when the child was interacting with his dad, whereas it took on features of English when the child was interacting with his mum. This study proves that bilingual infants can distinguish the two linguistic codes at an early age.

Even though bilinguals distinguish between the two linguistic codes already before their first words, sometimes they tend to mix languages. This phenomenon is called *code-mixing*. Initially, researchers claimed that bilingual children were confused based on the fact that they mix languages. For example, they start a sentence in a language and they finish it in another language. Recent studies have demonstrated that code-mixing follows specific linguistic and environmental rules in the bilingual brain: a study conducted by Gennesee and collaborators (1995), showed that bilinguals adapt their languages according to the interlocutor. The study consisted in manipulating the quantity of mixing in an experiment in which a child was speaking to a bilingual adult. The bilingual adult could show a high or low quantity of language mixing. The results showed that the child adapted to the communicative situation: when the adult showed a low quantity of mixing, the child did the same and when the adult showed a high quantity of mixing, the child did the same. Code-mixing represents an important feature for the bilingual linguistic community and it is often used as a strategy for retrieving unknown words (Guasti, 2007).

As monolinguals, bilinguals start to produce their first words at around 12 months of age, maintaining levels of vocabulary development similar to those of monolinguals (Garaffa, Sorace and Vender, 2020). However, some studies analysing the production of words, such as the one conducted by Pearson, Fernández and Oller (1993), have observed a lexical specialization in one of the two languages spoken by bilingual toddlers. The productive lexicon was less developed than the one of monolingual toddlers when considering both languages separately. The study revealed also that the whole lexicon obtained by putting together the two languages, was equal to the one of monolinguals. These findings suggest that the vocabulary of a bilingual person develops according to his/her individual needs. In fact, Grosjean stated that (2012, p. 12):

> "Bilinguals usually acquire and use their languages for different purposes, in different domains of life, with different people. Different aspects of life often require different languages."

Grosjean's words explain the concept of the Complementarity of Principle. Every bilingual person uses his/her languages for different purposes and in different domains of life, as a result each language will be more or less specialized than the other for each of these domains. The Complementarity Principle can also explain the phenomenon of language dominance: the more domains a language covers, the greater fluency a person will have in that language; when a language is used in few domains, it will be less used and the person will be less fluent in that language (Grosjean, 2012). Let us consider the case of an Italian native speaker who uses English for work purposes: his/her vocabulary related to the professional field will be rich, so much that he/she will find it difficult to translate a specific term in Italian. On the contrary, it may happen that he/she does not know a term in English connected to the family domain since he/she does not use English frequently in that environment (Garaffa, Sorace and Vender, 2020).

It is important to point out that the phenomenon of language dominance is a dynamic phenomenon since it can change over time. For instance, over the course of life, the second language may become dominant and cause changes in the first language.

In their everyday life, bilinguals find themselves in situations in which they must decide which of their languages should be brought in. When they are speaking to

monolinguals, bilinguals deactivate one of their languages and adopt the language of the interlocutor. This is called “monolingual speech mode” (Grosjean, 1989, p. 9). When they are speaking to bilinguals, all languages are activated. Bilinguals have to choose a “base language” to use with their interlocutor and then they mix it with the other languages when needed (Grosjean, 1989). The choice of the base language depends on factors, such as the situation, the participants, the topic, the function of the interaction (Grosjean, 1989).

When in monolingual speech mode, a total deactivation is rarely possible, in fact bilinguals produce interferences (or transfers). There are static interferences and dynamic interferences. Static interferences represent permanent traces of one language on another one, an example of static interference might be a “foreign accent” (Grosjean, 2012, p. 21). Dynamic interferences are accidental intrusions of one language on another one, for example “the accidental slip on the stress pattern of a word because of the stress rules of the other language” or “the one-time use of a word from the other language that is produced according to the phonetic patterns of the base language” (Grosjean, 2012, p. 21). Interferences can occur at all levels and modalities of language.

When they are in bilingual speech mode and once a base language has been chosen, bilinguals can mix languages in different ways: trough code-switching or borrowing.

Code-switching is the alternate use of two languages that may involve words, phrases or sentences (Grosjean, 2012):

(37) But I wanted to fight her *con los puños*, you know
“But I wanted to fight her with my fists, you know” (Grosjean, 2012, p. 19)

The example in (34) is an example of code-switching in which the base language is English and the “guest” language is Spanish.

Borrowing is “the integration of one language into another” (Grosjean, 2012, p. 18). Two types of borrowing can be found: loanword and loanshift. Loanword is a situation in which both the form and the content of words are borrowed. In the following example the English word “code-switch” has been integrated into a French sentence:

(38) Ca m’étonnerait qu’on ait *code-schwitché* autant que ça

"I can't believe we code-switched as often as that" (Grosjean, 2012, p. 19).

Loanshift is a situation in which a word taken from a given base language extends or changes its meaning under the influence of a foreign language: for example the use of the Portuguese word "humoroso" by Portuguese-American bilinguals to mean "humorous" when the original meaning was "capricious" or the use of idiomatic expressions translated literally, such as "I put myself to think about it" said by Spanish-English bilingual based on the Spanish expression "Me puse a pensar" (Grosjean, 2012, p. 20).

THE EMERGENCE OF PRAGMATICS

3.1 Introduction

The process of language acquisition does not only include learning phonology, syntax and semantics, as to be a competent language user also means knowing how to use language appropriately in a given social context. In fact, children need to learn how to make their language work in interactions with different interlocutors, such as with their family members, friends, teachers, peers and others. A wide range of competences are involved in pragmatics because human beings use language for many different purposes: children need to learn to ask questions, give orders, make requests, tell stories. "Children must learn to initiate, maintain and conclude a conversation" (Bavin, 2009, p. 339). They must learn how to take turns and how the meaning of terms, such as *I*, *you*, *here* and *there* varies according to who is speaking and who is listening. Additionally, in some cultures, children must learn informal and formal pronouns, such as *du*/*Sie* in German or *tú*/*Ustedes* in Spanish. Moreover, children need to learn that sometimes what a speaker says is not always what he/she meant, since utterances can carry non-literal meanings. These are just few examples indicating that children must learn to be sensitive to who they are speaking to and to the contextual situation in which they are communicating (Bavin, 2009).

In comparison with the other levels of language, pragmatics has always been considered the most difficult to define (see Chapter 1). It is certain though, that pragmatics is concerned with language in use. Given the fact that pragmatic behaviours are contextually sensitive, it is difficult to define and describe a clear developmental progression for each of them.

In more recent years, the field of experimental pragmatics has developed. Experimental pragmatics investigates the cognitive processes involved in the use of language (Domaneschi and Bambini, 2022). One of the topics of interest of this field is the acquisition of scalar implicatures.

In section 3.2 a brief description of some of the first aspects of pragmatics acquired by children will be offered. Furthermore, section 3.2 will focus on the acquisition of scalar implicatures by monolingual children by presenting three experimental studies on

children (Noveck, 2001, Guasti et al., 2005, Foppolo et al., 2012). The last section of this chapter will focus on the acquisition of scalar implicatures by bilingual children. The bilingual acquisition of scalar implicatures will be presented through three studies (Siegal et al., 2007, Antoniou and Katsos, 2017, Dupuy et al., 2018).

3.2 The acquisition of pragmatics in monolinguals

In section 3.1 pragmatics has been defined as "language in use", however human beings communicate also using nonverbal cues: we may accept a request with a smile or refuse something with a disdainful look (Airenti, 2017). Infants are able to communicate even before acquiring a language: they acquire pragmatic competences and show evidence of communicative intent during the course of their first year of life (Bavin, 2009). As a matter of fact, infants use gestures to communicate requests or refusals as well as their desire to draw the attention of others, even before they are able to produce and use words. Infants typically start to use gestures around 8-12 months of age, using them to direct attention to an object or themselves, but also to influence the mental states of others (Tomasello et al., 2007). Developmental psychologists refer to this phase as "preverbal stage" and they believe that during this stage children acquire the conditions of the most fundamental speech acts, focusing mainly on requests (Bruner, 1975, 1983).

Bruner (1975) argues that the acquisition of language is structured around pragmatic units that children have already acquired in a preverbal form, also supporting the idea that there is a continuity between the act of pointing and the formulation of a request through linguistic conventions. Two types of pointing can be found (Bates et al., 1975): the proto-declarative and the proto-imperative. The proto-declarative has been defined as "preverbal effort to direct the adult's attention to some event or object in the world" (Bates et al., 1975, p. 208), whereas the proto-imperative has been defined as "the child's intentional use of the listener as an agent or tool in achieving some end" (Bates et al., 1975, p. 208). These two types of pointing correspond to different speech acts: an example of proto-declarative may be "look!", whereas an example of proto-imperative may be "give me!" (Airenti, 2017, p. 5).

As it can be seen, many authors and scholars favour the hypothesis that, before acquiring a language, infants have already acquired some aspects of conversation, such as the functions of some basic speech acts. According to Bates (1976), the range of communicative functions children are able to express increases together with the development of their vocabulary.

There are some characteristics that define the format of conversation, one of them is turn-taking. It is believed that turn-taking is the first pragmatic feature acquired by infants: a study conducted by Trevarthen et al. (1999) analysing the exchanges between infants and adults showed that infants participate in interactions by coordinating their rhythm with the one of adults. It is thanks to this ability, that infants' behaviours, such as smiles and sounds, are perceived as proto-conversations, that is, first interactions between infants and adults (Bateson, 1975).

The ability of turn-taking is connected with the ability to establish joint attention. Joint attention refers to moments in which a child and an adult direct their attention to the same thing and in which both participants are aware that the focus of attention is mutually shared (Baldwin, 1995). This ability emerges in infants at around 6 months of age (Airenti, 2017).

The field of pragmatics is also concerned with the use of indexical expressions, whose referent changes according to the contexts in which they are uttered. Languages have a wide number of deictic forms and it will take several years before children can master all of these forms (Tanz, 1980). Nevertheless, some deictic forms start to be acquired in the first year of life: spatial deictic words, such as "here" and "there", arise in one-word and two-word utterances. Most children are able to use one or two deictic words by the age of 2.5 years, but the complete acquisition is accomplished around 5 years (Airenti, 2017).

The field of pragmatics is also concerned with the study of conversational implicatures. The notion of conversational implicature was introduced by Grice who claimed that what is said is only a small part of what the speaker intends to say and of what the hearer understands (see Chapter 1, section 1.4). As a matter of fact, Grice distinguishes between "sentence meaning" and "speaker meaning". The former is the grammatical meaning of a sentence, whereas the latter is the meaning the speaker intended to convey by uttering a sentence (Noveck and Reboul, 2008). According to the

Gricean point of view, linguistic communication cannot be reduced to an encoding-decoding process, since it also involves the attribution of mental states to the speaker: in order to retrieve the speaker's meaning, one has to attribute a special kind of intention to the speaker. The speaker's intention must also be recognized by an audience, since it aims at producing a cognitive effect in that audience (Noveck and Reboul, 2008).

As already mentioned in Chapter 1, section 1.4, Grice advanced a Theory of Conversation, in which he proposed that conversation is based on a Principle of Cooperation. The Cooperative Principle was explained through four maxims of conversation (Quality, Quantity, Relevance, Manner) that speakers are supposed to follow. Conversational implicatures result from an inferential process that is guided by the expectation that the speaker has followed the maxims (Noveck and Reboul, 2008).

From the beginning of the 2000s, the field of Experimental pragmatics gained more and more popularity. The term "Experimental pragmatics" was introduced by Dan Sperber and Ira Noveck (Sperber and Noveck, 2004). One of the topics of interest of Experimental pragmatics are scalar implicatures (see Chapter 1, section 1.4): utterances such as "I saw some of your children today" are often interpreted as "I didn't see all of your children today" (Noveck and Reboul, 2008, p. 426). This interpretation is due to the fact that if the speaker meant "all", he would have been more informative and would have said so. However, the semantic meaning of "some" is logically compatible with "all".

The linguistic Ira Noveck (2001) was one of the first who examined children's interpretations of scalar terms. In his paper, Noveck (2001) conducted three experiments, but in this section the focus will be on Experiment 3. In Experiment 3, Noveck tested children's interpretation of scalar terms using a Statement Evaluation Task. In this task, participants had to evaluate a series of sentences containing the quantifiers "some" and "all". Noveck found in his studies that children are more likely than adults to interpret weak scalar terms semantically and to consider them compatible with the stronger terms of a given scale. Experiment 3 investigates the quantifier "some" ("certain" in French, since the study has been conducted in French). Noveck's experiment is a follow-up of a study carried out by Smith (1980), who tested 4-7-year-olds and reported that they treat "some" as compatible with "all". Smith's experiment presented participants with a series of sentences, such as "Some elephants have trunks"

or “Some birds live in cages” (Noveck, 2001, p. 179). The former type of sentences was designed so that sentences would still be true even if “some” is replaced with “all”; in the latter type of sentence, the meaning of the sentence would not be true if the quantifier “some” is replaced with “all”. Smith reported that the participants of her experiment were not able to draw implicatures, since they responded affirmatively to pragmatic infelicitous sentences, like “Some elephants have trunks”, giving evidence that they perceive “some” as compatible with “all”.

Smith’s experiment was repeated by Noveck (2001), who also tested adults. Noveck tested thirty-one 8-year-olds, thirty 10-year-olds and fifteen adult native French speakers. The sentences used were based on three types of information (Noveck, 2001, p. 180):

- factually universal (that elephants have trunks is arguably best represented with the quantifier “all”),
- factually existential (that birds live in cages is arguably best represented with “some”),
- absurd (that stores are made of bubbles is arguably false with both kind of quantifiers).

The materials consisted in 30 sentences describing a relation, which can be represented as follows (Noveck, 2001, p. 180):

a. five absurd “all” sentences (e.g., all chairs tell time),
b. five true “all” sentences (e.g., all elephants have trunks),
c. five false “all” sentences (e.g., all dogs have spots),
d. five absurd “some” sentences (e.g., some stores are made of bubbles),
e. five true (and felicitous) “some” sentences (e.g., some giraffes have long necks).

First, it was explained to participants that they were going to be presented with a series of sentences and that they were simply asked to say whether they agreed or not with each of those sentences. Some participants were occasionally asked to explain their

answers. The results of this experiment showed that children answer adequately to the sentences with the quantifiers “some” and “all”, but that they tend to accept pragmatic infelicitous sentences (e.g. “Some giraffes have long necks”). In fact, adults’ rate of acceptance of infelicitous sentences is 41%, the 10-year-old group showed an acceptance rate of 85% and the 8-year-old group an acceptance rate of 89%. As the results reveal, children’s acceptance rate is significantly different from the one of adults; children seem to accept “some” as compatible with “all”, hence, to accept pragmatic infelicitous sentences. No difference was found between children and adults in the other statements, namely they all accepted correct statements and they rejected false statements. These results are in line with Smith’s results on 4-7-year-olds. One interpretation given by Noveck on his experimental findings is that 7- and 10-year-old are not capable of pragmatic inferencing since they stick to the logical meaning. Another interpretation explicitly proposed by Noveck (2001, p. 182) is that “pragmatic interpretations become evident subsequent to logical interpretations” because their derivation involves a more elaborated cognitive effort.

Guasti et al. (2005) assessed the ability of Italian-speaking children to understand sentences including the quantifiers “some” and “all” (Guasti et al., 2005, Experiment 1). Guasti et al. (2005) in their paper conducted four experiments. Experiment 1 is a partial replication of Noveck’s (2001) Experiment 3, as the two experiments differ from each other in the language employed (French/Italian), in the age-group tested and in the materials used. In Guasti et al.’s Experiment 1, only 7-year-old children were tested. Moreover, Noveck used two lists of statements whereas in Guasti et al.’s Experiment 1 the same sentence, for example “giraffes have long necks”, was presented with either the quantifier “some” or with the quantifier “all”. According to this, each participant heard only one kind of sentence. The participants of this experiment are eighteen 7-year-old children and nineteen adult native speakers of Italian. The materials were essentially the same as those employed by Noveck (2001, Experiment 3), but they were presented in Italian and, as mentioned before, some changes in lexical items were included. There were 15 sentences with “some” and 15 with “all” based on three types of information, just like in Noveck’s experiment: factually universal, factually existential and absurd. For each quantifier there were three sets of six different statements (Guasti et al., 2005, p. 675):

a. five absurd “some” sentences (e.g., some stores are made of bubbles)
b. five true (and felicitous) “some” sentences (e.g., some children are blond)
c. five true (but pragmatically under-informative) “some” sentences (e.g., some giraffes have long necks)
d. five absurd “all” sentences (e.g., all doors sing)
e. five true “all” sentences (e.g., all birds have wings)
f. five false “all” sentences (e.g., all birds live in cages)

As in Noveck’s Experiment 3, it was first explained to participants that they were going to be presented with a series of sentences and that they were asked to say whether they agreed with each statement or not. Some participants were occasionally asked to motivate their responses. The experiment’s results showed that children are more likely than adults to accept statements like “Some giraffes have long necks”: an 87% of children accepted these types of under-informative sentences, whereas only a 50% of adults accepted them. Children rejected the absurd “some” and “all” statements and when they were asked to explain their response, they motivated their rejection appropriately. They also accepted or rejected statements with “some” and “all” in felicitous conditions appropriately. In the few cases in which children rejected under-informative sentences, they motivated their answer with explanations very similar to the one of adults: for example, they pointed out that all giraffes have long necks, thus they evaluated if a given statement corresponded to a situation in the real world (Guasti et al., 2005).

In conclusion, it is possible to affirm that Guasti et al.’s Experiment 1 confirms Noveck’s (2001, Experiment 3) findings. Both experiments demonstrates that children are less likely than adults to draw inferences and that they rather tend to accept the logical meaning of “some” and “all”. However, it is important to mention the other experiments described in Guasti et al.’s paper (2005). In Experiment 2, Guasti et al. argue that the poor performance displayed by children is due to the fact that children may have failed to understand the experimental instructions, failing to understand that they were asked to judge the informativeness of statements and not only their truth or falsity. In Experiment 2, twenty-one Italian-speaking children aged 7 years were tested

using the same materials of Experiment 1. The difference between Experiment 1 and 2 is that in Experiment 2 some of the children had to participate in a training session before the actual experiment took place. During the training session, experimenters showed children four figures depicting different objects, such as a cook, a grape, a chair, and a cake. Together with the figures, experimenters also presented statements describing one of the objects in two different ways and asked children to choose the description that better described the figures. Each description was a true description of the object, but only one was more specific than the other: children were presented with descriptions, such as the terms "chair" and "piece of furniture" that were used to describe a chair (Guasti et al., 2005, p. 680). After the training session, children were presented with a series of statements and, as in Experiment 1, they were asked to say whether they agreed or not with those statements. Sometimes they were asked to explain their decisions. During the training session, all children selected the more restrictive term, such as "chair" instead of "piece of furniture". Guasti et al.'s Experiment 2 revealed that children who participated in the training session, rejected under-informative statement ("Some giraffes have long neck") to a much greater extent than children who did not participate in the training session. However, it is important to mention that the training session had a strong effect on some of the children, but not on all of them, since some of the children still accepted under-informative statements. The results of Guasti et al.'s Experiment 2 suggest that training helps 7-year-old children in the rejection of under-informative sentences, but that it does not influence all of them. Children, who, after the training session, rejected under-informative statements were also able to explain their choice: they explained that they disagree with "Some giraffes have long neck", saying that "All giraffes have long necks". Guasti et al. (2005) in their Experiment 3 wanted to see if the effects of the training session persist and help children to reject under-informative statements even if they are tested after some time after their first test. In fact, the children tested in Experiment 2 were tested after one week without repeating the training session. The procedures and materials used were basically the same, only the content of the statements was changed. The outcome of Experiment 3 is interesting: children who rejected under-informative sentences with the quantifier "some" after the training in Experiment 2, failed to do so when they were retested after one week without an additional training. The effects of training did not

persist on most children. These findings reveal that children's ability to reject under-informative statements is evident only when they receive a training session right before the experiment. Experiment 3 revealed also that even the children who displayed an adult-like behaviour after the training session in Experiment 2, when they did not receive a specific training, failed to reject infelicitous sentences. Moreover, these results suggested that the Statement Evaluation Task is a difficult task for children since it does not present them with contextual information and that, it is only when children take part in a training session, that they take into account the informativeness of statements. Guasti et al.'s Experiment 4 sought to understand how 7-year-old behave when they are presented with a different task: Truth Value Judgment Task. Fifteen 7-year-old children were asked to evaluate five statements including the quantifier "some", which were true, but infelicitous in the context provided: for example, the statement "Some monkeys are eating a biscuit" in a situation in which all monkeys were eating a biscuit (Guasti et al., 2005, p. 686). In this experiment, statements including "some" and "all" in felicitous conditions were excluded. Children were presented with stories using props and toys and at the end of each story a puppet had to said what happened in the story. Children had to evaluate the puppet's sentence, saying whether it was a correct or incorrect description of the story. For example, they heard a story in which five out of five soldiers were riding a horse and at the end of it the puppet said: "Some soldiers are riding a horse". The main findings of this last experiment are that children displayed an adult-like behaviour: they rejected critical statements 75% of the time, whereas adult rejection rate was 83%. As it can be seen, when a different task was used a dramatic change in children's responses has emerged (Guasti et al., 2005).

Another study devoted to the investigation of scalar implicatures in children is the one conducted by Foppolo et al. (2012). This study (Foppolo et al., 2012, Experiment 1) differs from the studies previously mentioned because it tested children from a different age group. As a matter of fact, in Foppolo et al.'s experiment children were in between 4 and 7 years old. Sixty-three Italian children aged 4-7 years were tested on their ability to calculate scalar implicatures associated with the quantifier "some". Children were divided by age in different groups: thirteen 4-year-old, twelve 5-year-old, twelve 6-year-old, fifteen 7-year-old and lastly twelve adults. Eleven children were later excluded from the experiment. Foppolo et al. (2012, Experiment 1) used a Truth Value Judgment

Task: experimenters showed children a series of short stories acted out with toys, at the end of each story a puppet had to describe what happened in one sentence. At this point, participants were asked to judge the accuracy of the puppet's description (Foppolo et al., 2012, p. 373). The experimental materials consisted of eleven stories, each followed by a sentence uttered by a puppet. Five of the puppet's sentences contained the quantifier "some". These sentences were logically true, but pragmatically infelicitous. An example is "Qualche puffo è andato in barca" [=Some Smurfs went on a boat], which is a sentence used in a context in which all smurfs went on a boat (Foppolo et al. 2012, p. 373). Participants were asked to judge the sentence of the puppet, saying whether the puppet said what happened "well" or "badly". If participants did not like the puppet's statement, they were asked to reformulate it. The results of this study are summarized in Figure 3.1, showing the rejection and acceptance rate of under-informative statements for each group:

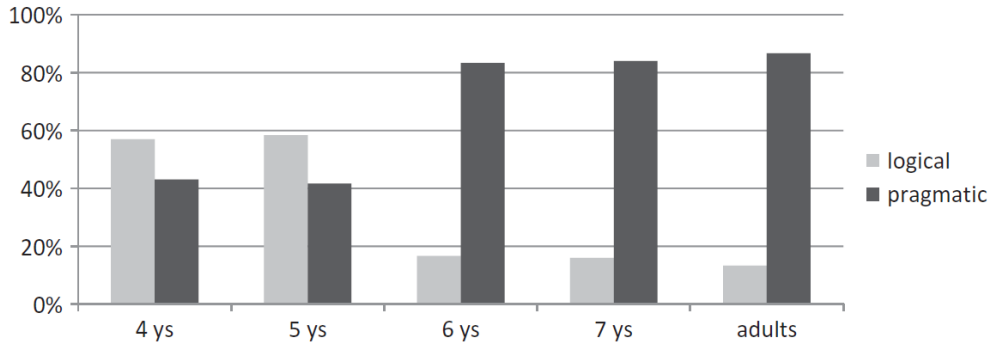

Figure 3.1 Percentages of logical and pragmatic answers in Foppolo et al.'s study on children aged from 4 to 7 years and adults

Foppolo, F., Guasti, M.T., & Chierchia, G. (2012). Scalar Implicatures in Child Language: Give Children a Chance, Language Learning and Development, 8(4), 365-394

It is immediately clear that both groups of 6- and 7-year-old behaved like the group of adults. However, both groups of 6- and 7-year-olds behaved differently from the younger groups (4- and-5-year-olds). The group of the 4- and 5-year-old children rejected the critical statements 43% and 42% of the time respectively, whereas 6- and 7-year-olds and adults rejected the critical statements, and so derived scalar implicatures, 83%, 84% and 87% of the time respectively. It is relevant to point out that when children rejected the puppet's statements, they were asked to motivate their response and they all provided a suitable justification.

As it can be noticed, a clear developmental trend emerged from this study in the ability to calculate scalar implicatures, since from the age of 6 children seemed to behave like adults, rejecting critical statements with "some" when a description with the quantifier "all" would have been more appropriate. When they were asked, children also provided correct justifications, invoking the stronger term of the scale (Foppolo et al, 2012). The 4- and 5-year-olds tend to split in two groups: half of them rejected critical statements and consequently derived scalar implicatures, whereas the other half accepted the under-informative-some statements.

As it can be seen, Foppolo et al.'s experiment suggest that children could calculate scalar implicatures connected with "some" already at the age of 6.

The debate on when scalar implicatures are derived by children remains open, as different studies using different methods and materials propose different outcomes. What is commonly accepted is that weak scalar terms tend to be treated logically by young children and more pragmatically by older ones.

Two hypotheses have been suggested that might explain why children behave differently from adults in the interpretation of scalar terms (Chierchia et al., 2001): the *Pragmatic Delay Hypothesis* and the *Processing Limitation Hypothesis*.

The *Pragmatic Delay Hypothesis* states that children may not derive scalar implicatures because they simply lack the prerequisite for deriving them. When they learn logical words, such as the quantifier "some", the scalar implicature associated with "some" is not already available to them.

The *Processing Limitation Hypothesis* assumes that children have the necessary semantic and pragmatic knowledge to compute scalar implicatures, but that they are not able to use it because of processing limitations. As a matter of fact, in order to calculate scalar implicatures two steps need to be followed: first, the meaning of a sentence and possible interpretations need to be considered, second the truth conditions for the meaning of a sentence and the one of its enriched (or scalar) meaning need to be calculated. Last, both interpretations need to be compared in order to figure out which interpretation is the most adequate and informative for a given context. Each part of this process takes part in the working memory: both possible interpretations and assertions must be kept in mind at the same time (Reinhart, 1999).

3.3 The acquisition of pragmatics in bilinguals

In more recent years, the study on how and when scalar implicatures are acquired by young children, has also led scholars to investigate how and when bilingual children acquire this ability. A few studies have been conducted aiming at understanding how bilingual children calculate scalar implicatures and different results have emerged.

Siegal et al. (2007, 2009, 2010) in their studies examined whether bilingualism triggers a potential advantage in general pragmatic abilities. The studies of Siegal and colleagues present data from children between 3 and 6 years of age and these studies demonstrate that bilingual children have an advantaged in pragmatic tasks. In Siegal et al. (2009) and Siegal et al. (2010) children have been tested on the comprehension of different kinds of implicatures related to the Gricean maxims of Quantity, Quality, Relevance and Politeness.

The study of Siegal et al. (2007) focuses on the acquisition of scalar implicatures in bilingual children. In this study twenty-one monolingual English-speaking children, twenty-three monolingual Japanese-speaking children and twenty English-Japanese bilingual children were tested. In this study children were in between 4 and 6 years of age. Participants were tested using a Truth Value Judgement Task and the material was presented in the respective native languages to monolingual children, whereas only in Japanese to the bilingual children group. Participants were presented with four short stories and at the end of each story they were asked to judge the accuracy of the statement uttered by a puppet. For example, experimenters told a story about a bear that was very good at putting hoops on a pole and pointed to a picture of the bear and hoops, all of which were already on the pole. At this point, the puppet described the event with an under-informative sentence, such as “The bear put some of the hoops on the pole”. The puppet’s sentences included the quantifier “some” in the English version and “ikutuka” (“some” in Japanese) in the Japanese version.

The results of this experiment suggest that bilingual children outperformed their monolingual peers: bilingual children rejected under-informative sentences 57% of the time, whereas Japanese and English monolingual rejected under-informative sentences 36% and 9% of the time respectively (Siegal et al., 2007). Before the experiment took place, all children were administered a British Picture Vocabulary Test (BPVT) or a Japanese Picture Vocabulary Test (JPVT). According to these tests, bilingual children

were reported to have a lower linguistic proficiency compared to the one of their monolingual peers. For this reason, Siegal and his colleagues believed that the source of the pragmatic bias is not linguistic (Siegal et al., 2007). Siegal et al. (2009) considered different potential explanations: one explanation is that bilingual children outperformed their monolingual peers thanks to their executive function skills, that is, mental processes that enable them to focus attention, plan, remember instructions and juggle multiple tasks successfully. Executive functions (EF) depend on three types of brain functions: working memory, mental flexibility, and self-control. Siegal et al.'s proposed that bilingual EF abilities allow them to consider simultaneously different appropriate interpretations to questions; another explanation is that bilingual children display more sensitivity to interpersonal communication and thanks to this, they are better able to detect pragmatic responses. Siegal et al.'s (2009) further explanation is that the different outcomes between bilinguals and monolinguals can be attributed to cultural differences. The last explanation offered is that bilingual children show more developed pragmatic abilities as a compensation for they weaker knowledge of core language. It has been suggested that the fact that bilingual face difficulties in vocabulary comprehension and in other aspects of their weaker language, lead them to become more attentive than monolinguals to certain pragmatic aspects of communication (Siegal et al., 2009).

If in Siegal et al.'s (2007) experiment, bilinguals outperformed monolinguals, these results were not replicated in Antoniou and Katsos (2017). In Antoniou and Katsos' experiment a multilingual, a bilectal and a monolingual group of Greek-speaking children were tested. Children were tested on different implicatures arising from Grice's conversational maxims. For the purpose of this section, the focus will primarily be on how these groups calculated scalar implicatures.

Participants included sixty-four bilectal children (speaker of Cypriot Greek and Standard Modern Greek) aged from 4 to 12 years, forty-seven multilingual children (bilectal in Cypriot Greek and Standard Modern Greek, also speakers of English and in some cases an additional language) and twenty-five monolingual children (speakers of Standard Modern Greek).

For the tests on scalar implicatures two subtests were used: an Action-Based Task ("where children had to make a display match a target utterance") and a Binary Judgement Task ("where they had to judge whether an utterance was a correct or

incorrect description of a picture") (Antoniou and Katsos, 2017, p. 9). There were two language versions of the implicature test: one version in Cypriot Greek and one in Standard Modern Greek. The same items were used in each language version. Bilectal and multilingual children took the test in Cypriot Greek, whereas monolinguals in Standard Modern Greek. A subset of seventeen bilectal children received the test in both Cypriot Greek and Standard Modern Greek.

In the action-based test, children had to actively take part in the experiment: they were presented with slides depicting five boxes and a selection of animals. Children were told they would hear a person describing the display and that they had to make the display match the description. They could do so by taking animals inside or outside of the boxes or leaving the display as it was. There were three infelicitous items involving the quantifier "some", for example "There are turtles in some of the boxes" in a situation in which there was a turtle in each of the boxes.

In the binary judgement task, participants were presented with a depiction of five cards face down. Experimenters then played an auditory stimulus, such as "There are X on Q of the cards", where X was the item type (rings, hearts, stars) and Q the quantifier (all, some, none) (Antoniou and Katsos, 2017, p. 12). When the auditory stimulus ended, the cards were revealed, and children had to evaluate if the sentences were correctly describing the cards. There were three critical under-informative-some cases. The rest of the items included semantically true and false sentences with "some", "all" and "none".

As in Siegal et al. (2007), in Antoniou and Katsos (2017) the language proficiency of the three groups was tested using the Word Finding Expressive Vocabulary Test and the Peabody Picture receptive Vocabulary Test. These tests revealed that language proficiency was lower in the bilingual and bilectal group than in the monolingual group.

The performance of the three group of children was compared to each other. To better compare and understand the results, the three groups were matched in age, thus children who were above 9 years or 6 years of age were excluded. Then the performance of a subset of seventeen bilectal children was contrasted to that of monolinguals (Antoniou and Katsos, 2017).

The results of this study did not provide any hard evidence for differences in bilectal, multilingual and monolingual children's implicature understanding abilities.

Moreover, multilingual children did not differ from monolingual in implicature understanding whether considering children who were dominant in the language of testing (Cypriot Greek) or children who were dominant in English. Similarly, bilectal children exhibited monolingual-like implicature understanding, whether they were tested in their dominant native variety (Cypriot Greek) or in the second, nonnative variety (Standard Modern Greek) (Antoniou and Katsos, 2017). These results suggest that multilingual and bilectal children perform like their monolingual peers despite the level of language dominance or proficiency.

Another study conducted by Dupuy et al. (2018) aimed at investigating the acquisition of scalar implicatures in early bilingual children. Given the contrasting results of previous studies (Siegal et al., 2007, Antoniou and Katsos, 2017), Dupuy et al. (2018, Experiment 2) wanted to bring more evidence to the case.

The participants of this experiment were thirty-three Slovenian monolingual and forty bilingual Slovenian-Italian children aged 10 – 11 years. The age range was chosen to be close to the upper range of the participants in Antoniou and Katsos (2017) and "experimenters wanted bilingual children to have a good command of both of their languages" (Dupuy et al. 2018, p. 17). In this study, Dupuy et al. created a Sentence Evaluation Task in which the target sentence was presented together with a context: eight short stories were presented together with seven image-sentence pairs, followed by a question. An example of infelicitous "some" is shown in Figure 3.2:

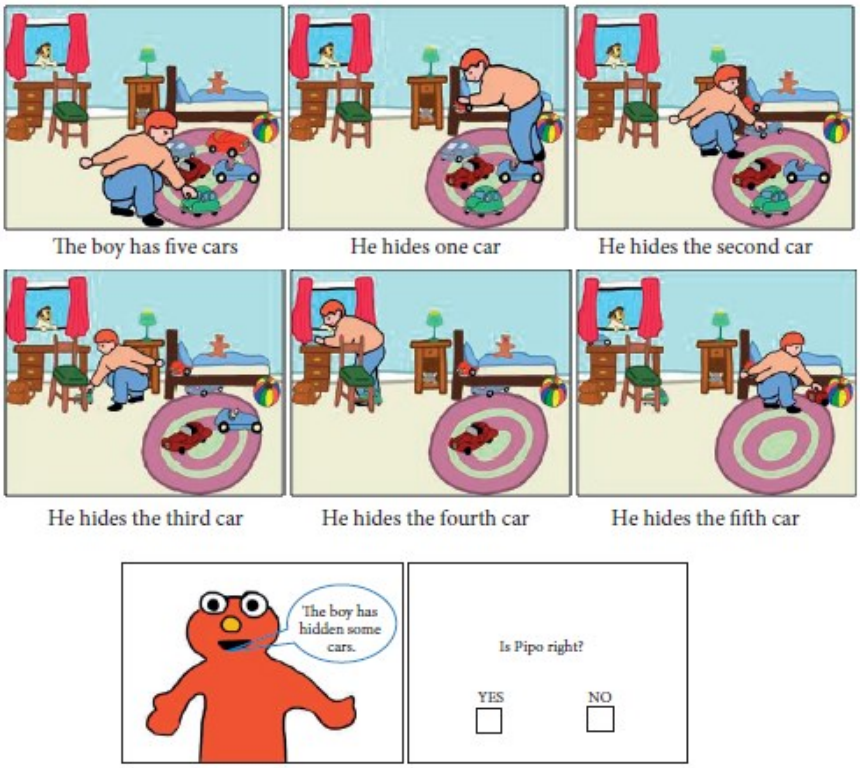

Figure 3.2 Example of a storyboard used in Dupuy et al.'s experiment for the pragmatic infelicitous "some" condition.

Dupuy et al. (2018). Pragmatic abilities in bilinguals: The case of scalar implicatures, Linguistic approaches to Bilingualism, p. 10

The control items were four stories for false "all", four stories for true "all" and four stories for felicitous "some". The control items for false "all" followed the same type of scenario, with the use of "all" instead of "some" (Dupuy et al., 2018, p. 11). For the felicitous "some" control condition a different scenario was displayed, as shown in Figure 3.3:

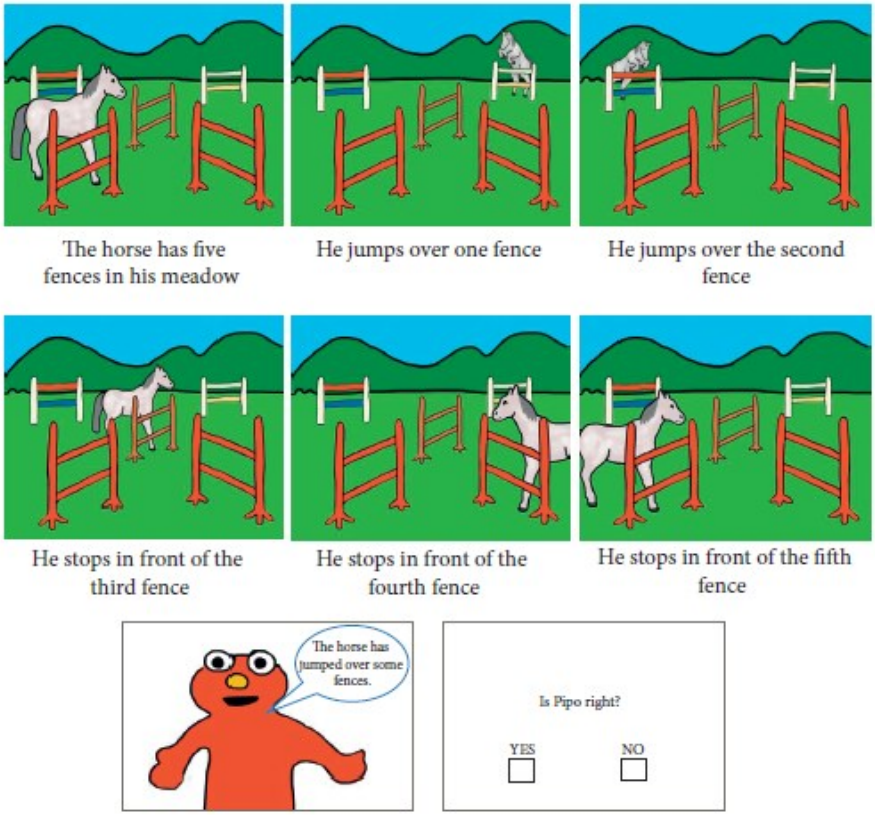

Figure 3.3 Example of a storyboard used in Dupuy et al.'s experiment for the felicitous "some" condition.

Dupuy et al. (2018). Pragmatic abilities in bilinguals: The case of scalar implicatures, Linguistic approaches to Bilingualism, John Benjamins Publishing Company, p. 11

The bilingual group was tested on all of the test items: half of them were presented in Italian and half of them in Slovenian. As in the other studies, the bilingual children language proficiency was tested. Experimenters administered the language proficiency test in the less dominant language, in order to make sure that the bilingual participants were competent in both languages.

Participants were tested individually by two experimenters, one native speaker of Italian and one native speaker of Slovenian. The Slovenian monolingual group was tested in Slovenian, whereas the bilingual group was randomly assigned to two groups: one group was presented with a set of sentences in Italian, the other group was presented with a set of sentences in Slovenian. The sentences were read to the child by the experimenters who spoke natively the respective languages.

Five children were later excluded from the experiment for their language proficiency performance and four participants were excluded because of a higher rate of errors on

control conditions. For this reason, the data used for this experiment come from the performances of 31 monolinguals and 33 bilinguals.

The results of this experiment are summarized in the following Figure 3.4:

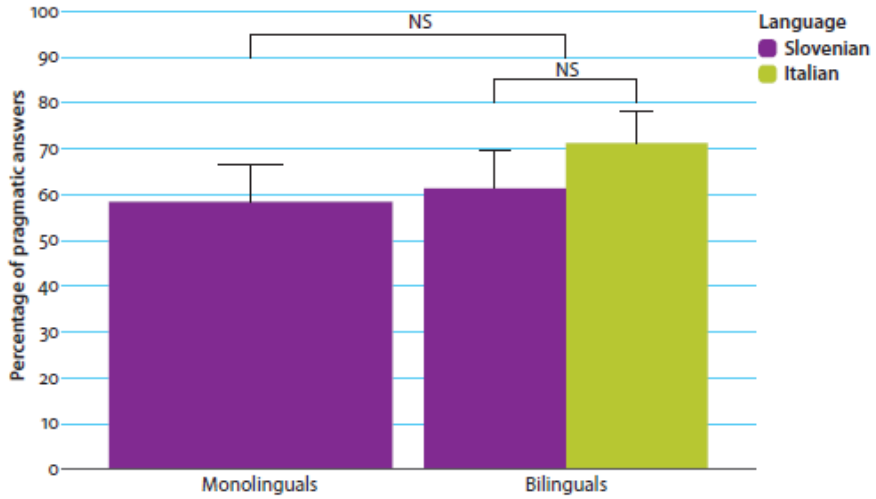

Figure 3.4 Percentages of pragmatics answers obtained by Slovenian monolingual children and Italian-Slovenian bilingual children

Dupuy et al. (2018). Pragmatic abilities in bilinguals: The case of scalar implicatures, Linguistic approaches to Bilingualism, John Benjamins Publishing Company, p. 20

As the Figure 3.4 indicates, the answers of the bilingual group were broken down for each of the respective languages they were assigned to (Slovenian/Italian). The monolingual and bilingual behaviour does not seem to dramatically differ: both groups of children rejected the infelicitous sentences with the quantifier "some" a comparable amount of time. This suggests that the amount of scalar implicatures generated by children does not seem to be affected by bilingualism.

As it can be noticed, Dupuy et al.'s results are in line with those of Antoniou and Katsos (2017), who tested 6 to 9 years old children and did not report a robust advantage in bilingual (and multilingual) children. Both experiments did not find evidence for supporting the idea that early bilingualism affects the development of pragmatic skills, in contrast to the results of Siegal et al. (2007).

Even though Siegal et al. (2007) and Antoniou and Katsos (2017) in their experiments used a similar task (children were required to judge the accuracy of sentences with "some" and "all" as description of various scenarios and both tasks required the generation of scalar implicatures in order to reject infelicitous sentences), they obtained different results. Moreover, Antoniou and Katsos (2017) did not document a bilingual (and multilingual) advantage also when using a different task

(Action-Based Task). As a matter of fact, a possible explanation offered by Antoniou and Katsos (2017) is that in their study a different age group was tested (6-9 years old) and in the study of Siegal et al. children were younger (4-6 years old). In fact, Dupuy et al. (2018) used a different task (Sentence Evaluation Task) on 10- and 11-year-olds and their results were in line with those of Antoniou and Katsos (2017). It has been argued that the impact of bilingualism is more evident during preschool years or alternatively that monolingual children catch up with their bilingual peers as they become older.

As it can be seen, there are still no clear answers to this issue and, even today, the debate remains open.

CONCLUSION

The aim of this dissertation was to investigate the acquisition of pragmatics by bilingual children, focusing on one of the topics studied by Experimental pragmatics, that is, scalar implicatures. The investigation has indeed focused on how bilingual children compute scalar terms and on understanding whether bilingualism represents an advantage in the computation of these terms or not. The investigation has been carried out by defining the field of pragmatics and some of the topics studied by pragmatists, focusing mainly on scalar implicatures. Then the investigation has moved to the study of language acquisition, more specifically on how and when both monolingual and bilingual children acquire different aspects of their language/s. In the final part of the investigation, the attention has turned towards some studies conducted on monolingual (Noveck, 2001, Guasti et al., 2005, Foppolo et al., 2012) and bilingual (Siegal et al., 2007, Antoniou and Katsos, 2017, Dupuy et al., 2018) children to investigate their ability to compute scalar implicatures. All these experiments tested the ability of children to compute scalar implicatures connected to the quantifier "some".

In Noveck (2001) Experiment 3, 8 to 10 years old French-speaking children were tested on their ability to derive scalar implicatures connected to the quantifier "certain" ("some") in French. The outcome of this experiment revealed that children are more likely than adults to accept under-informative sentences: most of them accepted sentences like "Some giraffes have long necks", giving evidence that they considered "some" as compatible with "all". Noveck (2001, Experiment 3) used a Statement Evaluation Task, that is a task in which children were presented with a series of statements and they were asked to say whether they agreed or not with those statements. In this task, no contextual information was provided. Noveck's experiment was partially repeated by Guasti et al. (2005), who proposed four different experiments. In the first experiment, 7-year-olds Italian-speaking children were tested on their ability to draw scalar implicatures connected with the quantifier "some". Children were presented with two lists of statements, such as "Some giraffes have long necks" presented either with the quantifier "some" or with the quantifier "all". In Guasti et al.'s Experiment 1 was also used a Statement Evaluation Task and the outcomes were similar to those of Noveck's Experiment 3: children were less likely to reject under-informative-some

sentences. The interesting thing is that in Experiment 2, Guasti et al.'s decided to had children undergo a training session. After that, children were tested with a Statement Evaluation Task and the results were surprisingly different: children displayed an adult-like behaviour and rejected underinformative-some statements much more than in the previous experiment. However, Guasti et al.'s Experiment 3 demonstrates that the effects of the training session do not last for a long time, since in this case (Experiment 3) the same children tested in Experiment 2 were retested after a week and they did not show an adult-like behaviour, but on the contrary, they failed to reject infelicitous sentences. The last experiment conducted by Guasti et al.'s suggests that when 7-year-old children were tested using a Truth Value Judgement Task, the results were different. In this task, children were also presented with contextual information and this seemed to help them in the rejection of under-informative statements. As a matter of fact, children acceptance rate has been drastically reduced.

Foppolo et al.'s in their experiment tested a wider group of Italian-speaking children (from 4 to 7 years old) using a Truth Value Judgment Task. This experiment revealed that monolingual children are able to compute scalar already at the age of 6.

On the basis of evidence from acquisitional studies two hypotheses have been proposed: the *Pragmatic Delay Hypothesis* and the *Processing Limitation Hypothesis*. The former hypothesis states that children do not derive scalar implicatures because they do not possess the prerequisites for deriving them; the latter hypothesis states that children possess both semantic and pragmatic knowledge, but that the pragmatic interpretation comes after the semantic one, as it involves a higher cognitive effort.

The three studies conducted on bilingual children used different tasks, but they all assessed the ability of bilingual children to derive scalar implicatures connected with the quantifier "some": in Siegal et al. (2007) a Truth Value Judgment Task was used, in Antoniou and Katsos (2017) an Action-Based Task and a Binary Judgment Task were used, lastly in Dupuy et al. a Sentence Evaluation Task was used.

In the first study (Siegal et al., 2007) tested English and Japanese monolingual children and English-Japanese bilingual children aged between 4 and 6 years old. Through this study, Siegal et al.'s noticed that bilingualism triggers a potential advantage in the computation of scalar implicatures since bilingual children outperformed their bilingual peers, even though their language proficiency was weaker.

Antoniou and Katsos (2017) and Dupuy et al.'s experiments led to different results: Antoniou and Katsos (2017) tested multilingual (bilectal in Cypriot Greek, and also speakers of English or other languages), bilectal (speaker of Cypriot Greek) and monolingual children (Standard Modern Greek) aged in between 4 and 12 years old; Dupuy et al. (2018) tested Slovenian monolingual and Italian-Slovenian bilingual children aged in between 10 and 11 years old. Both studies did not register a significant advantage in bilingual children. Antoniou and Katsos (2017) did not register a bilingual advantage when using a similar task to Siegal et al. (2007), but also when using a different task.

It has been proposed that bilingualism may represent an advantage during preschool years or that monolingual children develop their pragmatic abilities after bilingual children.

As it can be noticed different studies have been proposed, but the answers to how and when bilingual children compute scalar implicatures are still unclear. More specifically, it is not clear whether bilingualism represents an advantage in children. A few studies on bilingual children have been conducted to this day and these studies have proposed different results. If on one hand, some studies (for example, Siegal et al. 2007) are in favour of the idea that bilingualism benefits bilingual children, on the other hand other studies (for example, Antoniou and Katsos, 2017, Dupuy et al., 2018) suggest that bilingual and monolingual children face the same challenges when asked to resort to their pragmatic abilities.

For a clear answer to this question, further testing is needed.

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SUMMARY IN ITALIAN

Per molti anni nello studio del linguaggio, l'interesse di molti studiosi è stato principalmente quello di scoprire le regole e i principi astratti che stanno alla base del linguaggio. Spesso queste regole e principi si sono ispirati alla logica e alla matematica. Per molto tempo, i linguisti e i filosofi del linguaggio non consideravano come rilevante studiare la lingua che viene utilizzata nel quotidiano, al punto che la pragmatica è stata spesso considerata come "wastebasket", letteralmente un "cestino della spazzatura", dove gli aspetti del linguaggio, che erano difficili da definire all'interno di una teoria linguistica, venivano relegati. Al giorno d'oggi, la pragmatica non è più considerata in questo modo; infatti, a partire dal 1960, sempre più studiosi hanno compreso l'importanza dello studiare come la lingua viene utilizzata nella comunicazione umana.

Molti studiosi hanno cercato di definire in modo omogeneo il campo della pragmatica, ma tra tutti gli altri rami della linguistica, questo campo è sempre stato quello più difficile da definire. La pragmatica si occupa dello studio del significato, ma in modo differente rispetto alla semantica: la pragmatica si occupa, come proposto da Paul Grice (1913-1988), dello studio del "significato del parlante". Il significato del parlante rappresenta ciò che un parlante intende comunicare pronunciando un determinato enunciato. Uno dei punti centrali della pragmatica, infatti, è che ciò che viene detto, non sempre corrisponde a ciò che il parlante intende comunicare. Il concetto di contesto è importante nello studio della pragmatica, perché la pragmatica è coinvolta nell'interpretazione di ciò che le persone intendono dire in un particolare contesto e di come questo può influenzare ciò che viene detto. La pragmatica studia inoltre come gli ascoltatori riescono a interpretare ciò che il parlante intende dire.

A questo proposito, è importante menzionare uno dei concetti più importanti della pragmatica, ovvero il concetto di implicatura. Questo concetto è stato introdotto da Grice per spiegare come sia possibile intendere più di quanto detto. Secondo Grice, la conversazione è guidata da un Principio di Cooperazione che è diviso a sua volta in quattro massime: Quantità, Qualità, Relazione e Modo. L'idea di Grice è che le inferenze sono affermazioni implicite che si deducono in una conversazione dopo l'apparente violazione o osservazione di una massima conversazionale, sulla base del presupposto che gli interlocutori siano comunque cooperativi nel loro contributo alla

conversazione. Grice propone diversi tipi di implicatura: implicature conversazionali e implicature convenzionali. Le implicature conversazionali si suddividono a loro volta in implicature conversazionali generalizzate e implicature conversazionali particolarizzate. Le implicature conversazionali generalizzate non richiedono particolari informazioni contestuali per verificarsi, al contrario le implicature conversazionali particolarizzate necessitano di specifiche informazioni contestuali per realizzarsi.

In questa tesi ci si è focalizzati su un tipo di implicatura conversazionale generalizzata chiamata implicature scalare. Il concetto di implicatura scalare è stato introdotto dal linguista Laurence Horn nel 1972. Spesso quando parliamo scegliamo le informazioni selezionando parole che esprimono un valore da una scala di valori, come ad esempio: "<tutti, la maggior parte, molti, alcuni, pochi>" (Levinson, 1993, p. 143). Quando si produce un enunciato, un parlante sceglie le parole da una scala che lui/lei considera la più informativa e veritiera. Supponiamo che una classe di studenti chieda al professore i risultati dell'esame e che il professore risponda con (a):

a. Alcuni di voi hanno superato l'esame
b. La maggior parte di voi hanno superato l'esame
c. Tutti voi avete superato l'esame
d. Alcuni di voi – ma non la maggior parte di voi o tutti voi – hanno superato l'esame (Delfitto e Zamparelli, 2009, p. 93).

Se poi, una volta pubblicati i risultati, gli studenti scoprono che tutti hanno superato l'esame, una reazione di fastidio da parte degli studenti sarebbe accettabile, in quanto potrebbero pensare che il professore non abbia detto la verità. Da un punto di vista logico, il professore non ha mentito perché (a) è vero se e solo se almeno uno degli studenti ha superato l'esame ed è vero nel caso in cui tutti gli studenti hanno superato l'esame. Prendendo in considerazione le massime di Grice, il professore ha violato la massima di Quantità perché se avesse saputo che la maggior parte degli studenti aveva superato l'esame, avrebbe potuto usare (b). Il principio cooperativo ha guidato il professore nella scelta delle parole: se il professore ha scelto di utilizzare (a) è perché sapeva che (b) e (c) non erano corrette per la situazione. Infatti, nell'interpretare (a)

l'ascoltatore applica il principio cooperativo, considerando la negazione di (b-c) vera. L'esempio appena riportato è un esempio di implicatura scalare.

Nel secondo capitolo di questa tesi si è parlato dell'acquisizione del linguaggio. Nella prima parte sono state spiegate le teorie più influenti sull'acquisizione del linguaggio: il comportamentismo, l'emergentismo, la teoria basata sull'uso e infine l'innatismo. Al giorno d'oggi la teoria più accettata è quella proposta da Noam Chomsky, ovvero la teoria innatista. Secondo Chomsky, il linguaggio non è appreso, ma al contrario l'acquisizione del linguaggio è possibile grazie all'esistenza di una conoscenza linguistica innata. Chomsky considera il linguaggio come una capacità biologicamente determinata negli esseri umani e quest'ultimi hanno una dotazione genetica che permette loro di acquisire una lingua: la Grammatica Universale (UG). La UG non è da considerarsi come un insieme di regole prescrittive, ma bensì come un sistema cognitivo, un insieme di conoscenze e procedure astratte che specificano la particolare forma delle regole linguistiche. La UG si divide in principi e parametri. I principi sono la base universale di ogni lingua, sono principi o strutture sintattiche che appaiono in tutte le lingue; i parametri codificano le proprietà che variano da una lingua all'altra. Chomsky avanza la teoria dei parametri e dei principi perché, secondo la sua visione, gli stimoli presenti negli ambienti non sarebbero sufficienti per far dedurre al bambino, in assenza di un addestramento diretto, la complessa organizzazione della lingua, dato che quest'ultima non si può evincere dalle strutture superficiali di un enunciato. Secondo questa prospettiva, l'acquisizione avviene grazie ad una componente innata e la sua interazione con l'ambiente.

Qui di seguito verranno schematizzati i passaggi fondamentali nell'acquisizione del linguaggio:

- 0-4 giorni: i neonati riescono a discriminare la loro lingua materna da una non materna e tra due lingue non materne sulla base di proprietà ritmiche. I neonati discriminano solo tra lingue non appartenenti alla stessa classe ritmica.
- 4-5 mesi: i neonati iniziano a discriminare tra lingue appartenenti alla stessa classe ritmica. Discriminano inoltre suoni che non hanno mai sentito: i neonati giapponesi discriminano tra i suoni /l/ e /r/. Questi due

suoni non esistono nella loro lingua madre. Intorno ai 6-8 mesi iniziano a perdere questa abilità, che scomparirà totalmente intorno ai 12 mesi.

- 6-8 mesi: i bambini iniziano con le prime produzioni linguistiche: lallazione.
- 10-12 mesi: i bambini iniziano a produrre le prime parole.
- 18-24 mesi: avviene l'esplosione del vocabolario. In questa fase i bambini apprendono dalle 5 alle 9 parole al giorno. Iniziano anche a combinare le parole: si comincia con le olofrasi per poi combinare dalle 2 alle 3 parole.
- 30-36 mesi: sorgono le prime abilità morfosintattiche. I bambini in questa fase applicano le regole sintattiche anche a forme verbali irregolari: "fate", facete" (Guasti, 2007, p. 143).
- 3-4 anni: la lingua è generalmente strutturata in tutti i suoi aspetti.

Lo stesso vale per i bambini bilingui, infatti diversi studi hanno confermato che le fasi di acquisizione bilingue e monolingue non differiscono. Si è riscontrato però che spesso i bambini bilingui specializzano il loro lessico in una delle due lingue parlate. Il lessico recettivo sembra meno sviluppato rispetto a quello dei bambini monolingui quando si considerano entrambe le lingue separatamente, ma se il lessico delle due lingue viene sommato, il risultato ottenuto è un volume pari a quello monolingue. Infatti, il lessico del bilingue si sviluppa in base alle proprie necessità individuali. Non sempre i bilingui sono competenti allo stesso modo nelle due (o più) lingue parlate. È importante specificare che con il termine "bilinguismo" si intende una qualsiasi situazione di vita reale in cui due o più lingue (o dialetti) sono parlati indipendentemente dal livello di competenza.

Nel terzo capitolo si è trattato di come la pragmatica emerge nei bambini. Per quanto riguarda l'acquisizione della pragmatica, negli ultimi vent'anni si è sviluppata una nuova disciplina, denominata "pragmatica sperimentale". Uno dei temi d'interesse della pragmatica sperimentale sono le implicature scalari e più specificatamente come queste vengono acquisite e processate dai bambini. In questa tesi ci si è focalizzati principalmente su come le implicature scalari vengono processate dai bambini bilingui e

sul capire se il bilinguismo rappresenta un vantaggio nel processo computazionale di questi termini.

A dimostrazione della mia tesi tre studi su bambini monolingui (Noveck, 2001, Guasti et al., 2005, Foppolo et al., 2012) e tre studi su bambini bilingui (Siegal et al., 2007, Antoniou & Katsos, 2017, Dupuy et al., 2018) sono stati presentati. Tutti gli studi vogliono dimostrare la derivazione delle implicature scalari connesse al quantificatore "alcuni".

Nel caso dei bambini monolingui ciò che è emerso è che non è ancora chiara l'età in cui i bambini iniziano a derivare le implicature scalari connesse al quantificatore "alcuni". Gli studi sono stati condotti utilizzando diverse lingue, età diverse, diversi materiali e diverse procedure. Nonostante ciò, gli esiti che si sono ottenuti sono tutti differenti e perciò non è possibile dare una risposta chiara su come e quando i bambini monolingui derivino questi termini. Ciò che chiaro, è che i bambini tendono ad interpretare "alcuni" come compatibile con "tutti", in quanto il più delle volte accettano frasi come "alcune giraffe hanno il collo lungo".

Nel caso dei bambini bilingui ciò che è emerso dagli studi sono risultati differenti. Se nel primo studio (Siegal et al., 2007) hanno dimostrato che il bilinguismo gioca a favore dei bambini bilingui, negli altri due studi (Antoniou & Katsos, 2017, Dupuy et al., 2018) questo non è emerso. Anche in questi casi, i bambini sono stati testati con lingue diverse, età diverse, diversi materiali e procedure. Anche quando Antoniou e Katsos (2017) hanno utilizzato un metodo simile a quello di Siegal et al. (2007), non è stato riscontrato un vantaggio bilingue nel processamento di questi termini scalari. Dato che bambini di diverse età sono stati testati (dai 4 a 6 anni in Siegal et al., 2007; dai 4 ai 12 anni in Antoniou & Katsos, 2017; dai 10 a 11 anni in Dupuy et al., 2018), una delle proposte fatte da Antoniou & Katsos (2017) è che il bilinguismo può rappresentare un vantaggio nei primi anni, ovvero negli anni prescolari o che i bambini monolingui sviluppino le loro abilità pragmatiche dopo i bambini bilingui. Da questi studi si può dedurre quindi, che non è ancora chiaro se il bilinguismo rappresenti un vantaggio nel processo di derivazione delle implicature scalari.

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