# The Acquisition of Italian

Morphosyntax and its interfaces
in different modes of acquisition

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Maria Teresa Guasti

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# The Acquisition of Italian

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# Introduction

## Theoretically oriented acquisition studies: The state of the art in Italian

Language acquisition is a complex phenomenon in which internal and external factors inevitably interact in complex ways. Our point of departure is an approach to the study of the human language capacity according to which newborn children are equipped with (more or less) structured internal language-dedicated mechanisms (e.g. Chomsky 1988, 2005; Mehler & Dupoux 1990). These mechanisms are put into work through interaction with the external environment and the language data it provides. Results from formal studies in language acquisition have shown that it is only by looking at theoretically well defined research questions which typically concern subtle properties of the developing system that development itself can be properly characterized. At the same time, this type of study provides specific evidence on the functioning of the linguistic internal mechanisms themselves. In fact, the contribution of theoretically oriented studies on language acquisition is typically twofold: they both enhance our understanding of the linguistic computational mechanisms and define aspects and stages of linguistic development. Although the contribution of the external input is made evident by the fact that typically developing children converge on the language(s) they are exposed to and quickly pick up some crucial properties of the ambient language, it is a fact that children also make "errors", that is, they create expressions that do not reproduce the input. Crucially, the "errors" that children make during development always are linguistically possible expressions in some human language (e.g. Crain & Thornton 1998; Rizzi 2006); for instance, children have never been documented to undergo a stage in which they produce sentences with negation filling the third position in the sentence. Indeed, comparative studies indicate that languages with this property are not attested. This is a property that can be learned by a human being as the rule of a game, but, as neuroimaging techniques have clearly shown, its use does not activate typical language areas (Moro 2008). Hence, the internal language capacity is not just a predisposition to language, but an abstract structured system (e.g. Franck, Millotte, Posada & Rizzi 2013; Fisher 2002) These general considerations are in the background of the present book.

We report here results on the acquisition of Italian from studies run with different populations in different modes of acquisition. The specific perspective that we have adopted in our overview is in the tradition inaugurated by the Principles & Parameters (P&P) approach to the study of language and its more recent developments in minimalism and syntactic cartography (e.g. Chomsky 1981, 1995, 2001; Cinque & Rizzi 2010; Guasti 2002; Hyams 1986).

The fundamental insight of this approach to the study of language acquisition is that developmental acquisition data bear directly on the issue of how the final state

of language knowledge can be characterized. Developmental data from both typical and atypical development often reveal properties that may remain unnoticed by solely looking at the adult system, hence they also have a direct impact on the proper characterization of the adult state as well. For instance, sometimes typically developing children even at young ages appear to be able to use (produce and comprehend) constructions which look pre-theoretically complex; this immediately calls for a closer investigation of the computational mechanisms involved. A number of cases with these characteristics will be discussed in the chapters to follow; one case in point is resort to passive in object relative clauses and in wh-questions.

The described approach to the study of language acquisition, which we endorse in our investigations and in our overview, also has another important property. It is often the case that children undergo stages in their acquisition that are not target-like and cannot be directly drawn from the input. An important and innovative result of the approach is the observation that children's non-target stages are in fact possible options in other languages of the world as is expected in a biologically determined perspective. Specifically, in the P&P approach it is natural to think that children are open to try out possible UG compatible options before converging to the adult system. This is why the study of development may turn out to be crucial also in revealing general properties of the language system itself. Italian is no exception to this general outcome. Often in this book, we will consider non-target stages in development and recognize in them the manifestations of possible grammatical options active in different languages. Cases in point are the clitic omission stage, the article omission stage, the preference for types of passives that are not exploited in the adult grammar, the use of overt and null pronominal subjects.

## The different modes of acquisition

This book focuses on different acquisition modes of Italian, i.e. the acquisition of Italian in typical and atypical development, child and adult L2, bi/multilingual acquisition. Use of the term typical development refers to a mode of acquisition, which is identified as monolingual and which corresponds to the path followed by the majority of children. It should be kept in mind, however, that, strictly speaking, a pure monolingual speaker is probably an abstraction: the external conditions generally provide the opportunity to be exposed to more than one language (or dialect) for most of the Italian population. The extent to which the multilingual input is accessed is what makes the difference between what we call a monolingual speaker and a bi/multilingual speaker. With this proviso in mind, the monolingual mode of acquisition will constitute the *baseline* against which the other modes are compared. By atypical development, we mean different forms of pathological development such as Specific Language Impairment (SLI), Developmental Dyslexia (DD) and other forms mani-

fested in other syndromes. The study of atypical development directly contributes in a peculiar form to the understanding of the language faculty, as it is always the case that, by looking at a dysfunctional system, properties of the regularly functioning one may be displayed in an amplified fashion. This is realized in at least two ways. On the one hand, in the dysfunctional system non-target stages may last longer so that they can be better identified and more closely looked at; on the other hand, the acquisition of different linguistic properties does not always proceed in a parallel way as in typical development, which in turn may reveal specific points of higher computational complexity. One case in point may be represented by the (hard) acquisition of cliticization in contrast with the (easier) acquisition of some aspects of discourse pragmatics in the SLI population. This uneven development may also reveal that there might be some linguistic properties that need to be acquired at a critical time: if this does not happen, the relevant property may not be ever fully acquired and the problem may continue to manifest itself later in development.

Types of L2 acquisition and simultaneous bi/multilingual acquisition offer another lens through which the language faculty can be investigated. The studies that we will report from these populations all point to the necessity of distinguishing among them and from other forms of atypical behaviors which stem from language pathology. Moreover, they also shed light on the possible transfer of parametric properties, which is a peculiar route through which one may arrive at a better characterization of the format of parameters and the space of influence across languages.

## Some general assumptions of linguistic analysis

Throughout the chapters of this book we will have as our background an analysis of clause structure along the lines that we now describe in order to make our basic assumptions explicit. Following the minimalist tradition, we will usually represent clause structure in the simplified way in (1), with TP selected by C and selecting v:

(1)   CP
      /  \
     C    TP
         /  \
        T    vP
            /  \
           v    VP
                /\
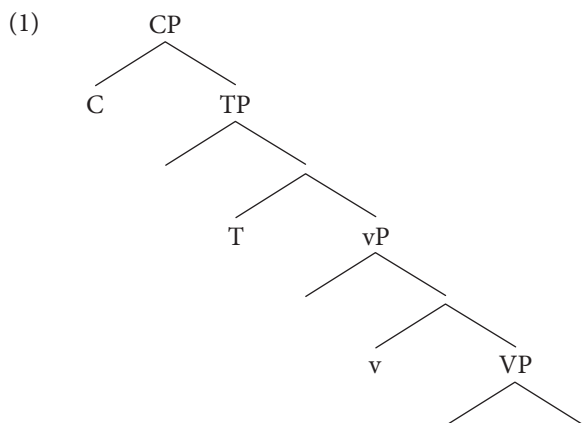
We will assume that CP and TP are widely more expanded as results from cartographic studies have shown (Cinque 2002; Rizzi 2004b; Belletti 2004b; and much subsequent work). Thus, whenever needed, we will make reference to the more articulated functional architecture of the clause. For instance, we will assume that inflectional heads related to different voices are present in the low functional area of the clause expressing e.g., (part of) the passive voice with its crucial property of triggering syntactic movement of part of the verb phrase (Collins 2005). The low area also hosts discourse related positions, such as the one expressing new information Focus (Belletti 2001b, 2004a), which is to be kept distinct from the left peripheral focus position (Rizzi 1997) in a language like Italian. A number of D-related agreement type heads are also present in the clause structure hosting agreement features expressing subject verb-agreement, past participle agreement and so on (Belletti 2001a). The CP left periphery is assumed to contain head positions attracting constituents into their specifier, as in the case of relative clauses (Friedmann, Belletti & Rizzi 2009) and wh-questions (Rizzi 2004a; Guasti, Branchini & Arosio 2012). In the nominal system, we will assume an articulated structure for the noun phrase, although we will basically employ the simplified D+NP DP structure (Abney 1987).

This book provides an overview of the state of the art of the research on the acquisition of Italian. It can be read in two ways. It can be both used as a tool to be informed of what we take to be the most significant results up to now on the acquisition of Italian in different acquisition modes, and it can also be used as a starting point for further investigating different topics in acquisition, also comparatively. Our aim is to present results in such a way that *baselines* of different profiles can be recognized thus constituting a point of departure for further investigation. In this vein, all chapters are organized in the same way. First, we present some basic descriptive properties of the phenomena to be investigated in the chapter itself integrated with some analytical assumptions adopted. Then, we proceed to the presentation of the overview of the research in typical monolingual development, followed by the presentation of the acquisition of the same domain in different modes of acquisition, in atypical development of various kinds (mainly SLI; DD; Hearing impaired) and in bi/multilingual acquisition and adult and child L2. We conclude each chapter with a section in which its content is summarized and the various profiles emerged are synthetized. Finally, the concluding section indicates a number of questions for further future research, which are opened by the results and theoretical analyses presented.

This book can be read chapter after chapter; alternatively, the reader can go directly to the chapter(s) dealing with a topic of interest. For this reason, each chapter is self-contained and does not rely on information given in previous chapters. This has the consequence that some redundancy may be detected across some of the chapters as for the presentation of analytical hypotheses and analyses; however, each time hypotheses and analyses strictly refer to the issues addressed in the relevant chapter(s).

# The acquisition of morphosyntactic properties

CHAPTER 1

# The acquisition of verb inflections
# and clause structure

## 1.1    Introduction

Italian verb inflections are quite numerous. There are fifteen tenses, divided in 4 moods (indicative, subjunctive, conditional and imperative). Finite verbs display different inflectional markers for different persons. There are also non-finite verbs with a present and a past version (infinitive, participle and gerund). In this section, we start with the introduction of the main features of the Italian verbal inflectional system, aiming at setting out the ground for the subsequent discussion about the intricacies of its acquisition (see Chapter 2 for the acquisition of nominal inflectional morphology).

Verbs in Italian never occur as bare roots. In most cases, they are suffixed with a thematic vowel (*tv*) and always with an inflectional marker or just with the thematic vowel, e.g. parl-*a*. The *tv* identifies one of the three morphological classes or conjugations, -*a* (I conjugation), as in parl–*a-re* 'speak', -*e* (II conjugation), as in rid-*e-re* (laugh) and -*i* (III conjugation), as in part-*i-re* (leave). The most productive conjugation is the first conjugation. Loan verbs (*fax-are,* fax), verbs derived from adjectives (*facilitare*, to make easy from *facile*, easy) and from nouns (*ironizzare*, to be ironical from *ironia*, irony) go into this class. According to Say and Clashen (2002), the I conjugation includes most of the Italian verbs, 1709 (73%), all of which are regular, with the exception of three verbs (*andare*, go, *dare*, give and *stare*, stay). The second conjugation has 403 verbs (17%), most of which are irregular and the third conjugation has only 238 verbs (38%), most of which are regular. This conjugation also includes deadjectival verbs, like *ringiovanire* (to make young) from *giovane* (young). These figures are obtained based on calculations on two Italian frequency dictionaries (Bortolini, Tagliavini & Zampolli 1971, and de Mauro, Mancini, Vedovelli & Voghera 1993).[1]

The root and the *tv* form the stem. The inflectional marker encodes some or all information about person, number, tense, mood and aspect. Many inflected verbs are stem based (*parl-a-vo,* I was speaking, *rid-e-vo*, I was laughing, *part-i-vo*, I was

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1.    According to Orsolini, Fanari and Bowles (1998), first conjugation includes 3000 verbs, second 350 and third 500 verbs. They do not report the source of these figures.

leaving), but some are root based: *parl-o*, I speak, *rid-o*, I laugh, *part-o*, I leave). In Table 1.1, we have the paradigm of the present tense of three verbs, one for each conjugation.

**Table 1.1.** Inflectional paradigm of the indicative present tense

| parl-are (speak) | rid-ere (laugh) | part-ire (leave) |
|---|---|---|
| Io parl-o (I speak) | Io rid-o (I laugh) | Io part-o (I leave) |
| Tu parl-i (you speak) | Tu rid-i (You laugh) | Tu part-i (you leave) |
| Lui parl -a (he speaks) | Lui rid-e (He laughs) | Lui part-e (He leaves) |
| Noi parl-iamo (we speak) | Noi rid-iamo (We laugh) | Noi part-iamo (We leave) |
| Voi parl-ate (you speak) | Voi rid-ete (You laugh) | Voi part-ite (You leave) |
| Loro parl-ano (they speak) | Loro rid-ono (They laugh) | Loro part-ono (They leave) |

We can note that each inflectional marker carries person and number features, which agrees with its subject. In fact, each inflection marker is informative of the features of the subject, which can be null in Italian.

The auxiliaries *avere* (HAVE henceforth) and *essere* (BE henceforth) are irregular verbs and are also fully inflected. They are used in compound tenses, as the *passato prossimo* (compound past or present perfect). The auxiliaries carry person and number information and are followed by a past participle verb. This is illustrated in Table 1.2.

**Table 1.2.** Paradigm of the *Passato prossimo*

| | |
|---|---|
| Io ho parlato (I have spoken) | Io sono andato (lit. I am left) 'I have left' |
| Tu hai parlato (You have spoken) | Tu sei andata (lit. You are left) 'You have left' |
| Lui ha parlato (He has spoken) | Lui è andato (lit. He is left) 'He has left' |
| Noi abbiamo parlato (We have spoken) | Noi siamo andati (lit. We are left) 'We have left' |
| Voi avete parlato (You have spoken) | Voi siete andati (lit. You are left) 'You have left. |
| Loro hanno parlato (They have spoken) | Loro sono andati (lit. They are left) 'They have left' |

The auxiliary BE is used with unaccusative verbs, while HAVE is used with all the other verbs. The past participle is generally in the unmarked masculine form (*-o*), with some exceptions. The past participle of unaccusative verbs agrees in number and gender with the surface subject, as seen in (1):

(1)   Maria  e   Luisa sono  partit-e.
      Maria  and  Luisa are   left-fem-pl
      'Maria and Luisa left.'

The past participle of transitive verbs agrees in gender and number with its object when this is expressed by a clitic, as in (2).

(2)  Gianni  le            ha    vist-e.
     Gianni  them-fem-pl   has   seen-fem-pl
     'Gianni saw them.'

Some verb inflections are homophonous across modes and conjugations. For example, with the exception of the second person singular of the first conjugation (present: *tu parl-i*, you speak-2sg vs. imperative: *parl-a*, speak-2sg), the second person singular and plural of the indicative and imperative are homophones.

In spite of this complexity, Italian-speaking children already master some verb inflections at age 2;6. Present tense emerges before other tenses. Then, we have the *passato prossimo* and the *imperfetto* (also a past tense), as we will see. This sequence of acquisition may be dictated by the greater morphological and structural complexity displayed by these tenses. Children distinguish between finite and infinitive verbs, and unlike in other early languages, infinitive verbs are not used as root infinitives (RIs). Rather, imperative forms have been claimed to be the Italian analogue of RIs. In compound tenses, children optionally omit auxiliaries at the beginning and continue to do so for some months and only produce the past participle. Omission of the auxiliary BE is higher than omission of the copula BE, suggesting that phonological properties are not the main cause of omission. In addition, copula omission manifests some structural restrictions.

The acquisition of the verb inflectional system does not seriously tax children with SLI, either. Only the present third person plural inflection seems to be challenging for these children and to some extent, it is also challenging for individuals with Developmental Dyslexia. The production of auxiliaries is also problematic for children with SLI, but to a lesser extent than that of other morphemes, like clitics (see Chapter 3).

The chapter is organized as follows. In Section 2, we will examine the sequence of acquisition of the various tenses; in Section 3, we discuss the acquisition of present tense inflections and in Section 4, we consider the nature of the subject-agreement relation in child grammar. We discuss the distinction between finite and infinitive verbs and the phenomenon of RIs in early languages, in Section 5 and 6. In this context (Section 7), we consider the hypothesis that the second person of imperative verbs is the Italian analogue of RIs in other early languages. In Section 8, we examine the use and distribution of the copula BE in early speech and how this use compares to that of auxiliaries HAVE and BE. Next, in Section 9 and 10, we consider the use of past participles, their verbal or adjectival nature in child language and we examine the *Aspect First hypothesis*. In Section 11, we discuss the formation of regular and irregular past participles and past definite. In Section 12 we report on the acquisition of the *imperfetto*. We conclude with a discussion of the acquisition of verb inflections in children with SLI and Developmental Dyslexia.

## 1.2    Acquisition of verbal tenses

Italian has many verbal tenses, as we said earlier. The indicative present tense is the most common in child speech, followed by the imperative present and the *passato prossimo* (present perfect). Auxiliaries are often omitted in the *passato prossimo* and only past participles are used. The *imperfetto* comes after the present and the present perfect, but according to experimental studies, its comprehension is problematic (see Section 12). These observations hold true of the longitudinal data (age range 1;4 to 3;0) discussed in Pizzutto and Caselli (1992), Guasti (1993/4) and of the cross-sectional data discussed in Caprin and Guasti (2009) (see also Hyams 1986). Caprin and Guasti analyzed the semi-spontaneous speech of 59 children (aged between 1;10 and 2;11), who were divided in three groups based on their MLU: G1 (MLU: 1.0–1.5; number of children: 15; Mean age: 2;3), G2 (MLU: 1.5–2.0; number of children: 19; Mean age: 2;4), G3 (MLU: 2.0–3.1; number of children: 25; Mean age: 2;6). Table 1.3 shows that the present tense is already used frequently by G1 and its use remains stable across the three MLU groups; in most cases, we find verbs belonging to the I conjugation, although other verbs are also present. The *passato prossimo* slightly increases, while imperative verbs, which are initially very frequent, decrease. Bare past participles first increase and then decrease. The column Infinitives includes both selected infinitives and infinitives in isolation or RIs, to which we will return later (see Section 6). The use of infinitive verbs slightly increases and more infinitives selected by a governing verb are used with development. Finally, a variety of other tenses is used in G3.

**Table 1.3.** Percentage of use of the various tenses by 59 typically developing Italian-speaking children divided in three groups according to their MLU. Semi-spontaneous data from Caprin and Guasti (2009)

| Group/Age/ Number | Present indicative | Passato prossimo | Imperative | Past participle | Infinitive | Other tenses |
|---|---|---|---|---|---|---|
| G1/2;3 (N = 15) MLU:1.0–1.5 | 53% | 4% | 33% | 6% | 2% | 1.5% |
| G2/2;4 (N = 19) MLU:1.5–2.0 | 50% | 6% | 24% | 10% | 5% | 5% |
| G3/2;6 (N = 25) MLU:2.0–3.1 | 50% | 8% | 13% | 5% | 6% | 18% |

Calleri et al. (2003), based on spontaneous data, reported that the *imperfetto* appears around age 2;0 with a deictic past meaning referring to completed actions. This is not the meaning associated with the *imperfetto* in the adult language, though. The deictic past meaning would seem more appropriately expressed by the *passato prossimo*. The *imperfetto* is an anaphoric tense that typically requires to be anchored

to some other temporal point. This is illustrated in (3) and (4). In (3), the anchor is provided by the *when*-clause and in (4) by the temporal expression *at 3 o'clock*.

(3)　Leggevo un libro, quando Maria è entrata
　　　(I) was reading a book, when Maria entered

(4)　Alle 3, leggevo un libro
　　　At 3 o'clock, (I) was reading a book

Saying *leggevo un libro* (I was reading a book) out of the blue is odd. But this is precisely what children did, failing to recognize the anaphoric value of the *imperfetto*, according to Calleri et al. This conjecture is in line with what we will see later about comprehension (Section 12). Calleri et al. (2003) also reported that the future appears at age 3;0, but is also expressed through the use of lexical forms, like *poi* (afterward) or *domani* (tomorrow).

　A similar sequence of acquisition is found in Italian L2. Banfi and Bernini (2003) reported that in a first period, L2 adults used the present third person of the indicative as an unanalyzed form, along with the infinitive, then they used the *passato prossimo* (with or without the auxiliary), followed by the *imperfetto* and then the future. Calleri et al. (2003) pointed out that in adult L2 acquisition one observes the use of infinitive verbs in place of finite verbs. This use, as we will see, is rare in monolingual Italian-speaking children (Sections 5 and 6). In this respect, adult L2 learners are different from monolingual Italian-speaking children. This is not unusual. Prévost and White (2000) found that adult L2 learners of French differed from monolingual children and from early L2 children in their use of infinitive verbs in the place of finite verbs. French-speaking monolingual and early L2 children do not use infinitive verbs with subject clitics and do not place them in the wrong position with respect to the negation, while adult L2 learners do.

## 1.3　Acquisition of present tense inflections

Based on longitudinal data, it emerges that Italian-speaking children start to use some verb inflections around 1;6 or when their MLU is around 1.0 and 1.5. This use may still be formulaic. Verb inflections gradually increase when children's MLU is between 1.5 and 2.5. Between 2;0 and 2;6 years, children have acquired the three present tense singular inflections, even when a stringent criterion as that of 90% correct use is employed (Pizzuto & Caselli 1992; Guasti 1993/1994). Acquisition of these mini-paradigms (De Marco 2005) is evident not only through quantitative data, but also through a qualitative analysis of the data. The three person singular inflections are used with the same verb, as in (5a, b) and each inflection is used with different verbs, as in (5c).

(5)  a.  mett-o, metti-i, mett-e (put-1sg, put-2sg, put-3sg)
     b.  ap(r)-o, ap(r)-i, ap(r)-e (open-1sg, open-2sg, open-3sg)
     c.  casc-o, scapp-o (fall-1sg, run-1sg away)

Present tense plural inflections appear some months after singular inflections (1;11) and are used consistently when MLU is longer than 2.5. The asymmetry between singular and plural inflections was observed also in two cross-sectional studies, the one mentioned above by Caprin and Guasti (2009) and another based on an experiment, in which children were asked to describe target pictures designed to elicit the relevant inflections (Caselli, Leonard, Volterra & Campagnoli 1993; Leonard, Caselli & Devescovi 2002). Caprin and Guasti found that the three present person singular inflections were already consistently used by G1 (age 2;3) (90% correct); plural forms (first and third) appeared consistently in G2 (age 2;4) and their use was error-free (100% correct). Similarly, Caselli et al. (1993) found that, between age 2;6–3;0, the third person singular inflection was correctly used 92% of the time, while the third person plural marker was so 80% of the time. Between age 3;6 and 4;0, the percentages of correct use was 98% and 94%, respectively. Leonard, et al. (2002), based on an elicitation study, reported that the first person singular marker was used more accurately than the first person plural marker and that the third person singular was employed more accurately than the third person plural marker in the youngest group of children (age range 2;5–3;1), but not in the other groups. Table 1.4 provides a breakdown of the correct use of 4 verb inflectional markers in 5 age groups of children.

**Table 1.4.** Percentage of correct use of first and third singular and plural inflectional markers by 5 groups, each consisting of 12 typically developing Italian-speaking children (for a total of 60 children). Elicited production data from Leonard, Caselli and Devescovi (2002)

| Age | 2;5–3;1 | 3;5–4;1 | 4;5–5;1 | 5;5–6;1 | 6;5–7;1 |
|---|---|---|---|---|---|
| first sg | 86% | 96% | 100% | 100% | 100% |
| first pl | 72% | 92% | 92.5% | 98% | 98% |
| third sg | 98% | 100% | 98% | 97.5% | 100% |
| third pl | 86% | 97% | 98% | 98% | 99% |

Although the age of mastery of particular inflectional markers vary across studies, likely due to different methodologies employed (spontaneous or experimental method), the design of the study (longitudinal or cross-sectional) and the criterion of acquisition (90% or 75% correct in obligatory contexts), it is clear that by age 3;0 singular and some plural inflections are used above 75% correctly. These data indicate not only that children master the use of some inflectional markers by age 3;0, but also that they are accurate in the realization of subject-verb agreement. Errors of agreement are

rare (about 3%) and often concern the replacement of the third person plural marker with the third person singular one, as exemplified in (6) below from Guasti (1993/4) or of the first person plural with the first person singular, i.e. they make number errors. Another type of error is the replacement of the third person singular with the first person singular, as in (7):

(6)  a.  Caregiver:  I topolini cosa fanno?
                       The little-mice, what do-3pl?
                       'The little mice, what are (they) doing?'

      Child:         gioca (target: giocano)
                     (they) play-3sg (target: play-3pl)

   b.                e@p mucchine mangia (target: mangiano)
                     e@p little cows eat-3sg (target: eat-3pl)

(7)  io poi gioca (target: gioco)
     I then play-3sg (target: play-1sg)

Other errors, reported in Pizzuto and Caselli (1992), concern the regularization of irregular verbs (8) or the use of the third person inflection, when children refer to themselves with the name (which is formally speaking correct and is a peculiar feature of the Italian child-directed speech) (9):

(8)  a.  vieno (target: vengo)
         (I) come-1sg

   b.  dicio (target: dico)
       (I) say-1sg

(9)  Checco batte (target: io batto)
     Checco bang-3sg (target: I bang-1sg)

In summary, Italian children start to use verb inflections before age 2;0 and at about age 2;0–2;6 they master the three present singular inflections. Plural markers appear some months later than singular ones and are consistently used and almost error-free between 2;6 and 3;0. In general, there are very few errors, which consist in the substitution of the plural with the corresponding singular inflection (see also Dispaldro 2012). Pizzuto and Caselli (1992) argued that verb inflections were not productively used before MLU is 2, but Caprin and Guasti (2009) found that already in their G1, when MLU was below 2, the three person singular markers were productively used (90%) by most of the children. Comparing the Italian and the English data (Brown 1973), Pizzuto and Caselli (1992) noted that Italian-speaking children had acquired the second and third person singular verb inflection in stage 1 (MLU: 1.0–2.2), while English-speaking children acquired the third singular verb inflection in stage 3 (MLU: 2.75–3.49) or 4 (MLU: 3.5–3.99). This means that verb inflections are acquired earlier in Italian than in English, in spite of the apparent complexity of the Italian verbal paradigm.

This discrepancy suggests that the presence of largely regular and consistent paradigms is beneficial to the child. Tomasello and collaborators (e.g. Tomasello 2003) argued that children initially treat each inflected verb as an island, independent from other forms based on the same root or stem, an hypothesis known as the *verb island hypothesis*. It is only after age 3;0 that knowledge of rules operating on symbolic objects becomes part of the children's linguistic capacity, when enough instances of the same verb have been accumulated and generalization, based on analogy, occurs. Under this view, a lot of exposure is needed to generalize the verbal paradigm from single instances. The data from a richer language like Italian challenge this view, because they show that children have mini-paradigms before age 3;0, i.e. children do not treat inflected verbs as island (but see D'Odorico, Fasolo, Cassibba & Costantini 2011 for a different view). This point is also proven by regularization errors, i.e. children produce verbal forms not present in their input. Although children may possess some verb-specific pattern in some stages of development, this does not imply that they do not also possess some abstract structural knowledge. As suggested in Leonard (2011), the two types of knowledge may coexist. Children may refrain from some generalizations in production (for example they may avoid using a verb heard in an intransitive frame in a transitive frame), because they are conservative (Fisher 2002). Thus, they do not attempt to extend a given pattern, if they have not had sufficient evidence. However, these same children are able to understand sentences in which the given patterns (transitive frame) are used.[2] This comprehension ability would be mysterious if children did not possess a flexible machinery that abstracts away from specific patterns (see Franck, Milotte, Posada & Rizzi in press).

## 1.4   The process of subject-verb agreement

The facts reviewed in the previous section point toward the conclusion that Italian-speaking children know part of the verbal paradigm of the present tense already

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**2.**   Our claim that Italian-speaking children possess abstract knowledge of verbal paradigms at around age 2;6 is compatible with proposals by Enderess and Bonatti (2007), according to which humans avail themselves of two mechanisms to analyze speech input: a rapid one for extracting structural regularities and a slower one to perform statistical computation and detect co-occurrences. Interestingly, while the first mechanism can extract structural regularities based on a very short familiarization (2 minutes can be sufficient), the second needs a longer familiarization phase (the best results were obtained with 60 minutes familiarization). Enderess and Bonatti carried out their experiments with adults, and thus their conclusions are based on adult speech processing. However, the null hypothesis is that children also possess the same mechanisms and that these work more or less in the same way as they do in adults.

around age 2;0–2;6. They make very few errors of verb agreement; they also optionally omit subjects, as Italian is a null subject language, and recover it through verb inflections. On this basis, Guasti (1993/4) has conjectured that Italian-speaking children have grasped the notion of subject-verb agreement before age 3 (see also Guasti 2002).

In the adult grammar, this is a hierarchical notion holding between a phrase (the subject) and the Inflectional (I) head encoding person, gender and number features. What is the nature of this notion in child grammar? There is evidence that, in child grammar, this notion is not based on semantic grounds. If agreement were based on a semantic rule, like the verb agrees with its agent, we would expect children to be able to perform agreement only with agent subjects, but this is clearly not the case. Children do not make errors when they use verbs that do not take an agent subject, as seen in (10).

(10)    Voglio bere!
        (I) want-1sg drink-INF

Moreover, in copular sentences, the verb BE does not assign an agent role (Moro 1997) and indeed does not assign an external thematic role at all. Thus, agreement between the structural subject and the copula cannot be semantically based. Nevertheless, children do not have trouble with agreement in copular constructions (see Section 8 for a discussion of copular constructions in child language), as in (11).

(11)    a.    Chetta è    la    papera  (Martina, 1;11)
              This    is   the   duck

        b.    Ci     sono  maiali?  (Guglielmo, 2;3)
              there  are   pigs?
              'Are there pigs?'

Finally, with impersonal *si*-sentences, the intended subject refers to a plurality of individuals. Formally, the verb in these sentences is third person singular. Children, especially in the Central part of Italy, use this type of sentences frequently and are never misled by the plurality of the intended reference:

(12)    Si  mangia la    pizza  (Diana, 2;0)
        SI  eat-3sg  the   pizza
        'We eat pizza.'

Thus, subject-verb agreement is not semantically ruled, as children do not make agreement errors in those contexts in which the subject is not an agent or the intended referent does not determine agreement on verbs. It is also not the case that children use a linear rule, whereby subject-verb agreement is established with the first noun or pronoun to the left of the verb. First, children omit subjects, but use the correct agreement. In this case, there is no noun to the left of the verb. Second, children conforming

to the grammar of Italian, use pre-verbal and post-verbal subjects, and in both cases, they correctly express agreement on the verb:

(13)    a.    L'ap(r)o io (Diana, 1;10)
              it open-1sg I
              'I open it.'

        b.    (Al) mare andavo io (Raffaello, 2;0)
              (to-the) see go-PAST I
              'I used to go to the sea.'

Notice incidentally that also in (11b), discussed above, the subject is to the right of the copula form and agrees with it. Finally, when children use coordinate subjects, agreement is established with the complex coordinate subject and not just with the first noun to the left of the verb:

(14)    Gaia e Giulia (si) danno un bacino (Diana, 2;0)
        Gaia and Giulia (each other) give-3pl a little kiss
        'Gaia and Giulia kiss each other.'

The facts reviewed here lead us to exclude that subject-verb agreement in child grammar is based on a semantic rule or on a linear adjacency rule. Example (14) is also interesting, because it proves that agreement is a relation involving a phrase (the complex subject) and an inflected verb. It seems that the most parsimonious hypothesis is to assume that in child grammar agreement is a hierarchical relation between a phrase and the head including agreement features, as it is for adults. In this respect, there is continuity between the child and the adult system.

Further evidence for the claim that children are sensitive to the relation of subject-verb agreement comes from an experiment carried out by Moscati and Rizzi (2014). In this study, children had to choose between two sentences uttered by two puppets. One sentence displayed correct subject-verb agreement and the other did not. At the age of 3;6, children chose the correct sentence 80% of the time. This ability improved from 3 to 5-years, when children reached 93% correct choices. Note that choosing between two sentences is a sort of grammaticality judgment and likely involves metalinguistic competence that is not required in producing correct agreement (see also Arosio, Adani & Guasti 2009, for the use of grammaticality judgment in testing subject-verb agreement). Devescovi, D'Amico and Gentile (1999) further showed that children from 5 to 9 years of age use verb agreement to single out their subject. Thus, the data show that children produce correct agreement before age 3, likely basing themselves on a formal notion of subject-verb agreement relation, and at 3;6 have some metalinguistic knowledge of this relation, although with age they can still improve this knowledge.

## 1.5   Acquisition of the finite versus infinitive verb distinction

Infinitive verbs used as main verbs or RIs or optional infinitives (OI) are rare in Italian. We said earlier that they are around 1% in the Caprin and Guasti (2009) study. In the longitudinal study by Guasti (1993/4), RIs were at most 3%. In fact, Italian-speaking children use infinitive verbs in the appropriate structural contexts. Guasti (1993/4) showed that Italian-speaking children know the distributional properties of finite and infinitive verbs. Infinitive verbs were used after prepositions or in contexts in which they were selected by finite verbs (e.g. restructuring verbs, like modals), as seen in (15).

(15)  a.  Pe' c(u)ocere (Martina, 1;8)
          To cook-INF

      b.  Posso entrare? (Diana, 2;1)
          May-1sg (I) come-INF in?

The use of the infinitive verbs is not formulaic and does not support the verb island hypothesis. In fact, Guasti (1993/4) showed that before age 2;0, one child, Martina, used both finite and infinitive instances of the same verbs:

(16)  Infinitive                Finite
      andare (go-INF)           va             ((he) go-3sg)
      aprire (open-INF)         ap(r)o, apri   ((I) open-1sg, (you) open-2sg)
      chiudere (close-INF)      chiudo         ((I) open-1sg)

Although additional evidence is needed, the lexicon of this child shows that infinitive and finite forms are not islands, but are related. These facts are evidence that children form the paradigms of verbs and acquire the intricate network of the different tenses. They constitute another piece of evidence that potentially challenges Tomasello's *verb island hypothesis*. Another fact pointing to the conclusion that children know the distributional properties of infinitive verbs is the placement of clitic pronouns. When children use clitics (in bold in the examples below; see also Chapter 3) in combination with verbs, they place them before finite verbs, as seen in (17) (from Guasti 1993/4).

(17)  a.  **Lo** naccondi su (Martina, 1;8)
          (you) it hide-2sg up
          'You hide it up.'

      b.  Quetto, **me l'**apri? (Martina, 1;8)
          this, (you) to+me it open-2sg?
          'Can you open this for me?'

In the case of infinitive verbs, the clitic is placed after the verb, if this is alone; when the infinitive is governed by a modal verb, children (like adults) place the clitic

before the finite modal verb or after the infinitive verb. This is illustrated in (18) from Guasti (1993/4).

(18)  a.  Devo caricar**lo** (Guglielmo 2;7)
          (I) must-1sg load-INF-it
          'I must load it.'

      b.  **Lo** devi mettere qua sopra (Guglielmo 2;7)
          (you) must-2sg put-INF here up
          'You must put it up here.'

We can conclude that Italian-speaking children know the distinction between finite and infinitive verbs; their lexicon may include the same verb in its finite and infinitive form and thus these verbs are not islands. Italian-speaking children do not use infinitive verbs alone, that is, the phenomenon of RIs is not found in early Italian.

## 1.6    Why aren't there any root infinitives in early Italian?

The failure to use infinitive verbs as RIs has been linked to the fact that Italian is a null subject language. Wexler (1994, 1998) proposed an account in which this link is direct. Rizzi (1993/4), instead, offered a proposal mediated by movement properties of Italian verbs.

Wexler's (1998) account is built around three constraints listed below:

(19)  *Minimize violations*

Choose the representation that violates as few grammatical constraints as possible. If two derivations violate the same number of constraints, either one can be chosen.

(20)  *Tense Constraint*
      Every main clause includes a tense feature.

(21)  *Unique Checking Constraint (UCC)*
      A subject DP can only check the D-feature of one node, either T or AgrS.

Along with seminal work by Pollock (1989) and Belletti (1990), the clausal structure on Wexler's account includes two phrases, i.e. tense and agreement. These phrases are both endowed with uninterpretable D-features, which must be checked against the D feature of the subject, DP. Thus, the subject must raises to Spec TP and then to Spec AgrSP to check its D-feature. As, in child grammar (but not in adult grammar), *UCC* holds, children can generate sentences in which the tense phrase is absent and thus generate sentences with a RI. In so doing, they abide by the *UCC*, but violate the *Tense Constraint*. Alternatively, children can choose

to generate sentences including finite verbs, hence with a tense specification. TP and AgrP will both be present and the subject DP will have to check the D-feature twice. In this way, children produce an adult correct sentence, but violate the *UCC*. Whatever path they pursue, i.e. build a representation without TP and including a RI or one with TP and including a finite verb, they violate one constraint. Given Minimize violations, children are free to choose either solution and thus to optionally generate RIs. This is summarized in (22):

(22)  a.  Root infinitive clauses: clauses without TP; violation of the Tense constraint; only one D-feature has to be checked by the DP subject, the one of AgrS. UCC is satisfied.

     b.  Finite clauses: clauses with AgrSP and TP; there are two D-features to be checked; violation of the *UCC*. Tense constraint is satisfied.

RIs are not found in Italian because AgrSP, in a null subject language, is pronominal and does not have an uninterpretable D-feature. Thus, the representation of a finite sentence in Italian does not violate any constraint. Most notably UCC is satisfied as there is only one D-feature to check. Given Minimize violations, this representation is chosen over the representation, which includes a RI and that, instead, violates one constraint (the tense constraint). In this approach, the lack of RIs in Italian is due to the pronominal properties of the AgrS node, which licenses null subjects.

    The approach advanced by Rizzi (1993/4), instead, is built around two constraints.

(23)  *Constraint on the root of the clause*
CP is the root of every clause

(24)  *Constraint on Tense specification*
If a clause includes tense, this must either be referential or anaphoric. Anaphoric tense must be identified sentence-internally.

All clauses are CPs in the adult grammar, but not in the child grammar, where the constraint in (23) is optional. This means that children can truncate structures below CP and generate clauses that do not have the whole set of functional categories. Given a structure as in (25), truncation can apply below CP or below AgrSP. The resulting clauses would include all layers below AgrSP and TP, respectively. In either case, TP would be present and the structure would have to include a referential tense, i.e. a finite verb with tense specification; otherwise, the constraint on tense specification in (24) would be violated. If truncation applies below TP, a VP clause is generated. In this case, no TP is present and the constraint in (24) is not enforced.

(25)

```
              CP
              |
            AgrSP
          /       \
       Spec      AGRs'
              /        \
           AgrS         TP
                      /     \
                   Spec      T'
                           /    \
                          T      VP
                                /\
```
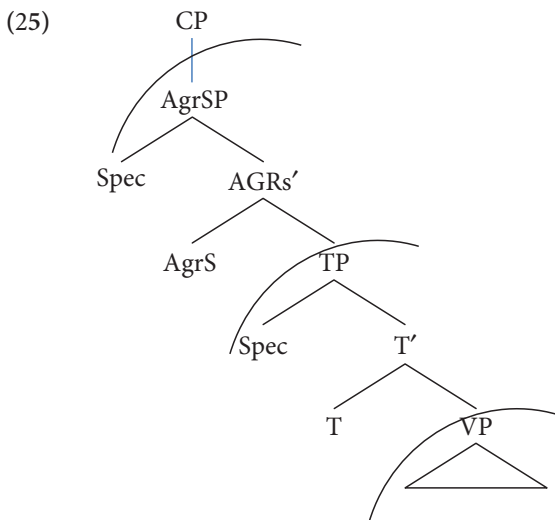
Rizzi claimed that RIs are truncated structures that include neither AgrSP nor TP, but only some functional layer just above VP that can accommodate infinitive verbs. Typically, an infinitive verb is embedded under a finite verb, because its tense is anaphoric and is identified by the tense of a finite verb, according to (24). Truncating infinitive clauses at the VP level strip the TP level away, and in this way, the constraint on the identification of anaphoric tense is voided. Truncating at the VP level ensures that (24) does not apply, but this move is available only in languages in which infinitive verbs do not move out of the VP, as in French, English and so on. Italian infinitive verbs, like finite verbs, raise from V to T to AgrS (Belletti 1990) and thus cannot be accommodated within VP. Truncating an infinitive clause at the AgrSP level is not an option, as the clause would include TP and hence an anaphoric tense. The Constraint on the identification of anaphoric tense would be enforced, but, as no identifier is available sentence internally, an ungrammatical structure would ensue. In this approach, RIs are impossible in Italian, because infinitive verbs, like finite verbs, must raise as high as AgrS due to the fact that AgrS is strong or rich in Italian.

## 1.7   Imperatives as the Italian analogue of root infinitives

Although Italian does not display a proper RI stage, Italian-speaking children go through a stage in which they use a verbal form that share properties with RIs: the second person singular of the imperative form (Salustri & Hyams 2003, 2006, 2007). Before examining this claim and the evidence in its favor, one needs to know that, in Italian, the second person of the imperative is homophonous to either the third or the second person singular of the present indicative (the second person plural of

the imperative is always homophonous with the second person plural of the present tense). This is illustrated in Table 1.5 for each conjugation.

**Table 1.5.** Imperatives and the homophonous forms for the three conjugations

|  | first conjugation | second conjugation | third conjugation |
|---|---|---|---|
| Imperative | parl-a! | rid-i! | part-i! |
| Homophonous form | third person present tense (*lui parla*, 'he speaks') | second person present tense (*tu ridi*, 'you laugh-2sg') | second person present tense (*tu parti*, 'you leave-2sg') |

Thus, to establish whether a verb form is imperative or indicative present tense, an analysis of the context is compulsory. Although imperative and indicative present tense verbs are homophonous, their syntactic behavior is not the same. For example, clitics follow imperative verbs (as in all Romance languages), that is, they are enclitics, but precede present tense verbs, that is, in this case, they are proclitics. This is illustrated in (26).

(26)   a.   Mangia-**lo**                         imperative
            eat-2sg-it
            'Eat it'

       b.   Lui **la** mangia                     present indicative
            he it-fem-sg eat-3sg
            'He eats it'

The second person singular of imperative verbs cannot be negated. The negative imperative is expressed by a negative infinitive, as seen in (27).

(27)   a.   *Non mangia-**lo**
              Not eat-2sg-it

       b.   Non mangiar-**lo**
            Not eat-INF-it

With these facts in mind, let us examine the distribution and use of imperative verbs by Italian-speaking children. Imperative verbs are among the first verbal forms to emerge (Pizzuto & Caselli 1992). Salustri and Hyams (2006) examined the transcripts of 4 children between 2;0 and 2;7 (Martina, Diana, Viola in CHILDES, Denis in Leonini (2002)). They found that the use of imperative verbs varied between 16% and 31%, while that of RIs was at most 3%. Adult speakers of Italian also used imperatives but, in their child-directed speech, the highest rate was 15% and in their adult-directed speech was 6%. Thus, children seem to use imperative with a higher rate (31%) than adults (15%).

Imperative forms of the three conjugations are all attested in early Italian, although the first conjugation is overrepresented, as it has more verbs. Table 1.6 reports the

percentages of imperative verbs, across the three conjugations in the speech of one child, Diana.

**Table 1.6.** Frequency and percentage of imperative forms for the three conjugations in the speech of a typically developing Italian-speaking child. Spontaneous data from CHILDES; data elaborated by Salustri and Hyams (2006)

| Age of Diana | first conjugation | second conjugation | third conjugation |
|---|---|---|---|
| 1;8–2;6 | 144 (66%) | 43 (25%) | 14 (8%) |

The fact that children produce imperative verbs of all three conjugations is an important piece of data. Recall that in the first conjugation, the imperative second singular verbs and the indicative present third person verbs are homophonous. Thus, the use of imperative verbs in the other two conjugations is a hint that children are not overusing the present third person, but producing imperative forms.

In Table 1.3 from Caprin and Guasti (2009), we have observed that imperative verbs increase in G2 (2;4) and decrease in G3 (2;6) supporting the idea that there is overuse of imperative verbs in G2. One can better appreciate the claim that imperative verbs are the analogue of RIs by examining the phenomenon in a cross-linguistic perspective. In early German, in contrast to early Italian, there is no overuse of imperative verbs (and these represent 10% of all verbal utterances), in spite of the fact that in German child-directed speech one finds a lot of imperative verbs, i.e. between 32% and 61% (Salustri & Hyams 2006). On the one hand, Italian-speaking children use imperative verbs more frequently than their caregivers; on the other hand, this use is higher in early Italian than in other early non-null subject languages, like German. These two pieces of data provide evidence for the claim that imperative verbs have a special status in Italian child language.

In spite of the overuse of imperative verbs, Italian-speaking children distinguish imperative verbs from present indicative verbs. This can be appreciated by looking at the distribution of clitics with respect to verbs, as we saw earlier. Clitics are not abundant in the first transcripts. However, they are placed correctly, i.e. they are enclitic with imperative verbs and proclitic with the indicative present tense verbs, as seen in (28):

(28)  a.  dam**mi** (Diana, 1;8)                          imperative
           give-to+me
           'give to me'

      b.  metti**lo** (Diana, 2;1)                         imperative
           put-it

      c.  **ti** metto le scarpe (Diana, 2;6)              present tense
           to+you (I) put the shoes
           'I put you on the shoes.'

The syntactic distributional evidence and the proportion of use of imperative verbs by children compared to the same use by adults led Salustri (2003), Salustri and Hyams (2006) to claim that Italian-speaking children use imperatives as the analogue of RIs in other languages (the *Imperative Analogue Hypothesis*). Salustri and Hyams went on to show that Italian imperative verbs, by their intrinsic nature, display some of the typical interpretative properties that have been associated with RIs in other early languages and that are listed below:

(29)  a.  The majority of RIs have a modal or irrealis meaning, that is, they express the intention to bring about a state of affairs that is unrealized at the speech time

   b.  RIs are based on eventive predicates (Hoekstra & Hyams 1998)

   c.  RIs are tenseless root clauses

   d.  RIs arguably lack agreement in that in the relevant stage Italian-speaking children only use second person singular imperative verbs.

Let us comment on the properties in (29) and see how they hold for RIs and for imperative verbs. In early languages, many RIs have an irrealis/modal meaning (e.g. Wijnen 1998; Becker & Hyams 1999). Berger-Morales, Salustri and Gilkerson (2005) showed that, in the speech of a bilingual German-Italian child, Leo, 89% of his German RIs has an irrealis/modal meaning. In conformity with (29a), this same meaning is expressed by imperative verbs, both in the child's and adult's speech. Salustri and Hyams (2006), drawing on Han (2001), offered the following description of the imperative: 'a form that is marked with an irrealis feature that contributes an unrealized mood interpretation, and a directive feature encoding directive illocutionary force (or obligation).'

The majority of RIs are based on eventive verbs (Wijnen 1998; Hoekstra & Hyams 1998; Becker & Hyams 1999), while finite verbs can be either eventive or stative (cf. Berger-Morales, Salustri & Gilkerson 2005), as stated in (29b). Interestingly, verbs used in the imperative mood can only be eventive and this restriction is observed also by children. Stative verbs cannot be used in the imperative mood (*conosci Maria 'know Maria' is ungrammatical), as stated in (29b).

RIs are tenseless, as stated in (29c), and the same holds for imperative verbs, as they do not display present/past oppositions. Finally, the way children use imperative verbs leads one to conjecture that they are deprived of true agreement, as in the relevant period, only the second person singular and not the plural one is present in the speech of Italian-speaking children. Thus, RIs and imperative verbs display the same properties in child speech. The difference between RIs and imperative verbs is that the former are not grammatical in the adult language, while the latter are and precisely with the properties listed above. Therefore, the resemblance of imperatives to RIs has gone unnoticed.

The evidence that the imperative form is the analogue of RIs is: (1) the fact that there is a decrease in the use of imperative verbs in early Italian, as we said earlier, and (2) the cross-linguistic difference in the use of imperative verbs in early languages. In fact, imperative verbs are found in early Italian, but not in early German. Salustri and Hyams (2006) underscored that imperative verbs and RIs are distinct in early grammar. While RIs convey various modal meanings (volition, future/intention, and obligation), imperative verbs express only one of those meaning (obligation). However, they have in common the irrealis feature (see also Han 2001 and see above), that is, they refer to events that are not realized at the speech time. Under this view, we can conceive of the RI stage as follows. Between 2;0 and 3;0 years, children speaking a variety of languages produce verbal forms displaying the properties in (29). In languages such as French or German, the verbal form, which best satisfies (29), is the infinitive verb, while in Italian, it is the imperative verb. When children grow older, a significant portion of these forms, RIs or imperative verbs, gives way to modals (Blom 2003); hence, the observed decrease of these forms in child speech and their replacement with modals.

The next question is why children use RIs or the imperative verbs in contrast to other verbal forms. Salustri and Hyams (2006) propose that the core property of RIs is the expression of the irrealis meaning. In the adult language, this meaning is expressed through modals and thus, require the use of complex structures, which are either unavailable to children or exceed their capacity. Therefore, to express this meaning, children choose a verbal form that is compatible with this meaning and has a reduced or economic structure. In languages such as French or German, the infinitive verb satisfies these requirements as it does not raise and can be accommodated by a VP, as proposed by supporters of the truncation approach. In Italian and other null subject languages, infinitive verbs raise to AgrP and thus they cannot be accommodated by a reduced structure. According to Salustri and Hyams (2006), in these languages, the most economical structure is the imperative. Let us see why. Salustri and Hyams (2006) held that the imperative has to check a mood (irrealis) and a Force feature (obligation), which are generally checked in left periphery of the clause. Under this view, an imperative clause is likely to project the whole structure up to CP. Thus, it doesn't seem to be an economical structure, at first sight. However, given the morphosyntactic properties of Italian, only the imperative clause can express the irrealis mood. This clause can be regarded as an economical structure, with respect to present tense clauses, because it is tenseless. One way to formally implement this view is to say that an imperative clause projects up to the CP, but does not include TP. Alternatively, Salustri and Hyams (2006), along the lines of Belletti (2004), suggested that, in the lower part of the clausal structure, there is a counterpart of the left periphery. Belletti (2004) argued that there is a Focus phrase to accommodate the post-verbal subject. However, a focus phrase is also present in the left periphery of the clause, although

with a slightly different meaning (contrastive). We know that Italian allows both left and right dislocation. This means that there may be a topic position both to the left and to the right of the clause, as in Belletti (2004) vP's periphery. One can conjecture that there is a Mood Phrase, just above the VP. Under this view, the imperative could be accommodate by a reduced structure, obtained via truncation and including a lower MoodP and a VP.

## 1.8    Copula

### 1.8.1    Descriptive facts and generalizations

The present tense copula form *essere* (BE) is among the first verbal elements produced by Italian-speaking children (D'Odorico & Carrubbi 1997), being already present at 1;4 (Pizzuto & Caselli 1992). Some authors argued that schwa-like vocalic segments in front of adjectives are to be considered as antecedents of the copula form (Bottari, Cipriani & Chilosi 1993/4; see also the Chapter 2 on articles, Section 2). As with the other verb inflections, the acquisition of the copula form measured in terms of 90% correct takes some times. The third person singular is acquired between 2;0 and 2;6 by the children examined in Pizzutto and Caselli (1992). In the cross-sectional study by Caprin and Guasti (2009), the third person singular and plural forms of the copula are already present in the speech of children in G1 and this use gradually increases across the other two groups. Table 1.7 provides a breakdown of the percentages of correct use of the copula.

**Table 1.7.**  Percentage of use of the copula in 59 typically developing Italian-speaking children divided in three groups according to their MLU. Semi-spontaneous data from Caprin and Guasti, (2009)

| Groups/Age/Number | third person singular | third person plural |
|---|---|---|
| G1/2;3 (N = 15) MLU:1.0–1.5 | 64% | 33% |
| G2/2;4 (N = 19) MLU:1.5–2.0 | 76% | 69% |
| G3/2;6 (N = 25) MLU:2.0–3.1 | 85% | 79% |

It is evident that the singular form is used more frequently than the plural one, an asymmetry that we have already observed in the case of other verb inflections. Agreement errors between the copula form and its subject seldom occur (between

2%–3%), with some substitutions of the third plural marker with the third singular one, a typical error found also with lexical verbs (see Section 3 above). Similar findings are reported in Leonard, Caselli and Devescovi (2002), who additionally showed that 2-, 3- and 4-year-old children were less accurate in the use of the copula form than 5- and 6-year-olds. The errors of these children were either substitutions of the third plural marker with the third singular one or omissions, this option being higher with the third plural marker. Franchi (2006) pointed out that most of the agreement errors were not random, but followed a pattern attested in some adult languages: they were more frequent with third person plural subjects placed in the post-verbal position, as in (30):

(30)  a.  S'è gatti (c'è) (Martina, 2;3)
          There is the cats

      b.  Cos'è quelle? (Raffaello, 2;11)
          What is these?

The same observation holds for finite verbs. Earlier, we pointed out that few errors are found with lexical verbs. For some Italian-speaking children, these errors are found when the subject is post-verbal. Antelmi (1997) noticed that agreement with post-verbal subjects was delayed in the child she investigated. Guasti (1993/4) reported that of the three children she examined, one failed to use agreement between the verb and the post-verbal subject. These facts are not surprising as across languages agreement with post-verbal subjects is more unstable than agreement with pre-verbal subjects (Guasti & Rizzi 2002), with some languages using a reduced form of agreement with post-verbal subjects. For example, in the French example in (31a) the verb agrees only in person, but not in number with the post-verbal subject. Full agreement in person and number is compulsory when the subject is pre-verbal (31b):

(31)  a.  Il **est** arrivé  trois  filles
          It is   arrived three  girls
          'Three girls arrived.'

      b.  Trois  filles **sont** arrivées
          Three  girl          arrived
          'Three girls arrived.'

In some varieties of Italian, like the Marche variety (Cardinaletti 1997), Fiorentino (Brandi & Cordin 1989), agreement with post-verbal subjects only involves person features, like in French, but involves person and number features with pre-verbal subjects:

(32)  a.  Questo, lo **fa**    sempre i    bambini.
          this,   it makes always  the  children
          'This, the children always make it.'

b.  Questo, i    bambini lo **fanno** sempre.
    this,     the children it  make   always
    'This, the children always make it.'

Thus, whatever the reason is for failing to express full agreement with post-verbal sub-jects, the fact that some children tend to use the third person singular marker with plural post-verbal subjects indicates that they are sensitive to the property that regu-lates agreement with pre- and post-verbal subjects.

   Most of the time, when the copula form is used, it is correctly employed; however, along with use, we also observe a large number of omissions and use of the copula increases along with MLU. Some examples of use and omission of copula forms are in (33).

(33)  a.  Quella (è) mucca              (A. 2;4)
          That (is) cow

      b.  Pallo (è) butto              (Raffaello, 1;11)
          Paolo (is) ugly

      c.  C'è il coccodrillo lì         (A. 2;7)
          There is the crocodile there

Franchi (2006) examined the longitudinal production data of 3 children in the CHIL-DES database (Martina, Raffaello and Rosa). She observed that during the first period (age range: 1;7–2;4), the copula is very often omitted (between 50% and 100% of the time), and in the second period (2;05–2;11), copula omission is lower (around 30%). She also pointed out that in a language like Italian, where also subjects can be null, bare predicates are ambiguous between being instances of copula omission or of elliptical phrases. Given the target in (34), we have instances of omission of various elements in (34b, c, d).

(34)  a.  Target:                      Il cappotto è verde
                                       The coat is green

      b.  Copula omission:             Il cappotto verde[3]
                                       The coat green

      c.  Subject omission:            È verde
                                       Is green

      d.  Copula and subject omission: Verde
                                       Green

---

**3.**  This fragment is an instance of copula omission only in certain contexts, such as question-answer pairs. The same string of words can be also be analyzed as a noun modified by an adjective.

Examining separately contexts of copula omission when the subject was present (34b) and when it was missing (34d), Franchi found a higher percentage of omissions in the context of (34d) than of (34b) (53% vs. 34%), i.e. the copula tended to be omitted more often when the subject was also omitted. Next, she examined copula omission in declarative sentences and in *wh*-questions. She virtually found no omission all along the period investigated (1;7–2;5) in *wh*-questions, while omissions were well attested in declarative sentences, as we already discussed. Caprin and Guasti (2006) confirms this asymmetry between declarative sentences and *wh*-questions based on the speech of 59 children.

Another asymmetry in copula omission is observed in Moscati (2006). He examined the longitudinal transcripts of 11 Italian-speaking children aged from 1;5 to 3;3 (the transcripts of one child, Elisa, were made available by Flavia Adani, and the other 10 children's transcripts are available through CHILDES), and observed 63 negative sentences. Children did not omit any copulas in negative sentences, although they omitted the copula in main declarative positive sentences. According to Moscati's (2006) observation, copula omission in positive contexts ranges from 49% to 81%. Examples of copula use in negative sentences are given in (35):

(35)   a.   que'(sta) non è una strada (Rosa, 3;3)
            This not is a street

       b.   Non c'erano piò (più) i pesci (Raffaello, 2;11)
            not there were anymore the fish
            'There were no fish anymore'

This observation can be fully appreciated if it is put in a cross-linguistic perspective. Moscati (2006) pointed out that copula omission in negative contexts was indeed observed in the speech of English- and German-speaking children. In the transcripts of 5 English-speaking children (data available through CHILDES database), the copula was omitted 68% of the time in negative contexts and around 50% of the time in positive contexts in the period of highest omission of the copula (about 2;0–2;6 for 4 children and 2;7–3;4 for one child). In German, copula omission was 28% in the corpus of two children. Thus, copula omission in positive contexts is found in early English, German and Italian. By contrast, in negative contexts, it is only found in early German- and English.

In summary, copula is used early, and its use increases with children's MLU. A singular/plural asymmetry is found, as in the case of lexical verbs. Omissions are observed, but these are sensitive to the structural environment: copula omission is found in declarative sentences, but virtually never in *wh*-questions, even when criteria of productivity are taken into account. In addition, cross-linguistic variations are observed in copula omission in negative contexts, with no omission

in Italian. The following Sections 8.2 and 8.3 indicate possible accounts for the described generalizations.

### 1.8.2 An account of the declarative versus *wh*-question asymmetry in copula omission

We start by discussing an account of the declarative sentence versus *wh*-question asymmetry in copula omission. Franchi (2006) offered a proposal in terms of Rizzi's mechanism of Truncation (1993/4) described above. The proposal goes as follows. The copula expresses tense and agreement. For this reason, it has been assumed that it is generated directly in T. Thus, structures missing the copula can be analyzed as reduced structures with truncation removing the CP, AgrSP and TP layer. On this view, the structure of a sentence like (36a) is (36b) with truncation applying at the AP level. In this structure, the TP layer is removed and the clause does not have any tense specification and no constraint on tense specification is violated.

(36)   a.   Pallo (è) butto (Raffaello, 1;11)
            Paolo (is) ugly

   b.
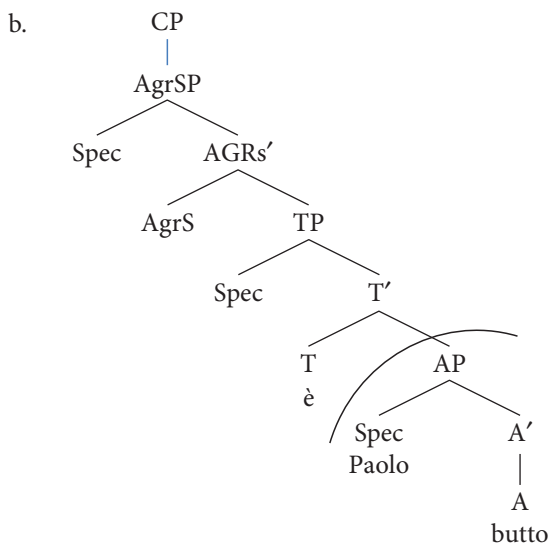


Truncation of the AgrS/TP layers cannot apply in *wh*-questions because the CP layer is needed to host the *wh*-element and thus the full structure below CP must be projected. Since AgrS/TP are present and there is no way to identify an anaphoric tense clause internally, as we are dealing with main clauses, T must be filled, and thus the copula must be produced.

In sum, structures with copula omission are obtained by the same mechanism through which RIs are generated in other early languages.

### 1.8.3 The copula in negative contexts

The asymmetry observed in negative sentences between Italian, on the one hand, and English and German, on the other, can be accounted in terms of the truncation approach. Moscati (2006, 2010) built his account on well-discussed ideas concerning the location of the NegP, the projection hosting negation, in the clausal architecture (see also Laka 1994; Zanuttini 1997). The location of NegP is ruled by a parameter, whereby NegP is higher than TP in Italian, while it is lower in English and German. Thus, in Italian, negative sentences must project at least as far as NegP, to include negation, as in (37):

(37)

```
              AgrSP
           ／      ＼
        Spec       AGRs′
                ／      ＼
             AgrS       NegP
                      ／    ＼
                  Spec      Neg′
                         ／     ＼
                       Neg       TP
                       non    ／    ＼
                           Spec      T′
                                  ／     ＼
                                 T        AP
                                 é      ／   ＼
                                   Spec      A′
                                            │
                                   Paolo      A
                                           brutto
```
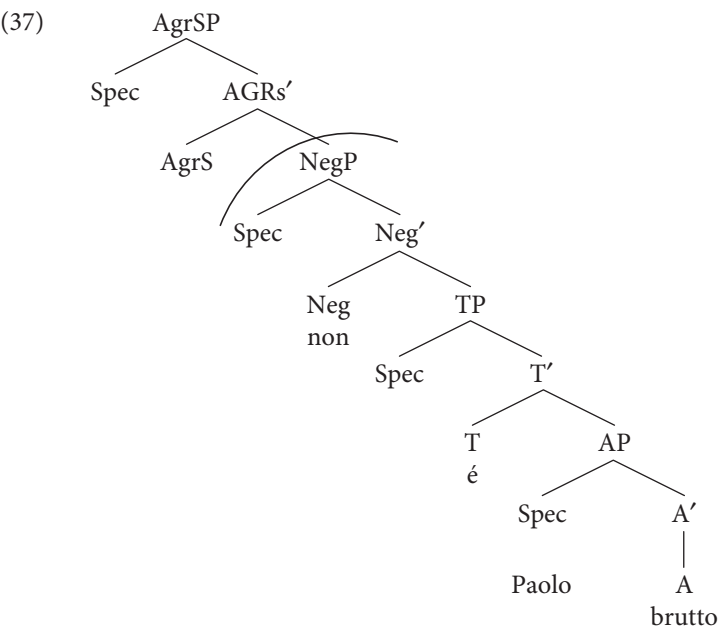
Truncation at the NegP level would strip AgrSP away, but leave TP in the structure, which being present must either be identified sentence internally or be filled with an expression of tense, i.e. the copula, as discussed earlier. As the first option is not available, for the reasons outlined above, negative sentences in early Italian must include the copula inserted under TP, otherwise a violation of the constraint requiring that every clause contain a tense specification would be incurred.

Moscati did not discuss the fact that in negative copular sentences AgrSP is stripped out. The lack of AgrSP has consequences, as one would expect agreement not being fully expressed in negative copular sentences. This could happen if children used

the third person singular (which in Italian is a default) in negative contexts regardless of the singular or plural nature of the subject, while they would not do so in positive contexts. It is unlikely that this prediction is satisfied, as there are very few errors of commission in the use of agreement on the copula, as we said earlier. However, it remains to be tested. If negative copular sentences include not only TP, but also AgrSP, one has to justify why it is so. One possibility is to assume that NegP in Italian is even higher than AgrSP (see Zanuttini 1997).

Let us return to English and German. In these languages, NegP is below TP. Thus, truncating the structure at the NegP level, which is necessary to accommodate the negation, allows children to strip out the TP level, and this would allow children to omit the copula, without violating the tense constraint. Hence, negative copular sentences can feature copula omission in these early languages.

In summary, whether negative copular sentences feature copula omission or not depends on the location of NegP relative to TP in the clausal structure in a given language.

## 1.9 Compound tenses and optional past participles

The verb BE is used not only as a copula, but also as an auxiliary, to which we now turn our attention, considering it in conjunction with the auxiliary HAVE.

The copula emerges earlier than the auxiliary BE (Antelmi 1997), but this may depend on the fact that auxiliaries are used in compound tenses, which emerge later than the present tense. Moreover, as in the case of the copula, we observe optional use of auxiliaries in the early transcripts. Uses and omissions of auxiliaries are exemplified in (38) (from Caprin & Guasti 2009):

(38)  a.  è caduta                                          (Alessia)
          (she) is fallen-fem-sg
          '(she) fell.'

      b.  hanno mangiato                                    (Anna)
          (they) have eaten
          '(they) ate (it).'

      c.  dopo (sono) andati tutti        in spiaggia eh!   (Carlo)
          after (they) (were) gone-masc-pl  all to beach eh!
          'then all (they) went to the beach eh!.'

      d.  ecco  (la)            (ho)    messa               (Giulio)
          there, (it-acc-fem-sg) (have)  put-fem-sg
          'There (I) put (it).'

As in the case of the copula and other lexical verbs, agreement errors with auxiliaries are rare (3%). However, omissions are abundant. In Table 1.8, we report uses of copula

**Table 1.8.** Percentage of use of the copula and of the auxiliaries in 59 typically developing Italian-speaking children divided in three groups according to their MLU. Semi-spontaneous data from Caprin and Guasti, (2009)

| Groups/Age/Number | Copula (third sg and pl) | Avere (have) | Essere (be) |
|---|---|---|---|
| G1/2;3 (N = 15)<br>MLU:1.5–1.5 | 64% | 25% | 33% |
| G2/2;4 (N = 19)<br>MLU:1.5–2.0 | 76% | 55% | 58% |
| G3/2;6 (N = 25)<br>MLU:2.0–3.1 | 85% | 58% | 64% |

forms (these are the same data reported in Table 1.7, but collapsing together singular and plural), and of the two auxiliaries (all persons are conflated) based on the corpus of 59 children from Caprin and Guasti (2009). In these counts, cases in which BE is ambiguous in that it can be either an auxiliary or a copula form are not included. We will return to these instances in Section 12.

It is evident that the copula is used more frequently than the auxiliary BE, which is used as much as the auxiliary HAVE. In addition, while there is steady development in the three groups as far as the copula is concerned, there is no significant development in the use of the two auxiliaries across the three groups. In this case, the standard deviations are very large, indicating that there is huge variation among children in the groups and this is responsible for the absence of a statistically significant difference among the three groups. These outcomes indicate that children distinguish copula BE from auxiliary BE and put the auxiliaries BE and HAVE together. This finding has been replicated in other early languages (English, see Cleave & Rice 1997; Joseph, Serratrice & Conti-Ramsden 2002; French, see Jakubowicz & Nash 2001) and is a hint that phonological similarity does not help children in the generalization of the use of BE and consequently phonological weaknesses are hardly to be the cause of children's omission of BE. Children distinguish copula forms from auxiliaries. However, both are omitted, although for different times and at different rates.

Hyams and Schaeffer (2007) pointed out another property of auxiliary omission in Italian, based on the speech of a child, Diana, whose transcripts are included in CHILDES (age range 1;8–2;6). They showed that Diana optionally omitted auxiliaries when the lexical verb was telic (e.g. *cadere* 'fall', *prendere* 'take', *chiudere* 'close'). With non-telic predicates (e.g. *venire* 'come', *scappare* 'run away'), auxiliaries were not omitted. If this finding is confirmed by the production of other children, it would add an important dimension to the phenomenon of optional auxiliary omission.

Let us now move on and explain auxiliary omission. Drawing on Franchi (2006), we have explained copula omission in terms of truncation of the clausal structure, so that the TP layer is not projected. Following and slightly modifying Caprin and Guasti's (2009) proposal, we extend the truncation approach to auxiliary omission. Under the assumption that auxiliaries are generated in T, utterances like (38c, d) are to be analyzed as truncated structures at the level of the projection hosting the past participle, say AgrOP, as shown in (39).

(39)

```
                    TP
              ┌─────┴─────┐
            Spec          T′
                     ┌────┴────┐
                     T       AgrOP
                          ┌────┴────┐
                        Spec       AgrO′
                               ┌────┴────┐
                             AgrO        VP
                             messa   ┌────┴────┐
                                   Spec        V′
                                          ┌─────┴─────┐
                                          V
                                      <messa>
```
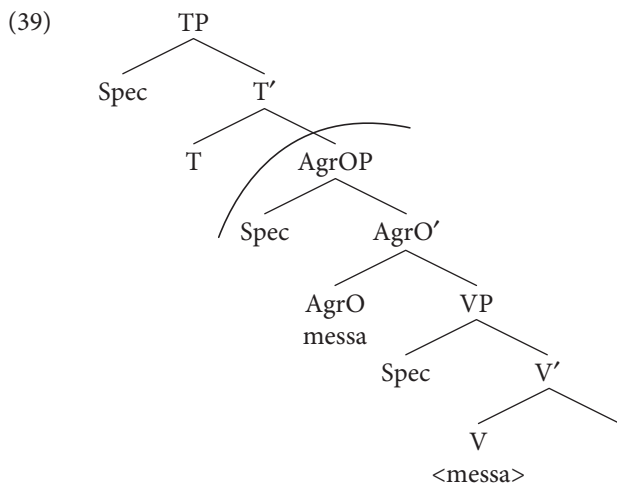
The past participle verb is generated in V and moves to AgrOP to check agreement feature (if these are present) or to be suffixed with the participle inflection. In child language (as in adult language), past participles display agreement with the internal argument, as seen in (38a, c). In these examples, the past participle of the unaccusative verbs *cadere* 'fall' (*caduta* 'fall-FEM-sg') and *andare* 'go' (*andati*, 'gone-MASC-pl') agrees in number and gender with the single internal argument of the verb. Further evidence in the same direction is offered by Leonard and Bortolini (1998). Looking at the feminine and plural past participles produced by 25 children aged 4;0–7;0, these authors found that past participle agreement with unaccusative verbs was correct (94% accuracy in children with SLI and 100% in control children). Past participle agreement also shows up when the object is expressed by a clitic. In this case, children produce past participle agreement, as in (38d), where the understood object is missing (see Chapter 3, Section 2.3 on past participle agreement with clitics).

Although the truncation account explains auxiliary omission, it does not account for the different pattern and rates of omission of the copula and of the auxiliary BE (and HAVE). It must be the case that some inherent properties distinguish auxiliaries from copula, however. Auxiliaries are employed in compound tenses, such as the

*Passato Prossimo*, and contribute to the expression of tense (and agreement) features in conjunction with the past participle. In other words, in compound tenses, tense is expressed by two distinct items (e.g. 'has' is just present, but 'has talked' is past). By contrast, the copula by itself expresses tense (and agreement) features (e.g. 'is' is present and 'was' is past). Caprin and Guasti (2009) argued that this difference in the expression of tense (and agreement) features is responsible for the different developmental pattern of the copula and of the auxiliaries in children' speech. Building on Jakubowicz and Nash (2001), they claimed that children omit auxiliaries more frequently than the copula, because their use involves a more costly syntactic computation than that of the copula. Since tense in compound tenses is expressed by two items (the auxiliary and the past participle), more computational resources are required than in copular sentences and this leads children to omit auxiliaries more often than copula forms.

Wexler (1998) has sketched an alternative explanation of auxiliary omission in the article cited above on RIs (or OIs). According to Wexler, clauses lacking an auxiliary and featuring only the past participle are finite clauses (in which T has been checked), but the auxiliary must be missing, because it has a finiteness feature that cannot be checked due to UCC. However, it is not clear that this approach can explain the asymmetry between copula and auxiliary omission (see Hyams & Schaeffer 2008, for criticism of this view). The truncation account plus the computational complexity assumption associated to compound tenses explains the higher omission of auxiliaries compared to that of the copula. However, it does not account for Hyams and Schaeffer (2007)'s observation that bare past participles are typically found with telic verbs. To account for this additional property, we need to further assume with Higginbotham (2000) that telic predicates have two event variables, while non-telic ones have only a single variable. Since past participles are perfective, they denote closed events; hence, the first event variable of telic predicates and the single event variable of non-telic predicates are closed. Non-telic past participles must be accompanied by an auxiliary to ensure their temporal interpretation. Telic past participles, instead, have a second event variable that can be linked to the utterance time, which provides the temporal interpretation of the past participle clause featuring auxiliary omission. Hence they do not need to be accompanied by auxiliaries (Hyams & Schaeffer 2007).[4]

These findings notwithstanding, Berger-Morales and Salustri (2003a, b) pointed out that Italian-speaking children between 2;0 and 2;6 omitted auxiliaries to a lesser extent than their German-speaking peers. They found that monolingual German-

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4.   Notice that there is tension between the idea that auxiliaries are omitted in compound tenses because of higher computational demands and the findings that only with telic predicates auxiliaries are omitted. At present, it seems premature to give up the computational complexity view, because the asymmetry copula versus auxiliary omission calls for it. Future research will have to examine more closely the semantic properties of bare past participles.

speaking children omitted the auxiliaries 96% of the time, while Italian-speaking children did so 22% of the time. A bilingual Italian-German child in the same age range was similar to monolingual children as far as German was concerned, but omitted auxiliaries more often in his Italian (58%) than his Italian monolingual peers. This may be due to the negative influence of German on Italian or to a delay in Italian due to the bilingual situation, an issue that also deserves further and more extensive investigation. This cross-linguistic comparison has to be considered with some cautions, as the data do not come from a controlled experimental situation, but are spontaneous data. Therefore, one cannot be sure that the children involved had a similar level of linguistic competence.

Berger-Morales and Salustri (2003a, b) explained the asymmetry between German and Italian as stemming from movement properties of the verb in the two languages. In Italian, there are two movement options for auxiliary plus past participle: either the auxiliary moves alone to T or it moves there together with the past participle. In the former case, truncation applies, as in (39) and we obtain bare past participles. In the latter, truncation cannot apply as it would result in the loss of the entire meaning of the sentence. In German, instead, there is only one movement option for auxiliaries: they move alone to T and C. Truncation can apply in a larger set of cases and this yields a larger number of bare past participles. We should make precise that, although this explanation retains Berger-Morales and Salustri's insight, it is framed in different terms than theirs, more in line with our previous approach.

## 1.10    Past participles: Verbal or adjectival nature?

As we have just discussed, past participles alone are present from the first productions, but according to Antinucci and Miller (1976), they are categorically adjectives, rather than verbs. This assumption is based on the observation that first past participles are generally used with change of state verbs to describe the end-state, in which an object is found. For example, *la porta è chiusa* (The door is closed) describes the state of the door being closed that results from the action of closing. This claim has been known as the *Aspect First Hypothesis* (AFH), whereby initially children assume that past tense inflections do not mark a temporal relation, but encode aspect. Since then, the AFH has been challenged in various works.

Behrens (1993) showed that German-speaking children were able to refer to past events. Caprin and Guasti (2009) challenged the AFH in another way, although not mentioned in their article. Earlier we observed that copula omission is lower than auxiliary omission (HAVE and BE). In that analysis, ambiguous contexts in which the verb BE was omitted were not counted. These contexts were ambiguous because the past participle could be analyzed as an adjective or as a verb; consequently, the omitted BE could be

the copula or the auxiliary. Caprin and Guasti examined them separately, following this reasoning: if the entity omitted in these ambiguous contexts was an auxiliary, then the omission rate should resemble that observed in cases of auxiliary omission; by contrast, if it was an instance of the copula, it should be like that of the copula omission (see Table 1.8). In ambiguous contexts, omission of BE was found to pattern with auxiliary omission. This suggests that the omitted element is indeed an auxiliary. This result implies that past participles, in those ambiguous contexts, are not adjectives, but verbs, and the claim that past participles do not encode temporal, but aspectual properties, becomes disputable. One cannot maintain that past participles are adjectives and for this reason only encode aspectual distinctions. What exactly they encode is still a matter of debate.

## 1.11    Regular and irregular past participles and past definite

In Section 3, while discussing the acquisition of inflectional rules, we evoked the claim that humans avail themselves of two mechanisms (at least) to deal with language: one for extracting structural regularities and one for performing statistical computation. Following this line of thought, several scholars have favored the *dual-mechanism model* (DMM) to describe how the mental grammar represents morphologically complex words.

In this model, irregular words, which are associatively listed in memory, are subject to frequency effects and to size of inflectional subclasses, and are learned through association. Regular words, instead, are generated on the basis of symbolic operations and thus, acquired through a mechanism that extracts regularities and are not subject to lexical effects (see Pinker 1999; and Clahsen 1999, for reviews). In fact, studies on the acquisition of English past tense have found that children make mistakes and overgeneralize the past tense inflection *-ed* to irregular verbs producing for example *go-ed* and *bring-ed* (Marcus, Pinker, Ullman, Hollander, Rosen & Xu 1992). Additional evidence for the DMM comes from German Clahsen, Rotweiler, Woest and Marcus (1992).

Italian presents an interesting case, as it has three conjugation classes with different rules and properties. Here, we consider two past forms, i.e. past definite and past participle, because these have been the object of inquiry. As we said earlier, conjugation I is the most regular one. Both the past definite and past participle are regularly formed (*parl-a-re*, to speak: past definite *parl-ò,* he spoke; past participle *parl-a-to*, spoken). In II conjugation, they are often irregular (*prend-e-re*, take: past definite *pres-e*, he took; past participle *pres-o*, taken), but there are conjugation specific rules (*tem-e-re*, fear: past definite, *tem-è,* or *temette,* he feared; past participle, *tem-u-to*, feared. *cred-e-re,* believe: past definite: *cred-e-tte*, he believed; past participle *cred-u-to*, believed) and in the III conjugation they are regular most of the time (*dorm-i-re*, sleep: past definite, *dorm-ì*, he slept; past participle *dorm-i-to*, slept).

The DMM leads one to expect application of regular patterns to irregular verbs; for Italian this means that children could produce errors in the formation of II conjugation past definite by using I or III conjugation patterns, according to Orsolini, Fanari and Bowles (1998). Based on these predictions, Orsolini et al. tested Italian-speaking children's production of the past definite tense. Note that that the past definite tense is very rarely used in spoken language in the Northern part of Italy, somewhat more frequent in Central Italy and more frequent in Southern Italy. Often it is learned in school and is part of the written register, especially in Northern Italy. The children in Orsolini et al.' study were from Rome (Central Italy) and thus likely exposed to a variety of Italian where past definite is used in spoken language, at least to a certain extent.

Orsolini et al. invited 100 children aged from 4 to 10 years to produce a narrative using the story *Frog, where are you*? (Mayer 1987). In the final analysis, only children who produced past definite were retained and these were 74 (half of the 4-year olds were discarded, while in the other age ranges at most 25% were discarded). These children produced 1282 past definite forms, 48 of which were errors (i.e. 0.4%) on which the subsequent analysis was based. Four types of errors were found, and two of them were the most frequent ones: pseudo-regularization (24 errors, 50%) and irregularization (11 errors, i.e. 23%). Pseudo-regularizations are forms obtained by the use of a regular conjugation-specific pattern rather than an irregular one (e.g. *cadè* rather than *cadde,* he fell, or *venì* rather than *venne*, he came). Two of these errors were from the III conjugation and the others from II conjugation (of these 17 were with the verb *cadere*, fall). Irregularizations are forms obtained by the overapplication of an irregular inflectional process whereby verbs of the II conjugation undergo a *-s* marked root change (*prend-e-re*, to take becomes *pre-s-e*, took). This process was applied to 65% of the II conjugation verbs. Therefore, *vedere* (see) became *vise* rather than the correct form *vide* (he saw). The other errors were use of the subjunctive (9 examples), which is likely a regional idiosyncrasy, and default regularization, i.e. use of I conjugation suffix for verbs of II conjugation (*cadò* rather than *cadde*, he fell). Thus, most of the morphological errors found results from the application of non-productive and therefore listed morphological processes: either overapplication of the *-s* marked root change or application of a II conjugation pattern with no phonological change. Errors obtained by the use of patterns from the highly productive I (*parl-a-re → parl-ò*, he talked) or III conjugation (with application of the specific rule *part-i-re → part-ì*, he left) were rarely found. Based on these results, Orsolini et al. concluded that the DMM was not supported by Italian data and a single associative mechanism was responsible for the acquisition of regular and irregular morphologically complex forms (see also e.g. Plunkett & Marchman 1996).

Say and Clahsen (2002) challenged this conclusion by pointing out some wrong assumptions. First, they criticized the assumption that productive means rule-based process; and second they pointed out that Orsolini et al. confused "the properties of conjugation membership with those of inflectional processes". The fact that II conjuga-

tion is not productive does not entail the absence of rule-based inflectional processes (past definite of *temere*, fear, and *credere*, believe, are rule based). Reanalyzing Orsolini et al.' data, Say and Clahsen showed that most of the errors produced by children were with irregular verbs and resulted from application of a II conjugation rule to them (*cadé* for *cadde*, he fell). These totaled to 50% of the errors. Interestingly, these errors were not based on phonological similarity and this was expected under a DMM when one uses a regular pattern. The other errors produced (in total 23%) were irregularization, which were based on phonological similarity, as it is expected for irregular verbs under the DMM. Thus, the data offered by Orsolini et al. are not against the DMM, but in line with it, once incorrect assumptions are removed.

An additional finding of Orsolini et al.'s article was that regularizations across conjugation classes (use of I conjugation rule) were rare and were only found in the youngest children, in line with the idea that children distinguish among conjugation classes. A second task based on a sentence completion task, in which children (aged 5, 6 and 8) were invited to complete the sentence with past definite of irregular verbs from the II and III conjugation class confirmed this finding. Regularizations of II conjugation verbs with I conjugation suffix or with II conjugation specific rule (*cadé* for *cadde*, he fell) accounted for 92% of the errors. The remaining 8% errors were irregularizations. In this study, the production of past participles from II and III conjugation was also tested. Remember that many II conjugation past participles (*prese*, taken) are irregular. In this case, children were highly accurate with more than 90% correct responses, suggesting that by age 5 children have acquired both regular and irregular past participles. This is not surprising given that these forms are used very early and are very common in spoken language (see also Colombo, Laudanna, De Martino & Brivio 2004 for additional discussion).

In sum, Italian-speaking children have a double representation of morphologically complex words: regular words are derived by a symbolic rule, while irregular ones are listed.

## 1.12    The 'imperfetto'

In Section 1, we noticed that the present tense and the imperative appear earlier than other tenses in children' speech. As we have just seen, past participles are also used early and gradually, they are introduced by auxiliaries, to express compound tenses, as the *passato prossimo*; according to some studies the *imperfetto* appears around age 2;0, but with an incorrect meaning (deictic past) (Calleri et al. 2003). Other studies show that it appears around age 2;6 (Antelmi 1997). The *imperfetto* seems to be used less frequently than the *passato prossimo*. As we already pointed out, a careful investigation would be necessary to obtain a clear picture of the use of the *imperfetto*.

The fact that the *imperfetto* may be problematic for children is confirmed by experimental investigations on the comprehension of tense. Van Hout and

Hollebrandse (2001) and van Hout (2008) carried out an investigations on Italian-speaking children's interpretation of the two past tenses, *passato prossimo* and *imperfetto*. In these experiments, a story was played in front of the child. The characters were first presented to the child, who was told what they were doing (A is washing B). Then, the curtains were drawn and something happened behind them, which couldn't be seen by the child. A puppet was allowed to see what happened behind the curtains and was then asked by the experiment to say what he had seen, using either (40a) or (40b):

(40)  a.  Carlo  ha   costruito  un  castello       *passato prossimo*
          Carlo  has  built      a   castle
          'Carlo built a castle'

      b.  Carlo  costruiva un castello              *imperfetto*
          Carlo was building a castle

Then, the child was shown two pictures, one depicting an ongoing event and one a completed situation, as in Figures 1.1a and 1.1b. The child had to choose the picture matching the sentence uttered by the puppet (either (40a) or (40b)).
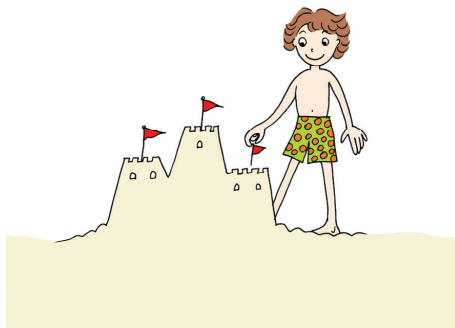


**Figure 1.1a.** Completed event
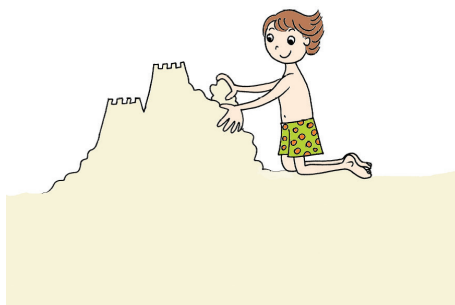


**Figure 1.1b.** Ongoing event

Results from van Hout (2008) showed that adult controls matched the ongoing event with (40b), the *imperfetto*, and the completed event with (40a), the *passato prossimo*. This means that adults, as expected, know the entailment carried out by the *passato prossimo,* called the *completion entailment*, whereby the event described by this tense has to be completed. Unlike adults, at age 3;0, children scored at chance both with the *passato prossimo* and the *imperfetto*. In the same experiment, Polish- and Dutch-speaking children were also tested. These children did not score at chance with the equivalent of *passato prossimo* (present perfect) in their language, but matched the heard sentence with a completed event, that is, they displayed knowledge of the completion entailment. Thus, at 3;0 years, Italian-speaking children do not map the *passato prossimo* to its meaning, while Dutch- and Polish-speaking children do. Like Italian-speaking children, Dutch- and Polish-speaking children were at chance with the *imperfetto*.

In another study, using the cross-sectional method, but only with Italian-speaking children, Van Hout and Hollebrandse (2001) obtained chance performance in the comprehension of the *passato prossimo* at age 3;0 (as in Van Hout 2008). In addition, they showed that from age 3;0 to 4;0 to 5;0 there was a steady improvement and 5-year-olds chose the correct picture 92% of the time when they heard a sentence including the *passato prossimo*, that is, at age 5;0, Italian-speaking children have acquired the completion entailment of the *passato prossimo*. Interestingly, at the same age, only 58% correct answers were found for sentences including the *imperfetto* and no improvement was observed from age 3;0 to 5;0 in the comprehension of the *imperfetto*.

From Fiorin (2010), we know that at 9;3 years of age, Italian-speaking children have acquired the meaning of the *imperfetto*, as they answer correctly 88% of the time in an experiment similar to the one carried out by Van Hout (2008). Since there is no experiment involving children aged 5;0 to 9;0, we do not know when knowledge of the *imperfetto* is first manifested. This array of results indicate, on the one hand, that Italian-speaking children are delayed with respect to Polish- and Dutch-speaking children in the acquisition of the meaning of the present perfect or *passato prossimo*; on the other, they have trouble with the *imperfetto* up to age 5.

To explain the fact that 3-year-old Italian-speaking children did not know the completion entailment of *passato prossimo*, Van Hout (2008) proposed the *Morphological salience hypothesis* (MSH), whereby the semantics of morphological salient paradigms are acquired earlier or the form/meaning mapping is easier when the morphological paradigm is salient. Salience here refers to the fact that the relevant verb inflections somehow stand out from other verb inflections. In fact, the present perfect inflections differ from all the other inflections in Dutch and Polish, in that they appear on the left of the verb stem, rather than on the right, where all the other verb inflections are found. This location is what makes these inflections salient or sets them apart from all the other verb inflections. The example in (41) and (42) illustrate these

properties of perfect inflections. In Dutch, the present perfect is formed like in Italian, with an auxiliary followed by a past participle. Interestingly, the morpheme that marks the past participle is a prefix '*ge*', as shown in (41). In Polish, all verbs are either perfective or imperfective. Morphologically simple verbs are imperfective, while perfective are obtained through prefixation, as shown in (42).

(41)  Dutch
      ge-bouw-d

(42)  Polish

| Perfect present | Imperfect |
| --- | --- |
| z-bud-uje (I have built) | bud-uje (I was building) |
| z-bud-ujesz (you have built) | bud-ujesz (you were building) |
| z-bud-uje (he has built) | bud-uje (he was building) |
| z-bud-ujemy (we have built) | bud-ujemy (we were building) |
| z-bud-ujecie (you have built) | bud-ujecie(you were building) |
| z-bud-uja (they have built) | bud-uja(they were building) |

It is this peculiar location of the perfect inflections (prefix) that makes them be tracked more rapidly by children and facilitates the form-meaning mapping. In Italian, verb inflections are all suffixes. The past participle used in the *passato prossimo* is obtained by suffixation of -*to* (or a variant). Thus, unlike in Dutch and Polish, in Italian the morphemes expressing the present perfect do not stand out with respect to the others and the Italian-speaking child has to navigate through the various verb inflections to find out which one encodes perfect meaning. It is this search that takes time and delays the form-meaning mapping.

As for the fact that *imperfetto* is more problematic than the perfect and is still not well understood at 5;0 years, Fiorin (2010) advances a proposal in terms of informativeness. In Chapter 8 (Section 4), we discuss the acquisition of the scalar implicature associated to quantifiers like *all* and *some*. There, we show that up to about age 5;0, Italian-speaking children accept sentences like *some monkeys are eating a banana* in a context, in which all monkeys were eating a banana. The rejection of the *some*-sentences requires children to generate scalar implicatures: the under-informative sentence is rejected because a more informative *all*-sentence would have been appropriate in the given context. Similarly, the perfect past and the *imperfetto* refer to past events, but in different ways (see Arosio 2010). Let us see how. If we know that a predicate is true of the maximal interval, we should use the perfect past. However, if we only know that it holds true of a subinterval, we would have to use the *imperfetto*. Suppose that John taught semantics between 2 and 4 p.m., yesterday (2–4 p.m. is the maximal interval). If we know that he did so all along the two hours, we should employ the present perfect: *yesterday, John has taught semantics between 2 and 4 p.m.* If we are not sure about whether he has taught semantics for the whole 2 hours, then

we can say: *yesterday, John was teaching semantics between 2 and 4 p.m.* Actually this latter sentence is true if John taught semantics between 2 and 3 p.m. and left for his office at 3 p.m. Thus, in a situation in which a predicate is true of the maximal interval, the present perfect is more informative than the *imperfetto* (and the perfect entails the imperfect). Similarly, to what happens with *some*-sentences, we should reject the *imperfetto* when a predicate is true of the maximal interval, because we generate a scalar implicature (*yesterday, John was teaching semantics between 2 and 4 p.m. and it is not the case that John taught the whole 2 hours*). This means that if the *imperfetto* is used when the predicate holds true of the maximal interval, it is under-informative, as it is a sentence with *some* uttered in a situation in which *all* relevant characters performed an action. Under this view, the failure to understand the *imperfetto* at age 5;0 can be explained in the same way as we explained the failure to reject *some*-sentences in a situation, in which all characters were involved in the event described by the sentence. In other words, it is the failure to generate a scalar implicature that underlies children's acceptance of the *imperfetto*, in a situation in which the predicate is true of the maximal interval. Hence children accept more in the case of the *imperfetto* than adults do.

## 1.13    Acquisition of verb inflections in children with SLI and Developmental Dyslexia

Italian-speaking children with SLI are not impaired with all verb inflections. Based on the longitudinal study of the spontaneous speech of one child with SLI in the period between 6;2 and 8;9, Cipriani, Chilosi, Bottari & Pfanner (1998) found that, among 655 finite verbs used, only 3.9% displayed an agreement error. This rate is similar to that of 2;6-year-old children with TD, as we showed earlier. In this study, it was also found that the SLI child used the three present persons singular quite productively and the third person plural less frequently; in addition, the child used the second person singular of the imperative. Cipriani et al. pointed out that, in contrast to the consistent use of bound verbal morphemes, this child was very weak in the use of articles and clitics (see Chapter 2 and 3 for a discussion of these topics).

A clearer picture emerges from experimental studies. Leonard, Bortolini, Caselli, McGregor and Sabbadini (1992) studied the performance of 15 children with SLI ranging in age from 4;9 to 5;11 and found that these children produced the third person singular morpheme 93% of the time, that is, as many as their age matched peers. Their accuracy in comprehending sentences including this morpheme was 84%. Although they scored lower than their age matched controls, their performance was not statistically different from that of the control children. By contrast, these children were poor in the production and comprehension of the third person plural inflection. In the production of this marker, accuracy was 50% and in the comprehension 65%. They were

worse than age matched controls (who scored 91% correct both in production and comprehension) and MLU-matched controls (children aged between 2;1 and 4;3 who scored 82% correct in production and 79% in comprehension) (see also Bortolini & Leonard 1996; Leonard & Bortolini 1998). Thus, taking together the Cipriani et al.'s (1998) and the Leonard et al.' (1992) study, it is apparent that singular verb inflections are not problematic for children with SLI, but the third plural inflection is. Leonard et al. (1992) pointed out that many errors in the use of the third person plural consist in the substitution of this morpheme with the third person singular. As we said earlier, this error is observed with younger TD children. However, Leonard et al. (1992) also pointed out that in most of the cases, the substitution involved trisyllabic verbs that departed from the dominant penultimate stress pattern and had two weak syllables following the initial stressed syllable, e.g. *dòr-mo-no* 'sleep-3pl', whose stress pattern is SWW. They pointed out that children with SLI performed much better on bisyllabic verbs, like *fàn-no* 'do-3pl' and *dàn-no* 'give-3pl', whose stress pattern is SW. Percentages of correct use with bisyllabic verbs was 80.5% versus 45% with longer verbs (see also Leonard & Bortolini 1998). This asymmetry was not evident in the two control groups. Bortolini, Caselli and Leonard (1997) confirmed the same asymmetry in the use of third person plural with a similar group of children affected by SLI. In addition, they reported that for these children first singular and plural persons were less problematic. More accurately, children with SLI did not differ from language and age matched control children in the production of first person singular, but differed from age matched controls in the production of third person plural. Bortolini et al. (1997) pointed out that verbs inflected with the first person plural marker conformed to the dominant penultimate stress pattern, e.g. *dor-mìa-mo* 'sleep-1pl' has a WSW stress pattern. On the basis of this array of results, Bortolini et al. (1997, 1998) proposed that the difficulty with third person plural markers is partly due to prosodic reasons, specifically to the omission of weak syllables not fitting the trochaic template (SW).[5] We illustrate this proposal based on Gerken (1996), since this is the most explicit prosodic proposal in the literature (see Chapter 2, Section 5).

The idea is that children apply to their intended utterance a prosodic template, which corresponds to a trochee, i.e. a sequence of a strong and weak syllable. If the intended utterance includes a syllable that does not fit the template, it is omitted. With this proposal, Bortolini et al. (1997) attempted to capture three types of errors found in the speech of children with SLI: omission of clitics (see Chapter 3), failure to produce

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5.    The prosodic account in the various articles written by Bortolini and collaborators changes in various details. For example, in Bortolini et al. (1992) the difficulty is located in the production of non-final weak syllables, but clearly this hypothesis cannot cover third person plural inflection, which is final. Here, we have chosen one formulation present in some of Bortolini et al.'s papers that seems more appropriate to cover the range of the data discussed.

some third person plural inflections, and omission of the initial syllables from trisyllabic non-words. In (43), we report instances of these three types with their prosodic structure. The idea is that children apply to the first utterance in (43a) the prosodic trochaic template (SW) and drop the first syllable (W), as this does not align with the first syllable of to the trochaic template (SW). By dropping the first Weak syllable, they omit the clitic. By the same reasoning, children drop the first syllable of the word *farfalle* and produce *falla* (43c).

(43)  a.  lo ve-do ((I) it see, I see it)
          W S W

      b.  Dor-mo-no ((they sleep)
          S W W

      c.  far-fal-la (butterfly)
          W S W

As Bortolini et al. (1997) recognized, their prosodic proposal is not satisfactory and needs some elaboration. Given a target like *dormono* 'they sleep' in (43b), the prediction would be that children with SLI produce *dormo* (SW) by dropping the final syllable, which does not fit the trochaic template. Children with SLI produce *dorme* 'sleep-3sg', that is, they do not simply drop the final weak syllable, but produce a third singular verb. Another problem comes from the first person plural, *dor-mìa-mo* 'we sleep-1-pl', whose prosodic structure is WSW. This form is less problematic than the third person plural. The prosodic account predicts that the initial weak syllable should be dropped leading children to produce *mìa-mo*, but this has not been reported to occur. Notice that in term of stress pattern *dormìamo* is equal to the stress pattern of a proclitic followed by a bisyllabic verb, displayed in (43a). Yet, we know that clitics are a major problem for children with SLI, as we said earlier (see also Chapter 3), but the first person plural is not. To make the prosodic proposal work, one has to claim that the problem in the use of verb inflections for SLI does not concern weak syllables *per se*, but has to do with the stress pattern in certain prosodic structures. Children with SLI have problem with the non-dominant stress pattern (SWW), but not with the dominant one (WSW or SW) at the level of words. When we move to the level of phrases, as in the case of clitics, things are more complex and other non-prosodic factors also become relevant (see Chapter 3).

Thus, Italian-speaking children with SLI do not have problems with all verb inflections, but only with third person plural (the first person singular is adequate given their language age).

A similar problem with third person plural is also observed in adults with Developmental Dyslexia (DD) and no previous diagnosis of SLI. Subjects with DD have a deficit in acquiring reading abilities, but often manifest problems in oral comprehension and production, in spite of the fact that they do not have a diagnosis of SLI.

Cantiani, Lorusso, Perego, Molteni and Guasti (2013) investigated the brain responses of adults with DD to agreement violations using the ERP (Event related potential methodology). Participants heard sentences like in (44) in which agreement between the subject and the verb was accurate (44a, c) or was inaccurate (44b, d). While listening, their brain activity was recorded. After they heard the sentence, they had to judge whether it was correct or not.

(44)   a.   I bambini giocano alla palla.         (The children play-3pl ball)
       b.   *I bambini gioca alla palla.          (The children play-3sg ball)
       c.   Il bambino gioca alla palla.          (The child play-3sg ball)
       d.   *Il bambino giocano alla palla.       (The child play-3pl ball)

Results showed that participants with DD were slightly less accurate than age matched control subjects in judging inaccurate responses (i.e. 40b, d; scores: 99.5% versus 98.9%). Brain responses, instead, were quite different. Control participants displayed the typical P600 response, i.e. a positivity around 600 ms from onset, in case of syntactic or morphosyntactic violations. Participants with DD, instead, displayed a N400 response, i.e. a negativity around 400 ms from onset. This response is typically found in cases of unexpected material or of semantic violations. Although on standardized oral comprehension texts participants with DD did not differ from controls, their processing of agreement violations seems to proceed differently than in control subjects. Processing plural verbs was particularly taxing for subjects with DD. Cantiani et al. suggested that participants with DD have difficulty in building implicit rules for handling inflectional morphology and rely on memorized chunks or on lexical semantic predictability. These findings, combined with those reported for SLI, indicate that some aspects of the processing of some inflectional morpheme is taxing for individuals with language problems.

Bortolini, Leonard and Caselli (1998) compared the performance in the use of verb inflections of Italian- and English-speaking children with SLI, whose mean age was 5;4 and 4;9, respectively. The relevant inflections considered for Italian were the first singular and plural and the third plural person, while for English was the third singular person. The authors found that Italian-speaking children with SLI used verb inflection correctly much more frequently than their English peers (75% versus 16%). This discrepancy is very large. It seems that a richer system is beneficial for SLI, as it is for children with TD.

The problems for Italian-speaking children with SLI are not confined to the third person plural. Bottari, Cipriani, Chilosi and Pfanner (2001), who examined the speech of 15 children with SLI (ranging in age from 4;2 to 10;7), found a greater and longer omission of the auxiliaries than of the copula (50% versus about 10%). Bortolini, Caselli and Leonard (1997) did not find any difference in the production and comprehension of the copula between SLI children and language-matched or age-matched

children (12 children aged 5;2 were examined). As we said earlier, the discrepancy between the auxiliary and the copula is also attested in children with TD and may suggest that children with SLI stay for a longer period than children with TD in a stage, in which computational resources are scarce and are obliged to truncate structures for a longer time. Notice that since the copula and the auxiliary BE are phonologically the same object, they cannot be omitted for phonological reasons.[6] The high omission rate of the auxiliaries is also confirmed in Leonard and Bortolini (1998), based on the spontaneous speech of 25 children ranging in age between 4;0 and 7;0. These children used auxiliaries less frequently than age-matched and language matched control children (aged 2;6 to 4;0). The comparison between Italian- and English-speaking children with SLI revealed that the former use the copula more frequently than the latter (62% vs. 37%). Again, English-speaking children have more trouble than their Italian peers in the verbal domain.

Finally, Cipriani et al. (1998) pointed out that the child with SLI they studied used RIs to some extent (but they did not report any figures). Bortolini, Caselli and Leonard (1997) reported that, when probed to produce third person plural inflections, children with SLI produced third singular inflections most of the time, but sometimes also produced infinitive verbs: 23% of the errors were infinitives. Cipriani et al. (1998) argued that the use of infinitives in Italian SLI could not be assimilated to the use of RIs in other early languages. On the one hand, children with SLI use consistently finite inflections. On the other hand, they seem to use them when the relevant inflections are problematic. Thus, one can conjecture that bare infinitives in Italian are either infinitive verbs missing the governing verb or finite verbs missing inflectional morphemes. Further research may attempt to prove or disprove this.

Earlier we reported that the acquisition of some tenses is problematic for typically developing children. In particular, an asymmetry between *passato prossimo* and *imperfetto* is also evident in language impaired populations, specifically in children with DD. Fiorin (2010) examined the comprehension of the *imperfetto* and *passato prossimo* in 20 subjects with DD, whose age was 9;3, and age-matched controls. In his experiment, the theater method used by Van Hout was adopted. It was found that dyslexic participants did not differ from controls in the comprehension of the *passato prossimo* (correct answers being 88% for children with DD and 92% for controls), but were worse than control in the comprehension of the *imperfetto* (70% vs. 88%). Moreover, there was variability in the dyslexic group (SD = 30), with 9 children (45%) performing at ceiling in the comprehension of the *imperfetto* and the others (55%)

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**6.** The verb BE and HAVE are not always monosyllabic in Italian (e.g. *sono*, I am is prosodically SW), BE is accented in third person singular of the present tense. Thus, the omission of these elements may not be amenable to an account in terms of omission of prosodic weak syllables.

displaying variability. This variability is often observed in the group of dyslexic children, as we will point out also in Chapter 3, Section 4.3. However, as there were only 3 items for the *imperfetto* in the battery, we cannot define chance performance. Future work is needed to corroborate these findings with a higher number of items.

We also notice that there was variability in the comprehension of the *passato prossimo*. Although 15 children (75%) with DD were at ceiling, the other 5 children were poor. We do not know whether these children were also weak in the comprehension of the *imperfetto*, a fact that future research needs to investigate. In particular, it would be important to establish whether the problems with the *imperfetto* are specific to this tense or are more general and affect the whole temporal system. If it is the *imperfetto* that is taxing for children with DD, we could claim that the generation of scalar implicatures in these children is somehow delayed (see Chapter 8, section 5).

A final thought that these findings about children with DD raise concerns the relation between DD and SLI. Under the view that DD is a reading problem, oral language difficulties are not expected. However, the overlap between dyslexia and SLI is often reported in the clinical practice and in the literature (Cantiani, Guasti, Perego & Lorusso 2012; McArthur et al. 2000; Catts et al. 2005; Bishop & Snowling 2004). The data discussed in this section add further evidence to this overlap. They suggest taking into account seriously the idea that reading is grounded on oral language and as such is a language skill and DD is a language problem (Vellutino 1979; see also Barshalom, Crain & Shankweiler 1993).

In summary, children with SLI have difficulties with the production and comprehension of third person plural inflection with verbs of the three conjugations and replace it with the third person singular inflection. Failure to produce the third plural inflection has been claimed to be a clinical marker of SLI in Italian at age 5;0 in that it identifies children with SLI with a high degree of accuracy. The same claim has been made for clitics (see Chapter 3). Processing difficulties with third plural inflections have also been reported for adults with DD. Children with SLI omit auxiliaries and in the case of BE they omit more often the auxiliary BE than the copula. Compared to what happens in English-speaking children with SLI, verb inflections are not entirely problematic for Italian-speaking children with SLI, and bare infinitive verbs are attested, but are not abundant; thus, the use of bare infinitives is different from the use found in other early languages. Finally, children with DD have difficulties with the *imperfetto*.

## Summary and questions for future research

This chapter has focused on the acquisition of verb inflections. We have seen that children start to use the present and the imperative, then the *passato prossimo* and next the *imperfetto*. For other tenses, less is known. The first three singular person inflections

of the present tense are already used with great accuracy between 2;0–2;6, and subject-verb agreement is acquired with both singular and plural subjects by age 3;0–3;6. Children distinguish finite verbs from infinitive verbs, and unlike in other early languages, RIs are not attested in Italian. However, there is an analogue of RIs, namely imperative verbs. In spite of great accuracy, with bound inflectional morphemes, children omit copula and auxiliaries in a "rule-based" way. Copula omission occurs in main declarative clauses, but neither in *wh*-questions nor in negative sentences. Omission of auxiliary BE does not pattern with omission of copula BE, in spite of phonological identity.

The *imperfetto* is acquired later than the present and *passato prossimo*, and the meaning of the *imperfetto* is still not yet acquired at age 5. This seems to be related to the fact that the understanding of the *imperfetto* requires the generation of a scalar implicature, which is still problematic for 5-year-olds.

Most of the studies on the acquisition of verb inflections focus on production. Some studies devoted to the language of children with SLI involve comprehension, as well. For children with SLI, only the third person plural verb inflection causes problems. Singular forms do not, nor does first person plural and this holds for production and comprehension. Third person plural inflection also causes problems to adults with DD, who process this form differently from control subjects. Children with DD demonstrate problems also with the comprehension of the *imperfetto*. All these findings call for more attention to language problems in children with DD.

In our presentation and discussion of the findings, we have mentioned some open questions for further inquiry. Imperative verbs have been claimed to be the Italian analogues of RIs. It would be interesting to establish whether there are agreement errors in the use of imperative verbs. These would be expected, as imperative verbs are the Italian analogue of RIs in other early languages. Thus, they should be used with all persons of the verbal paradigm (not just second person, for which imperative have a morpheme). The relevant question is which persons are involved in the uses of imperative verbs, an issue that would require a comparable investigation of RIs in another early language or in bilingual children. RIs are associated to a range of modal meanings, of which the imperative expresses only one, obligation. Is this the only meaning of imperative verbs as analogues of RIs?

Omission of BE in ambiguous contexts (adjectival or verbal past participles) patterns with omission of BE in verbal contexts and thus ambiguous past participles are to be regarded as verbal past participles. This finding has consequences for our understanding of the acquisition of passives, because these ambiguous past participles seem to instantiate verbal passives. In turn, this may suggest that some verbal passives are present earlier than generally assumed. This conclusion calls for some thoughts about what passive means in child language and more in general.

Auxiliary omission has been shown to be different depending on the language. This fact is reminiscent of article omission, which also differs cross-linguistically (see

Chapter 2). The data we discussed present some limits, but if the cross-linguistic difference is confirmed, it would be very interesting.

Auxiliary omission seems to be subject to some interpretative constraint: only with telic predicates are auxiliaries omitted. This finding is based on a single child. A more extensive investigation would be in order.

Understanding the *imperfetto* draws on the ability to generate scalar implicatures. If this hypothesis is correct, we should find an association between judgments on sentences with under-informative 'some' (Chapter 8) and with under-informative *imperfetto* clauses in the same group of children, and we should also find a similar developmental pattern in the comprehension of these structures.

# The acquisition of articles and aspects of nominal inflection

## 2.1 Introduction

Italian articles are freestanding morphemes marked for gender (masculine and feminine) and number (singular and plural) forming a full paradigm, as illustrated in Table 2.1. Articles can be definite, indefinite and partitive. Some articles have an allophonic variant that is used in front of some sounds. In addition, singular articles undergo elision in front of vowels.

**Table 2.1.** Paradigm of Italian articles

| Definite | | | | Indefinite | | | | Partitive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Masculine | | Feminine | | Masculine | | Feminine | | Masculine | | Feminine | |
| SG | PL | SG | PL | SG | PL | SG | PL | SG | PL | SG | PL |
| il, lo, l' | i, gli | la, l' | le | un | dei, degli | una, un' | delle | del, dello | dei, degli | della | delle |

In general, all common nouns are introduced by an article or another determiner. In some varieties of Italian, articles may also introduce proper names (e.g. *La Maria*, the Mary). From the semantic point of view, articles are definite or indefinite. The DP headed by the indefinite article can have a specific reading, when the referent is a specific individual or thing, or has a non-specific reading. In contrast to English, in generic contexts articles must be used, either the plural definite or the singular indefinite, as shown in (1a, b). The only exception are plural and mass nouns in the direct object position, as in (1c).

(1)   a.   I cani abbaiano
              Dogs bark

         b.   Un cane solitamente abbaia
              A dog usually barks

         c.   I castori costruiscono dighe
              Beavers build dams

Plural and mass nouns can also be bare when their reading is non-specific (in non-generic contexts) provided they occur as sisters of a lexical head, as the verb in (2), or

as a preposition, in (3) (Longobardi 1994). In these circumstances, a partitive article (or a plural indefinite article) is not necessary, but can be used.

(2)  a.  Voglio (del) latte
         '(I) want (some) milk.'

     b.  Comprerò (dei) pasticcini
         '(I) will buy (some) candies.'

     c.  Cadrà (della) neve
         will fall (some) snow
         'Some snow will fall.'

     d.  cadranno (delle ) stelle
         will fall (some) stars
         'Some stars will fall.'

(3)  a.  con (del) latte
         with (some) milk

     b.  con (dei) pasticcini
         with (some) candies

From the prosodic point of view, monosyllabic articles are proclitic to the following word and more precisely, they are unfooted syllables that form a clitic group or a prosodic word with the following word (the noun). Indefinite articles, being bisyllabic, form a trochaic foot on their own. Articles *lo*, *la*, and *le* are homophonous with the direct object clitic pronouns and the articles *gli* and *le* are homophonous to the indirect object clitic pronouns.

Articles agree in number and gender with the noun they stand with and with the adjective, if this is present. Nouns in Italian belong to one of three classes depending on their endings. The two grey boxes represent the most productive classes, which also attract loan words.

**Table 2.2.**  Nominal inflections of the three classes based on noun endings

| Class I Ending: Sg/pl | Class II Ending: Sg/pl | Class III Ending: Sg/pl |
|---|---|---|
| -o/-i il libr-o, i libr-i, 'the book', 'the books' | -a/-e la cas-a, le cas-e, 'the house', 'the houses' l'aioul-a, le aiuol-e 'the garden', 'the gardens' | 1. -e/-i il padr-e, i padr-i, 'the father', 'the fathers' |
| l'amic-o, gli amic-i, 'the friend', 'the friends' Ami[k]o, ami[tS]i, lo zain-o, gli zain-i, 'the schoolbag' 'the schoolbags' | | 2. -e/-i la madr-e, le madr-i, 'the mother', 'the mothers' |

Nouns ending in *-o* are generally masculine and are introduced by the article *il* in the singular; in the plural, they end in *-i* and are introduced by the article *i*. With some nouns introduced by the sounds *sp*, *st*, *z* or by vowels, the allophonic variant of the *il* article, i.e. *lo*, is used (elided in front of vowels) in the singular and *gli* in the plural. We have for example *lo zaino* (the schoolbag), *gli zaini* (the schoolbags). Feminine nouns, typically ending in *-a* in the singular and *-e* in the plural, are introduced by the article *la* and *le* (the singular article is elided in front of vowels), respectively. Finally, nouns ending in *-e* can be either masculine or feminine, and depending on their gender, they are introduced by masculine or feminine articles. For classes I and II nouns, the ending of the noun is transparent, i.e. we know which article to use. For class III, it is not. Finally, some nouns are irregular in that their ending does not transparently indicate which article to use (e.g. *il poet-a*, the poet, *i poet-i*, the poets) or have irregular plural (*il dit-o*, the finger, *le dit-a*, the fingers; *l'uovo*, the egg, *le uova*, the eggs).

Acquisition of articles is preceded by the use of monosyllabic placeholders, that is, unmarked vowels that sign the position of articles. This use persists when articles start to be employed, although a decrease is observed. Initially, article use is optional and gradually increases to become target-like, around age 3.

From a cross-linguistic point of view, although Italian-speaking children omit articles, it is rare to find a stage in which they do not use any monosyllabic placeholders or articles, contrary to Dutch, for instance. In addition, Italian-speaking children seem to reach the final stage more quickly. Interestingly, article omission is ruled by some constraints: article omission is higher in subject than in object position; article omission in prepositional contexts may persist for longer time. Articles are omitted not only by monolingual Italian-speaking children, but also by bilingual or early L2 children (and adults), although influences from or towards the other language are evident. Children with SLI also omit articles, but to a lesser extent than clitics, which are homophonous (see Chapter 3).

Different accounts have been proposed to explain the article omissions, ranging from prosodic to syntactic and semantic accounts. We will illustrate the pros and cons of these accounts and suggest that the full pattern of article development needs to be explained by invoking different sources of difficulties.

Nominal inflection has not been studied extensively and much less than verbal inflection. This may be because it is simpler and its acquisition does not present many challenges. Consequently, when one considers the DP structure, the focus gets immediately to the use of the articles. The nominal inflection is considered in its role of partner in the agreement process occurring between the article and the noun. However, whether the gender and number on nouns are correct and whether articles agree with nouns are two distinct questions. We will see that monolingual children acquire gender on nouns smoothly. Adult L2 learners have more trouble. Number comes after gender and is problematic neither for children with typical development nor for children with SLI.

The chapter is organized as follows. In Section 2, we offer an overview of article use in Italian L1; in Section 3, we put our data in a cross-linguistic perspective. In Section 4, we discuss an account that capitalizes on prosodic constraints on the use of articles. Next, we examine syntactic constraints on article use (Section 5) and in Section 6, we provide an account that takes into consideration both prosodic and syntactic constraints and suggests that these constraints operate in different periods of development. In Section 7, we present data on article omission in prepositional contexts. In Section 8, we discuss data on article use in bilingual and L2 learners and in Section 9, we turn to article use in children with SLI. Section 10 and 11 are dedicated to the acquisition of nominal inflection in typical and atypical population. We consider gender and number (Section 19) and conclude with a discussion of the acquisition of the diminutives (Section 11), an aspect of derivational morphology.

## 2.2   The L1 acquisition of articles

Initially, children may use nouns in isolation, but already at the stage in which the MLU ranges from 1.2 to 1.6 (Stage I in Brown 1973), monosyllabic placeholders (MPH) often introduce these nouns, according to Bottari, Cipriani and Chilosi (1993/4). MPHs are vowels realized in the low-central area of the phonetic space and are regarded as unmarked segments from the phonological point of view.

(4)   [e] bimbo (Rosa, 1;10)
      [e] little boy
      [a] lì (Rosa, 2;1)
      [a] there

While initially MPHs may have a range of functions, already at the end of Stage I, they can be regarded as placeholders of only closed-class words (articles, prepositions, clitics, copula). MPHs are typically found in front of nouns and initially they clearly stand for articles; then, they can be interpreted as placeholders of prepositions. During development, MPHs evolve into phonetic approximations to proper articles, as they retain the vocalic features of the corresponding articles (e.g. [a] for [la]) and then they decrease and give way to the corresponding articles. Although MPHs are used at the one word stage, bare nouns are also found, which are ungrammatical from the point of view of the target grammar.

(5)   a.   ancora  biscotto  (Camilla, 1;7)
           more     biscuit
           'some more biscuit'

Thus, the development of the article system is characterized by article omission, use of MPHs and use of articles. Although the first two phenomena temporally precedes the third, they can overlap in a single child with a developmental pattern characterized by

a decrease of omissions and MPHs and an increase of articles. Bottari et al. (1993/4) interpreted MPH as presyntactic devices that occupy the position later filled by corresponding closed-class words. From this point of view, children using MPHs in front of nouns already project a structure including the DP and the NP, as in (6), with D filled first by a placeholder and later by articles and taking NPs as complements.

(6)

$$
\begin{array}{c}
\text{DP} \\
\diagup\quad\diagdown \\
\text{D}^0 \qquad \text{NP}
\end{array}
$$
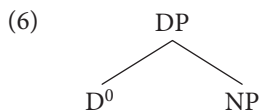
In contrast to other closed-class words, articles are used from very early on with some forms such as *la* (the-fem-sg) and *le* (the-fem-pl) being used already around 1;6 (Bottari et al. 1993/4; Pizzuto & Caselli 1992). The article *il* (the-masc-sg) is more difficult, possibly because it does not conform to the phonological pattern of Italian, but it may be used already at 1;9 (Cipriani, Chilosi, Bottari & Pfanner 1993). Although individual variations are observed, *il* and *la* (the-fem-sg) are acquired around 2;6, according to Pizzuto and Caselli (1992)[1] or even earlier (see also Pizzzuto and Caselli 1993), depending on the criteria assumed to define acquisition (see also Bottari et al. 1993/4; Caprin & Guasti 2009 for similar ages). Generally, singular forms become productive before plural ones. Finally, some studies report that definite determiners appears before indefinite ones (Bottari, Cipriani & Chilosi 1996), but in other studies they are reported to appear at the same time.

As we said earlier, along with use of articles or MPHs, omission is observed along the developmental period. All these observations hold true for the data gathered with the longitudinal method: 6 children from the Calambrone corpus (age range 1;11–3;2; Cipriani, et al. 1993), 3 children from the Roma corpus (age range: 1;4–3;0; Pizzuto & Caselli 1992) and one child from the Antelmi corpus (age range: 1;5–3;4; Antelmi 1997). They are also confirmed by data collected with the cross-sectional method by Caselli, Leonard, Volterra and Campagnoli (1993) and by Caprin and Guasti (2009). Caprin and Guasti examined the semi-spontaneous speech of 59 children aged from 1;10 to 2;11 with a mean age of 2;4. Their findings confirmed the results of the longitudinal studies cited above:

1. Singular forms are used before plural ones;
2. A clear development occurs in the use of articles across the three groups of children with an increasing level of linguistic competence as measured by the MLU;
3. Articles are used by all the children belonging to the linguistically less developed group.

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1.  Pizzuto and Caselli (1992) adopted a very stringent criterion of acquisition: 90% correct use in obligatory contexts for three consecutive samples. But a less stringent criterion, 75% correct use has also been adopted (as in Cipriani et al. 1993; see also Caprin & Guasti 2009).

For each group, Table 2.3 reports some information about the features of the group (the first three columns), the number of children who use singular and plural articles, the means of articles employed by each group (the authors included in the counts only data points in which at least 3 contexts of use were found).

**Table 2.3.** Means of articles used and number of typically developing Italian-speaking children who use singular and plural articles. Children were divided in three group based on their MLU. Semi-spontaneous data from Caprin and Guasti (2009)

| Mean age | N. of children | MLU | Singular forms | | Plural forms | |
|---|---|---|---|---|---|---|
| | | | N. of children | Mean | N. of children | Mean |
| 2;3 | 15 | 1.0–1.5 | 15 | .28 | 9 | .41 |
| 2;4 | 19 | 1.5–2.0 | 19 | .48 | 17 | .58 |
| 2;6 | 25 | 2.0–3.1 | 25 | .70 | 25 | .78 |

We may note that plural forms were more frequently used than singular ones, but fewer children employed them. The percentages of article use in Table 2.3 is slightly lower than those reported in Guasti and Gavarrò (2003) based on longitudinal data from 3 children (Calambrone corpus, CHILDES) with data classified on the basis of the MLU, as is evident in Table 2.4. This discrepancy is likely due to the higher number of children in Caprin and Guasti (2009) and thus to the larger variation.

**Table 2.4.** Percentage of article use in 3 Italian-speaking children as a function of their MLU. Data from Calambrone corpus, CHILDES, elaborated by Guasti and Gavarrò (2003) and collected with the spontaneous method

| MLU | Article use |
|---|---|
| MLU < 2 | 45% |
| MLU 2–3 | 87% |
| MLU > 3 | 93% |

It is evident that before age 3 children employ a fair amount of articles. This is also confirmed by the cross-sectional study carried out by Caselli et al. (1993) using an elicitation method. Table 2.5 presents the results of this investigation. For each form of the article the percentages of article use in obligatory contexts is reported for three age groups.

Although development occurs for each individual article, it is evident that already in the younger group some forms were frequently used. In all studies examined, commission errors were very rare: 3%, in Caprin and Guasti (2009), 3% to 4% in Pizzuto and Caselli (1992). The types of errors are also very similar across studies: choice of

**Table 2.5.** Percentage of use of each articles in three group of children. Data collected with an elicitation method by Caselli, Leonard, Volterra and Campagnoli (1993)

| Age | Il | La | Lo | I | Le | Gli |
|---|---|---|---|---|---|---|
| 2;6–3;0 (N = 12) | 76 | 87 | 78 | 75 | 81 | 47 |
| 3;6–4;0 (N = 10) | 97 | 99 | 87 | 96 | 99 | 88 |
| 4;6–5;0 (N = 10) | 99 | 100 | 97 | 100 | 97 | 86 |

the inappropriate allophonic variant (7a: *i* rather than *gli*), of the wrong article (7b/7c: gender error *la* rather than *il*). In (7b), the noun is suffixed with *-e*, an ending that can be associated to feminine or masculine nouns and thus its presence is not very informative about the gender of the noun. In (7c), the word *problem-a* (problem) is irregular, in that its ending *-a* is typically associated to feminine nouns, while *problema* is masculine. These two kinds of errors were rare. More common ones were cases of substitution of *lo* and *gli*: *lo* is often replaced by the more common *il* and *gli* by the more common *i* (Caselli et al. 1993).

(7) a. i occhiali (correct form: gli) (C. 1;9) (from Pizzuto & Caselli 1992)
the-masc-pl glasses

b. la sale (correct form: il) (from Caprin & Guasti 2009)
the-fem-sg salt-masc-sg

c. la pobema (correct form: il) (target: il problema) (Agnese from Chini 1993)
the-fem-sg problem-a

Thus, gender on articles (and nouns, see Section 16) is acquired very quickly (Chini 1993; Kupisch, Müller & Cantone 2002; De Marco 2005). This holds true for nouns with a predictable ending *-a/-o* (feminine and masculine) and also for nouns with an unpredictable ending *-e* (*can-e,* dog is masculine, while *tigr-e*, tiger is feminine), with very rare errors, like in (7b/c), as we just said. Very often nouns are suffixed with the diminutive suffix in the speech of caregivers (see Section 17, Kupisch et al. 2002). This process of suffixation has the effect that even nouns with an unpredictable ending as to their gender are turned into nouns with a predictable ending:

(8) maial-e 'pig'  maialett-o 'little pig'
can-e 'dog'  canin-o 'little dog'
tigr-e 'tiger'  tigrett-a 'little tiger'

This transparency of the gender system has been claimed to enhance gender acquisition and the acquisition of articles as well, as, in many cases, article endings harmonize with noun endings (one exception is *il*) (Serratrice 2000; Chini 1993).

Comprehension of number on articles was assessed in two studies (Caselli et al. 1993; Dispaldro & Benelli 2012). Caselli et al. presented pictures along with DPs, e.g.

*la radio – le radio* (the-fem-sg radio – the-fem-pl radio) or *il camion – i camion* (the-masc-sg truck – the-masc-pl truck). Invariant nouns were used so that only the number information on articles could be used to choose the correct picture. The results of this study are reported in Table 2.6. It is evident that even the youngest group of children was quite competent in using number information on the articles and that both singular and plural articles elicited very accurate responses. A comparison of comprehension (results in Table 2.6) and production (results in Table 2.5) reveals that the former is more advanced than the latter, although we urge some caution, because of the different material used. Nevertheless, production and comprehension of number on articles seem to be at least aligned and both do not present problems.

**Table 2.6.** Percentage of correct comprehension of articles by three groups of children. Data from Caselli, Leonard, Volterra and Campagnoli (1993)

| Age | Singular | Plural |
|---|---|---|
| 2;6–3;0 (N = 12) | 88 | 88 |
| 3;6–4;0 (N = 10) | 100 | 92 |
| 4;6–5;0 (N = 10) | 95 | 92 |

In summary, MPHs occurring in front of nouns and taking an article function appear at the age of 1;6. From that point, development is observed with MPHs evolving in phonetic approximation and giving way to articles. Some articles appear before others; singular articles are acquired before plural articles. MPHs, articles and omissions are observed during this developmental period with MPHs and omissions decreasing and articles increasing between 1;6 and 3;0. Looking at various cross-sectional or longitudinal studies, it seems fair to conclude that by age 3 or some months earlier or when MLU is 3, article omission is no longer evident.

## 2.3 Article use in Italian keeping an eye on the crosslinguistic dimension

In this section, we are going to examine article use in Italian in comparison to article use in two other early languages, i.e. Dutch and German. As a first step, we illustrate the properties of articles in these two languages. Dutch has definite and indefinite articles; the definite article is *de* and is used with masculine, feminine, singular and plural nouns. The form *het* is used with singular neuter nouns and again *de* with plural neuter nouns. The indefinite article *een* is used with singular, masculine, feminine and neuter nouns. There is no plural indefinite article. German has definite and indefinite articles declined differently depending on the number and gender of the accompanying noun. Articles can be masculine, feminine and neuter, singular and plural. There

are four declensions: nominative, accusative, dative and genitive. Table 2.7 is a summary of German articles.

**Table 2.7.** Paradigm of German articles

|  | Definite | | | | Indefinite | | | |
|---|---|---|---|---|---|---|---|---|
|  | Singular | | | Plural | Singular | | | Plural |
|  | Masculine | Neuter | Feminine | M/F/N | Masculine | Neuter | Feminine | M/F/N |
| Nominative | Der | Das | Die | Die | Ein | Ein | Eine | Eine |
| Accusative | Den | Das | Die | Die | Einen | Ein | Eine | Eine |
| Dative | Dem | Dem | Der | Den | Einem | Einem | Einer | Einen |
| Genitive | Des | Des | Der | Der | Eines | Eines | Einer | Einer |

To recall, there are very few Italian-speaking children (among those whose transcriptions are available through CHILDES, MacWhinney 2000) who start with a stage of complete article omission or lack of MPH (Antelmi 1997). Moreover, as shown in the Table 2.3 and Table 2.4, even the youngest children use articles between 28% and 45% of the cases. This is not so in other early languages, like Dutch or German, where at the outset of noun production articles may not be found and MPH are rare or even absent (Eisenbeiss 2000; Lleó & Demuth 1999; Penner & Weissenborn 1996; Peters 2001). In Italian, articles or MPH are used from very early (before age 2), but omissions are also observed, as we have already said. However, crosslinguistic differences in article use are evident. Guasti, Gavarrò, De Lange and Caprin (2008) pointed out that article omission was generally lower in Italian than in Dutch. It remained so for some time, with convergence to the target system occurring earlier in Italian than in Dutch (see also De Lange, Avrutin & Guasti 2006; Guasti & Gavarrò 2003). De Lange (2008), using similar criteria as those used in Guasti et al. (2008), also pointed out that article omission was lower in Italian than in German, but this difference was observed for a shorter time than the one between Italian and Dutch. Table 2.8 illustrates these differences. The two stages of development are identified based on the rate of verbal utterances used by the children. The data used for this Table included about 2000 utterances from each language. At Stage 1, the three languages differed, while at stage 2, only Dutch differed from the other languages.

The development of article use in Italian is similar to that in Catalan (Guasti & Gavarrò 2003; Guasti et al. 2008). Thus, a stage with a complete absence of articles is hardly found in Italian, and articles are used earlier and more frequently by Italian-speaking children, as compared with children speaking Dutch and German. This happens in spite of the fact that the presence of bare nouns in the caregivers' speech is more or less the same, i.e. caregivers in Italian, Dutch and Catalan use about 20% bare

**Table 2.8.** Means of article omission in two stages defined on the basis of the rate of verbal utterances in children speaking Italian (4 children), German (4 children) or Dutch (4 children). Spontaneous data present in CHILDES and elaborated by De Lange (2008)

|  | Stage 1<br>0.03–0.29 VU | Stage 2<br>0.3–0.6 VU |
|---|---|---|
|  | **Means of article omissione** | |
| Italian | 0.58 | 0.16 |
| German | 0.72 | 0.19 |
| Dutch | 0.87 | 0.41 |

(grammatical or not) nouns in their interaction with children (Guasti et al. 2008). In Section 6, we will offer an explanation for this cross-linguistic difference in terms of the different prosodic and syntactic properties of the target system for articles.

## 2.4   Article omission and phonological constraints

Article omission does not occur randomly. Crisma and Tomasutti (2000) pointed out that article omission was influenced by the phonological context. They found that in the speech of two Italian speaking-children, masculine articles, *il* and *i*, are omitted more frequently than feminine ones, *la* and *le*, in non-initial positions (67% vs 41%); in contrast, in isolation they were omitted at the same rate (71% vs. 68%). They explained these discrepancies by noting that, in rapid speech, the article *il* is often reduced to *l* and syllabified with the preceding word, thus, becoming the coda of the last syllable of the preceding word. As children tended to delete coda consonants, masculine nouns tended to surface without any article. These processes (reduction, resyllabification and CODA deletion), which give rise to article omission in non-initial positions, are illustrated in (9).

(9)   levo il tappo → levo'l tappo (reduction + resyllabification) → levo tappo
      (CODA deletion) (Rosa14)
      (I) take off the cork

Feminine articles were not reduced and *a fortiori* the process of CODA deletion did not apply. Therefore, these articles were produced more frequently than masculine ones in non-initial positions. Reduction of the article *il* cannot occur in sentence initial position or with nouns in isolation, because there is no preceding word. Therefore, in these contexts, feminine and masculine articles were omitted at the same rate. Moreover, this clear-cut pattern is not observed in all children. One child investigated by Crisma and Tomasutti (2000) omitted masculine articles more than feminine ones

regardless of their position. In addition, while the process of CODA deletion may explain the omission of the article *il*, it is not clear what explains the omission of the masculine plural article *i*. The plural article is pronounced as a glide, resyllabified with the preceding word as shown in (10).

(10)  Ho  visto i   cani.
      ho  [vistoj]  cani
      (I) have seen-the dogs

Crisma and Tomasutti (2000) also pointed out that article omission was influenced by the stress pattern of the accompanying word. Articles were more often omitted in front of nouns stressed on the second or successive syllable [stress pattern (w)wSw(w) (with w = weak and S = strong or stressed syllable; e.g. bam 'bi na] than on nouns stressed on the first syllable (Sw). This observation was further investigated in Giusti and Gozzi (2006), who following Lleó and Demuth (1999), claimed that the use of articles is constrained by the prosodic structure that children can produce in a given stage of development, as manifested by the type of words produced in that stage. On this view, the availability of a prosodic model at the word level bootstraps the production of articles. This means that children can produce an article in front of a bisyllabic word (Sw) resulting in a prosodic structure (wSw), with the first weak syllable being the article, when they are able to produce trisyllabic words with the stress pattern wSw (which is the most common pattern in Italian). On the basis of the speech of one child, Gaia (age range: 1;7–2;4), Giusti and Gozzi (2006) noticed a parallel development between the prosodic structure of words and the prosodic structure created by an article and a word. More specifically, at Stage I, only bisyllabic trochaic words (Sw) were produced and articles were absent. In Stage II, trisyllabic bare nouns (wSw) were produced and articles with bisyllabic trochaic words started to be used. At this stage, the article was attached to the prosodic word as an unfooted syllable yielding a prosodic structure identical to that of trisyllabic words (wSw). Although no change occurred at the word level, in a transitional stage (stage III), articles gained the possibility of being prosodified at the level of the phonological phrase. They were still treated as unfooted syllables, and could appear with trisyllabic words (w[wSw]). In Stage IV, words with four or more syllables were used and articles were inserted regardless of the stress structure of words. This means that at this stage, prosodic words with more than one foot were possible and this would explain why the indefinite articles *uno* and *una*, which are not clitics, but form a prosodic foot on their own, were also employed with nouns. This developmental pattern proposed by Giusti and Gozzi is summarized in Table 2.9.

    We can notice an asymmetry in the transitional stage; as we said earlier, although there has not been a change at the level of words, an additional possibility for prosodifying articles emerged. Giusti and Gozzi (2006) justified this possibility as a last resort

**Table 2.9.** Development of the prosodic structure of words and of the prosodic structure of articles plus words in a child (Gaia) based on Giusti and Gozzi (2006) [σ is the syllable and can be S(trong) or w(eak), PW is the prosodic word, F is the foot and φ is the phonological phrase]

| Stage I 1;7–1;10 | | Stage II 1;10–1;11 | | Transitional stage (stage III) 1:11–2;2 | |
|---|---|---|---|---|---|
| PW | Article | PW | Article | PW | Article |
| $[_{PW}σ_S\ σ_W]$ | No article | $[_{PW}\ σ_W\ [Fσ_S\ σ_W]]$ | $[_{PW}Art+$ $[_Fσ_S\ σ_W]$ | As in stage2 | $[_φ$ Article + $[_{PW}\ σ_W$ $[_F\ σ_S\ σ_W]]$ |
| Tàta [for acqua], water | | Soddìno Soldìno Little coin | e nòci le noci the nuts | As in stage2 | e signòe le signore |

strategy for articles to express gender and number features on nouns that are not inflected or have an unpredictable ending. Under this view, morphosyntax (necessity of expressing gender and number features) bootstraps the prosodic structure (see also Giusti 2010 for further development of this approach).[2]

Although appeal to prosodic constraints may be appropriate to account for article omission in the first stage, it does not suffice to explain the whole pattern observed in the previous sections (see also Guasti & Gavarrò 2003). First, in other aforementioned studies children still omitted articles after 2;2 years, the age at which Gaia started to use words with more than three syllables and articles without restrictions; it is only around age 3 that we observe target-like performance. Granting individual differences in article use, it seems hard to claim that all the children in previous studies did not yet reach Giusti and Gozzi's (2006) stage III in their production of words before 3 years. This means that there is a period of about 10 months (from 2;2 to 3;0), in which children still omit articles, but master the prosodic structure necessary to produce them. Second, Caprin and Ioghà (2006) tested one version of the prosodic hypothesis, through a repetition experiment, and found no effect of the stress pattern of words on the article omission. Specifically, they tested 42 children (age range 2;0–3;6) divided in three age groups and examined the repetition of *la* and *una* in front of bisyllabic trochaic words and of trisyllabic ones (with stress on the penultimate syllable). *La* is a clitic that is attached

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2. Nina Hyams suggested that prosodic constraints may be responsible for the higher frequency of use of MPHs in Italian (Spanish, Catalan) than in other languages (English, Dutch, German). Since in Italian, content words are minimally bisyllabic with the stress pattern Sw, this would mean that children who use MPHs in front of a bisyllabic word master a prosodic structure including three syllables with the prosodic pattern wSw. These children would be in Giusti and Gozzi's stage II. However, MPHs are likely used already in stage I, before articles.

to bisyllabic words as an unfooted syllable and form with them a prosodic word (Stage II in Table 2.9). When it precedes a trisyllabic word, the result is a prosodic structure with two unfooted syllables (wwSw) and is attached to the phonological phrase (transitional stage in Table 2.9). In contrast, *una* is a foot attached to another foot (disyllabic word) or to a prosodic word with an unfooted syllable (trisyllabic word). According to the prosodic hypothesis formulated by Giusti and Gozzi (2006), one would expect more omissions of *la* in front of trisyllabic than in front of bisyllabic words, at least in the first group. Omission of *una* would not be expected to pattern with omission of *la*, but should be higher than omission of *la* at least in the first group. Neither of these predictions was fulfilled. Caprin and Ioghà only found an effect of age, with older children being more accurate. Both articles *la* and *una* were omitted at the same rate and irrespective of the stress pattern of the following word. Crucially, this held true for all three groups of children, as can be seen in Table 2.10. The fact that omission of articles is not sensitive to the prosodic context in which they occur suggests that at the age investigated article omission does not depend on their immature prosodic sensitivity.

**Table 2.10.**  Percentage of article omission (*la* and *una*, the-fem-sg, a-fem-sg) as a function of the following noun (bi- or trisyllabic) across three age groups of typically Italian-speaking children. Data collected with the repetition method by Caprin and Ioghà (2006)

|                     | *la*-bisyllabic N | *la*-trisyllabic | *una*-bisyllabic | *una*-trisyllabic |
|---------------------|-------------------|------------------|------------------|-------------------|
| G1 2;0–2;6 (N = 14) | 39                | 45               | 37               | 45                |
| G2 2;6–3;0 (N = 14) | 12                | 22               | 11               | 16                |
| G3 3;0–3;6 (N = 14) | 11                | 11               | 3                | 4                 |

One could claim that these children were all in Giusti and Gozzi's (2006) stage IV, when prosodic constraints do not apply any longer. But, this amounts to accept the idea that we have to explain optional article omission without appealing to prosodic constraints, because children are in a stage, in which they can use the prosodic structure needed to accommodate articles.

In summary, it has been claimed that article omission is influenced in various ways by the phonological context in which articles are found and is constrained by the prosodic structure that a child can produce at a given stage of development. Although we cannot disregard phonological factors, as they may bootstrap the use of articles in the first stage of development, they are hardly the single cause responsible for article omission. In particular, we have examined various pieces of data showing that article omission is still ongoing, when complex prosodic structures at the word levels are mastered by children; omission persists, regardless of the phonological status of articles or of the stress pattern of the following word. In the next section, we examine another context of omission hardly amenable to a prosodic explanation.

## 2.5   Article omission and the syntactic context: The subject-object asymmetry in Italian

Another fact that militates against a prosodic explanation as the sole source of article omission is the observation that, in sentences, articles are omitted more frequently from the subject than from the object position. Caprin and Ioghà (2006) based on the repetition of short sentences including transitive verbs and the article *la* by 37 children (age range 2;3–3;2) found that the omission rate of *la* was higher in the subject than in the object position; in addition, no difference was found depending on the age of the children. Comparing the results of *la* omission in isolation and in subject position, they did not find any difference, while a difference was found between omission of *la* in isolation and in object position, with the latter context eliciting less omission than the former. The same result was found by Caprin and Guasti (2009) based on the spontaneous speech of 59 children (age range 2;3–2;6) and by Mezzenzana (2009) based on the spontaneous production of 7 children (age range 1;10–2;5). This author found that in the subject position, children either omitted articles or used MPHs more often than in the object position. In other words, the subject position is more prone to omission or simplification of articles than the object position.

Although we described this subject/object asymmetry in syntactic terms, it can be argued that its nature is prosodic. Indeed, Gerken (1996) has advanced this proposal based on English and Crisma and Tomasutti (2000) have extended it to Italian. According to Gerken's approach, when a child produces a sentence, s/he applies a trochaic template to the intended utterance and omit those weak syllables that do not fit the trochaic template. Thus, given an Italian utterance like in (11a), whose metrical structure is in (11b), the application of the trochaic template in (11c) would result in the sentence in (11d).

(11)   a.   La zebra fa la nanna          clause
       b.   w  S w   S w   S w           metrical structure
       c.       [S w]  [S w]  [S w]      trochaic template
       d.   zebra fa la nanna            output

In (11d) the article accompanying the noun in the subject position is omitted since it is a weak syllable that does not fit the trochaic template. By contrast, the article in the object position is produced given that it forms a trochaic foot with the monosyllabic verb preceding it. Crisma and Tomasutti (2000), through an elicited production experiment, attempted to provide evidence for this proposal, but in a different way than in Gerken (1996). They did not directly test omission in the subject and object positions, but only in the object position by manipulating the prosodic structure of the preceding verb. They elicited target sentences with the structure Verb-Object and with 3rd person singular null subject. Two types of sentences were elicited. One type included

a monosyllabic verb (*fa* la torta, (he) makes the cake). A second type included a bisyllabic verb with stress on the first syllable (*pren*de la pizza, (he) takes the pizza). Their results showed that children were more likely to omit an article in the object position when the preceding verb was bisyllabic (83% articles were omitted in this case) than when the verb was monosyllabic (only 8% omission was observed). They claimed that this discrepancy depended on the prosodic possibilities of articles. When the verb preceding the article was monosyllabic, as in (12a), the article was prosodified with it to form a trochaic foot. As the article was part of the trochaic template, it was not omitted. In contrast, when the verb preceding the article was bisyllabic, as in (12b), the article could not be prosodified with it. Therefore, it was not included in the trochaic template and was more prone to omission.

(12)    a.    fa la torta
              S w S w

        b.    prende la torta
              S w w S w

Various concerns can be leveled at this explanation. Monosyllabic verbs are rare in Italian, unlike in English, being limited to a handful of verbs (*fare,* to do, *dare,* to give, *dire*, to say) only when these verbs are used with certain tenses (e.g. present tense, imperative). This means that, most of the time, Italian-speaking children use verbs that are not monosyllabic. In turn, we should expect a huge amount of article omission in Italian (around 83% article omission is found in Crisma & Tomasutti 2000), at least in the initial stages. However, this is not what we saw earlier (omission ranges between 72% and 55% in Tables 2.3 and 2.4). Second, articles are never enclitic to the preceding verb in Italian. At most one could argue that in (12a) there is restructuring between the phonological phrase including the verb and the one including Art+N in a single phonological phrase and this is not possible in (12b) (thanks to Cinzia Avesani for this suggestion). Finally, Caprin and Ioghà (2006) explicitly tested the prosodic influence on article omission by including in their experiment mentioned earlier both mono- and bisyllabic verbs and by explicitly testing omission in the subject and object position. Based on the prosodic approach, one would expect higher article omission in the object position when the verb is bisyllabic than when it is monosyllabic. Moreover, a subject/object asymmetry should be evident when the verb is monosyllabic, as the article in front of the direct object should prosodify with the preceding verb and form a trochaic foot with it. By contrast, with bisyllabic verbs, one should not expect a subject/object asymmetry, because the article in the object position could not prosodify with the preceding verb. Caprin and Ioghà (2006) did not confirm these predictions. They found that omission of the article *la* was higher in the subject than in the object position regardless of the prosodic structure of the verb preceding the direct object. Moreover, Caprin and Guasti (2009) did not find an effect of the prosodic structure of

the preceding verb in the spontaneous speech of 59 children. Thus, we can conclude that articles are more difficult to produce in the subject than in the object position. Although prosodic processes of the type evoked by Crisma and Tomasutti can contribute to article omission in some cases, a satisfactory explanation must also refer to structural or syntactic factors.

The subject/object asymmetry is observed not only in child language, but also in the agrammatic speech and in headlines, as shown by Guasti, Foppolo, Luzzati and Caprin (2004). These authors found a clear-cut asymmetry in the speech of 7 agrammatic patients, with article omission in the subject position ranging from 15% to 73% and in non-initial positions (the direct object position or the object of a preposition) ranging from 2% to 37% with the asymmetry being evident in each patient. Similarly, based on 1000 headlines taken from newspapers, these authors established that article omission was higher in initial positions (91%) than in non-initial positions. Some examples are reported in (13). Initial positions include the subject position, as in (13a), and the very first position of the utterance, as in (13b).

(13)  a.  Manager vince all'asta un Picasso
           manager wins at the auction a Picasso

       b.  Pensioni, riforma rinviata al 18 aprile
           pensions, reform postponed until April 18

Moreover, Stowell (1999), based on English headlines, has shown that it is possible to omit an article in object position if the article is also omitted in the subject position. The same constraint holds for Italian. Thus, (14a) is possible (as it is (14b)), but not (14c).

(14)  a.  Portinaio trova un pinguino
           Porter finds a penguin

       b.  Portinaio trova pinguino
           Porter finds penguin

       c.  *Un portinaio trova pinguino
           A porter finds penguin

Thus, across various populations, children and agrammatic patients, and in various registers, we found a subject/object asymmetry in article omission. This asymmetry cannot be attributed to prosodic factors, at least not alone, as it is still present in children when they have access to complex prosodic structures. In addition, prosodic factors cannot be advocated in the case of adult agrammatic patients or headlines.

## 2.6  An attempt towards a multi-facet explanation

The main facts that we have collected in this excursus and that need to be explained in a unified framework are the following:

1.  Phonological factors may affect the production of articles at least initially.
2.  There are variations among languages in the rate and in the timing of article use/ omission.
3.  Article omission is influenced by the syntactic context: subject/object asymmetry.

Guasti et al. (2008) proposed an account of article omission in terms of missetting of Chierchia's (1998) Nominal Mapping Parameter (NMP). This parameter regulates the mapping between nominal syntactic categories and semantic types. Languages vary as to this mapping. In Italian, and generally in Romance, nouns are mapped into the semantic type [+pred(icate) −arg(ument)] and thus are predicate denoting. To turn them into arguments, an article must be used in all contexts (with the exception of mass and plural nouns in complement positions). Typically, these languages have a complete paradigm of articles (definite, indefinite, partitive, singular and plural), as seen in Table 2.1 and have plural morphology. In Chinese, nouns are mapped into the semantic type [+arg −pred], that is, they come out from the lexicon as arguments and thus can be used bare in argument positions. Typically, in languages like Chinese, there is no article, no plural morphology and there are classifiers. In Germanic languages, like English and Dutch, nouns can be mapped into [+arg or +pred], a choice that is lexically determined. If a noun is [−arg +pred], it will have to be accompanied by an article in order to be used in argument position (as in Italian). If it is [+arg −pred], it is used without articles (as in Chinese) and this is possible for mass and plural nouns, but not for singular count nouns. Germanic languages are like Romance languages in that there are articles, there is plural morphology on nouns, but the article paradigm is not complete, as there is no partitive article. The mapping is summarized in (15).

(15)  N → +pred −arg  (Italian and Romance)
      N → +arg −pred  (Chinese)
      N → +arg +pred  (English/Dutch/German)

Chierchia (1998) proposed that the default setting is [+arg −pred], i.e. the Chinese setting. On this view, all learners, regardless of the language of exposure, start to use bare nouns in all argument positions. This means that we should observe a stage in development, in which children do not produce articles, although they produce multiword combinations. This prediction is hardly fulfilled for Romance. Articles are used from very early on, and when the child does not yet know the target form, s/he uses MPHs. In fact, a period in which articles are absent is hardly attested. This means that Italian-speaking children know that articles have to be used, even when the paradigm is not yet completely learned. A stage in which articles are absent from the child's speech is attested in Germanic languages, e.g. in a Swedish-speaking child (Bohnacker 1997), in a German-speaking child (Eisenbeiss 2000) and in a Bernese speaking child (Penner & Weissenborn 1996). However, even for Germanic languages, this evidence

is disputable. Experiments conducted with English (Shady 1996) and German stimuli (Hoehle & Weissenborn 2003) have shown that from 12 months and from 8 months, respectively, infants are particularly sensitive to articles, i.e. they have already figured out that articles are used in their language. These facts suggest that we cannot maintain the assumption that children start by assuming the Chinese setting, even for those languages, like Germanic languages, where a complete absence of articles is observed in the first multiword combinations. In the light of the facts reviewed, we propose that prosody bootstraps the use of articles or MPHs, as argued by Lleó and Demuth's (1999). Because children are particularly sensitive to the prosodic structure before age 2, they know whether their language has articles or not. This assumption accommodates the fact that German- and English-speaking infants are sensitive to articles well before the end of their second year. Thus, it seems fair to assume that children speaking languages with articles do not pass through a Chinese phase. Thus, at the outset of production, children exposed to languages featuring the presence of articles could choose either the German or the Romance setting. The choice of the Romance setting would require children to have established that the article paradigm is complete; but we have seen that Italian-speaking children acquire the various forms of articles gradually. The German setting requires children to have noticed the presence of articles and plural morphology in their language. Based on previous findings, we conjecture that children start with the German setting.[3] This hypothesis accommodates what they heard in their language (they heard articles) and does justice to the fact that Romance children find some instances of bare nouns in the input: mass and plural nouns in the object position. Similarly, Germanic-speaking children hear bare nouns: mass and plural nouns in the subject and object positions. Thus, based on prosodic evidence and lack of acquisition of the full paradigm of articles, children exposed to languages with articles assume the Germanic value of the NMP. In the first stage Italian-speaking children omit articles optionally, because they are assuming the German setting of the NMP.[4] Remember that to choose the Romance setting, one needs to have evidence that the paradigm of articles is complete, that is, that there are article forms which encode the features: definite, indefinite, partitive. The German setting requires that when children learn a new noun, they have to establish its mapping: [±arg] or [±pred]. If a noun is wrongly classified as [−pred, +arg], it will be used without an article, even

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**3.**   As we said earlier, Germanic-speaking children may omit 100% of articles in the initial conversational sessions. These children too are operating under the Germanic value of the NMP. The higher omission rate has to be ascribed to additional factors, such as prosodic properties of articles and of the lexicon, as suggested by Lleó and Demuth (1999).

**4.**   The choice of the German setting is dictated by the subset principle. If the child assumes that the article paradigm is not complete, as in the German setting, it is enough to learn partitive articles to switch to the Romance setting.

if it is neither mass nor plural.[5] If it is classified as [+pred, −arg], it will be accompanied by an article. When children say *voglio mela* (I want apple), they are (mis)analyzing the noun *apple* and take it to be of the semantic type [+arg]. In this approach, the optional article omission is due to the miscategorization. Germanic-speaking children, at an initial stage, also omit articles, because they are making miscategorization errors, as Italian-speaking children in the same stage. Article omission is higher in Germanic languages than in Italian (or Romance) and article use may occur earlier in the latter languages than in the former ones. These two facts do not follow from the NMP. We assume that they follow from phonological properties, i.e. the availability or lack thereof in the lexicon of a prosodic model for the integration of articles in combination with the way articles are prosodified in a particular language (see Lleó & Demuth 1999, and for Italian Giusti & Gozzi 2006). Thus, at Stage I, prosody guides the child to establish whether his language has articles or not. In addition, it offers a model for the integration of articles. Thus, at this stage, Romance children will use articles more consistently than Germanic children, because they follow the models for the integration of articles offered by the lexicon and illustrated in Table 2.9 (where our stage corresponds to stage II). When children start to use articles or MPHs with bisyllabic words, they use the prosodic structure of trisyllabic words as a model. Notice that trisyllabic words are frequent in Italian, as shown in Guasti and Gavarrò (2003).

In Dutch articles are either proclitic to the following word, like in Italian, or enclitic to the preceding words. Thus, the lexical model for the integration would be wS or wSw (for proclitic articles) and Sw for enclitic articles. At the lexical level, many words are monosyllabic or bisyllabic with a Sw pattern; trisyllabic words with the wSw pattern are rare (Guasti et al. 2008). Thus, in Dutch, the way of prosodifying articles is ambiguous, enclitic or proclitic, and a lexical model offered by words (WS) is only frequently available for enclitic articles. We conjecture that these two factors combined contribute to the higher article omission in Dutch than in Italian. Things are different in German. In this language, articles are foot and form a prosodic word attached to another prosodic word, if they are full forms, or they are cliticized to the previous word, if they are reduced, as shown in (16).

(16)   a.   $[_{PW} [_F$ der]] $[_{PW} [_F$ Mann]]
              The              man

       b.   $[_{PPh} [_{PW} [_F$ noch] n]] $[_{PW} [_F$ Kipper]]]
                   still    a          damper

Thus, on the one hand, the prosodic structure for the integration of articles is complex, as prosodic words with two feet are not found in the early stages, according to

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5.   Learning whether a noun is [±arg] or [±pred] is similar to learn whether a noun is masculine or feminine, independently of whether these features are overtly marked.

Lleó and Demuth (1999). On the other, there is also a question of ambiguity in the prosodic status of articles (feet or enclitic forms) and, because of this ambiguity, there is ambiguity in the way of attaching them. Similarly, to what we have seen in Dutch, these factors may be responsible for the later appearance of articles and for the higher omission rates in German, as well. In conclusion, omission depends on the (mis) setting of the NMP (Germanic value); cross-linguistic differences are attributed to phonological properties of articles, to ways of prosodifying them and to the presence of models for the integration of articles at the lexical level.

At Stage II in (18), Romance children have set the value of the NMP correctly and no longer omit articles, because they have discovered that their language has a full paradigm of articles: it has definite singular and plural articles and indefinite singular and plural articles, partitive articles like *dei gatti* (which roughly corresponds to English *some cats*). German and Dutch children, who already did set the NMP to the correct value at stage 1, behave differently: German-speaking children are like their Italian peers. As the prosodic complexity of integrating articles may be similar in German and Dutch, we must conclude that prosodic factors are no longer responsible for article omission. To account for these asymmetries between Dutch and German, we can follow Guasti et al. (2008) and attribute the persistent and higher omission in Dutch to pragmatic constraints. In spoken Dutch, but neither in Italian nor in German, bare singular nouns, both in subject and object position, are acceptable when the speaker and the listener share some common knowledge (the character described is familiar to both or they are witnesses of the event described). This kind of examples may further confuse Dutch-speaking children and lead them to misanalyze nouns as being [+arg] to a higher extent than in German.

(17)    Dat  is  een  meisje  van   twee  huizen  verderop.  **Meisje**  van    een  jaar
This  is  a    girl    from  two   houses  away.       Girl     from  a     year

of  zes/zeven.
of  six/seven

'This girl lives nearby. Girl aged about six/seven years.'          (Peter)

When Dutch children realize that examples like (17) are subject to strict pragmatic constraints, they cease to omit articles.

We can summarize the proposal in (18):

(18)

Stage I

Prosody bootstraps the sensitivity to articles (8 and 12 months)

Germanic setting in all languages with articles → optional omission of articles
Presence (and lack of ambiguity) of a phonological model for the integration of articles → early use and different rates of omission (Romance vs. Germanic languages)

Stage II
> Full paradigm of articles → Romance setting of the NMP
> Bare singular nouns in Dutch → longer omission than in German

One last point that deserves discussion concerns the subject/object asymmetry found in Italian. Why is the subject position more prone to article omission or simplification than the object position? Mezzenzana (2009) argues that subjects are more complex to integrate in the syntactic structure than objects, because they involve a type of complex merging operation, in which a phrase is merged, so to speak, to another phrase and not to a simple head (as in the case of objects, which are merged to the verbal head). The intuition that subjects are more difficult to integrate in the syntactic structure than objects seems to us on the right track and we would like to argue that this is because children simplify structures when the prosodic and the syntactic structures are not aligned. Building on these ideas, we would like to suggest that children find the integration of subjects more complex than that of objects, because there is a possible misalignment of the prosodic and syntactic structure in the former case, but not in the latter. From the syntactic point of view, objects are maximal projections generated as sister of the verbal head and included in the maximal projection of the verb. In the prosodic hierarchy, they form a phonological phrase (φ) and, in certain circumstances, they are restructured into the phonological phrase including the verb. In both cases, they are part of the same intonation phrase (I) including the Verb, as seen in (19).

(19) a.   $[_{VP}$ V DP]                                                    syntax
     b.   $[_I [_\varphi$ V] $[_\varphi$ DP]] or $[_I [_\varphi$ V DP]]      prosody

Subjects are DPs located in the specifier of some verbal projections, say vP, and typically move to another specifier, that of IP (when they are in pre-verbal position). At the prosodic level, they form a phonological phrase that may or may not be part of the same intonational phrase containing the verb and the object (we omit the two possible ways of prosodifying the objects).

(20) a.   $[_{IP}$ DP$_i$ I $[_{vP}$ t$_i$ $[_{VP}$ V DP]]]                           syntax
     b.   $[_I [_\varphi$ DP] $[_\varphi$ V DP]] or $[_I [_\varphi$ DP]] $[_I [_\varphi$ V DP]]]    prosody

Objects and verbs are always part of the same I phrase. By contrast, subjects may form an I phrase on their own. In a sense, they are less close to verbs than objects. Thus, at the level of I, there is alignment of the syntactic and prosodic hierarchy as far as objects are concerned. Alignment cannot obtain for subjects and this creates trouble for the integration of subjects and is responsible for the simplification of phrases including subjects, hence, for the higher article omission in that position.

## 2.7  Article omission in non-initial positions: Complement of prepositions

Although in clause internal positions article omission is lower compared to sentence initial position, there is a vulnerable context for the article omission in non-initial positions: the complement of a preposition. Ferrari and Matteini (2010) carried out an analysis of the spontaneous production of one child from 1;11 to 2;6 and found article omission being higher after a preposition (49%) than in other positions, such as the subject position (33%), the object position (19%), or in isolation (23%). While article omission is the prevalent pattern in prepositional contexts, omissions of the preposition itself or of both the preposition and the article are also found, as illustrated in (21). In (21c), the preposition *di* (of) would form a single word with the article (*della*, of+the).

(21)  a.  Mette cassettino (missing preposition + article *nel,* in+the)
          (he) puts (in+the) drawer

      b.  Con principe (missing article: *il,* the)
          with (the) prince

      c.  Paura la matrigna (missing preposition *di*, of)
          (I have) fear (of) the stepmother

Ferrari and Matteini point out that there is a clear development in the use of articles in prepositional contexts. In the period from 1;11 to 2;2 use of articles in PP contexts is 28%. In the second period from 2;3 to 2;6, it is 52%. According to Ferrari and Matteini, this residual phenomenon of omission after a preposition originates from two interacting factors: (i) articulated prepositions are syncretic in Italian, (ii) D and P compete to provide functional structure to the NP. According to Cardinaletti and Giusti (2015) articulated prepositions are obtained through a process of incorporation of the D into P, as in (22). After incorporation of the article *la* (the-fem.sg) with the preposition *di* (of), the articulated preposition *della* is obtained.

(22)  $[_{PP} [_P \text{ di}] [_{DP} [_D \text{ la}]] \rightarrow [_{PP} [_{P+D\ i} \text{ della}] [_{DP} t_i ]]$

The omission of the article releases children from the complexity inherent in the process of obtaining an articulated preposition. This hypothesis is supported by the fact that the child does not omit articles when the process of forming a syncretic preposition does not apply, as with the preposition *per* (for).

(23)  pe la mamma (adult form *per la*)
      for the mother

Beyond the difficulty in forming articulated prepositions, an additional cause of article omission in prepositional contexts is the child's assumption that there is complementary distribution between P and D, as both provide functional structure to nouns.

To avoid this structure, the child chooses to drop either the article or the preposition. Although this observation is plausible, this conjecture would lead us to expect an equal rate of omissions of articles and of prepositions, but this was not what Ferrari and Matteini found: articles were omitted twice as much as prepositions (articles: 34% vs. prepositions: 14%). Although additional investigations are certainly needed, especially as the acquisition of prepositions is a neglected area, we think that the process of forming articulated prepositions alone is a good candidate for explaining the difficulty children face.

## 2.8    Acquisition of articles in the bilingual children and adult L2 learners

A few studies have investigated the use of articles in bilingual children reporting a pattern similar to that found in monolingual children. Kupisch (2007a) investigated article use in 4 bilingual German-Italian-speaking children (1;6–2;11) in a longitudinal study; two were balanced bilinguals (Carlotta, Lukas) and 2 were unbalanced, one toward Italian (Marta) and the other toward German (Jan). She compared these bilingual children with monolingual children speaking either Italian or German (see also Kupisch 2006, 2007b).[6] The bilingual children started to use articles between 1;6 (the Italian dominant) and 2;2, a bit later than (some) monolingual children; initially, they all omitted articles much more frequently than their monolingual peers and they did so equally in their Italian and German (3 out of the 4 children omitted 100% of the time for at least one session). The two balanced bilingual children displayed an almost similar development in the two languages and started to converge to the adult system at 2;4 and at 2;6. Compared to monolingual Italian learners, they displayed a delay up to 2;3; afterward their development was like that of monolingual controls. Compared to monolingual German-speaking children, the bilinguals omitted less and for a shorter period. Thus, the data from the two balanced bilinguals speak in favor of a positive influence from Italian to German. The consistent use of articles in Italian boosts the use of articles also in German. As for the two unbalanced bilingual children, one (Marta, Italian dominant) showed a similar development in the two languages and started to converge to the adult system around 2;4. Her development was like that of monolingual children in Italian, but she was slightly ahead of monolingual children in German. The other child, who was dominant in German, omitted articles in Italian more frequently than in German, but also in German he was not very consistent in the

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6.   Kupish (2007a) established dominance in one language through various measures: MLU, Upper bound (the longest utterance), number of utterances per 30 minutes of recording, increase of the noun and verb lexicon.

use of articles. Hence, the poor performance in Italian may be due to language dominance, but also to a general slower development. Thus, with the exception of the last child, bilingual children are delayed at the onset of article use in Italian and they get left behind for some months, but they catch up very quickly. In addition, Italian seems to enhance the consistent use of articles also in German, in that it boosts children's use of article in German and this puts bilingual children ahead of their German-speaking monolingual peers. This fact also demonstrates that bilingual subjects are not the sum of two monolingual subjects, as a discrepancy between Italian and German would have been expected in this case. Although in bilingual children, the two languages are distinct from the onset (see Bosch & Sébastian-Galles 1997; Genesee 1989; Meisel 1989), there is influence in the development of the two languages.

Another study was carried out by Bernardini (2003) with 2 Swedish-Italian-speaking children, Lina and Lukas (1;8–3;7). Italian and Swedish are different in that Swedish has enclitic articles, i.e. the indefinite article follows the noun. The definite article, instead, precedes the noun (it is proclitic), as in Italian. These children started to produce articles at 1;8 and at 2;3, respectively. One child, Lina, omitted even a bit less than Italian monolinguals (38% omission at 1;8) and at 2;8 ceased to omit articles (no information is provided about her Swedish). The other child, Lukas, did not use articles at all in the first Italian transcripts and omitted a lot until to 2;4, but then there was an abrupt decrease in omission rates. In contrast, this child omitted very few articles in Swedish from the start and from 2;4 there is parallel development in the two languages. Thus, this child too seems to be initially delayed in the first stage, but then he catches up rapidly.

Bernardini studied the use of articles in two adult learners of Italian with Swedish as their L1 (age 32 years). These adult learners had lived in Italy for one year and taken private tuitions. The learners started to omit articles 75% and 57% of the time. After 3 months in Italy, the omission dropped to 36% and 10% and there was a continuous decrease in one of the learners, while the other did not improve very much. A different picture emerges from other adult L2 learners having Chinese or Persian as their L1 (Chini 1995; Valentini 1992, respectively): they omitted articles completely. We may note that the mother tongues of these subjects do not have articles and this may have a negative influence on their L2. Thus, overall, the use of articles seems more difficult for adult L2 learners than for children and seems to be influenced by the L1. Adult learners, whose L1 has articles with the same distribution as they have in Italian (i.e. preceding the nouns, as in German), also do not have problems with articles. Articles are already used by non-advanced speakers, in contrast to clitics which are phonologically identical (Leonini 2006a, b).

Like in monolingual Italian, bilingual children make very few errors of commission. Gender on articles is acquired quickly by the German-Italian and Swedish-Italian bilingual children. Gender errors total to 3% and are qualitatively similar to those

found in monolingual children, i.e. changes of the vocalic ending of the noun to be harmonized with the article or changes of the article to be harmonized with the noun ending (Kupisch et al. 2002; Bernardini 2003).

(24)  a.  Le ouve [=uova]   the eggs   (Lukas, 2;11) (from Kupisch et al. 2002)
      b.  Lo gatto [=il]    the cat    (Carlotta, 2;3)
      c.  I api [=le]       the bees   (Lukas, 3;33) (from Bernardini)

Number seems to be acquired a bit later than gender, as it is the case also in monolingual children, but number errors are also few (see also Chini 1995). In contrast to children, gender is problematic for adult L2 learners (Chini 1995; Bernardini 2003). The two Swedish-Italian adults mentioned above make gender errors all along the period investigated, with progress being observed in one adult, but not in the other. Other studies report transfer of gender from L1 to L2, and consequent errors in L2 (Chini 1995). Number is reported to be rather accurate (90% correct).

   It is evident that the use of articles by bilingual children is not a major defeat. The development of the bilingual children we examined was not very different from that of monolingual peers; the delay was quickly caught up and the convergence to the adult target was more or less within the time observed for monolinguals. We also pointed out that there is influence on the use of articles. Italian enhances the use of articles in German. Adult learners find article use more difficult than children and their use seems to be influenced by the properties of their L1.

## 2.9   Article omission in children with Specific Language Impairment

Article use is vulnerable in children with SLI. Looking at the spontaneous speech of 11 children with SLI with a mean age of 6;3 years (age range: 4;2–10;7), Bottari, Cipriani, Chilosi and Pfanner (1998) offer the following conclusions:

(25)  a.  Articles are almost absent in the production of some children with SLI and article omission is generally high

      b.  Article omission and MLU dissociate.

      c.  The omission rate of articles and of other functional morphemes dissociate

The first and second conclusions are supported by the data reported in Table 2.11, where we have the rate of article omission for each of the children with SLI, their age and their MLU. It is evident that 4 children almost never use articles. These high percentages of article omission are not found in the Italian typical development, as discussed earlier. Notice also that 2 of these children are relatively old and the MLU of 3 of them is relatively high. Compared to the results in Tables 2.2, 2.3 and 2.4 and taking into account that in those tables the figures refer to use of articles, the percentages of

omission in Table 2.11 are quite high. Looking at other children, we observe that even with an MLU above 3, there is still a fair amount of omissions. In addition, Bottari et al. (1998) point out that some children use some elaborate constructions (e.g. modal plus infinitive) that typically occur in a more advanced stage of development than the one in which these children are (based on article use). These observations suggest that these children with SLI are following a developmental path that is different from that of children with typical development (TD). This conclusion is corroborated by the fact that MPHs, which are found in typical development, are never observed in the speech of children with SLI.

**Table 2.11.** Age, MLU and percentage of article omission in 11 Italian-speaking children with SLI ranging in age from 4;2 to 10;7 (mean age 6;3). Spontaneous data from Bottari, Cipriani, Chilosi and Pfanner (1998)

| Child | Age | MLU | Article omission |
|---|---|---|---|
| SS | 5;2 | 2.7 | 100 |
| Mfun | 4;2 | 1.5 | 100 |
| Mfan | 6;2–8;6 | 2.2 | 95 |
| EG | 8;4 | 2.8 | 95 |
| JM | 4;3 | 2.3 | 87.5 |
| Mfab | 6;2 | 2 | 83 |
| JT | 4;11 | 4 | 80 |
| SG | 6;0 | 3.7 | 78.1 |
| DG | 4;9 | 3.5 | 63 |
| AR | 8;2 | 2.4 | 56.5 |
| PF | 10;2 | 2.2 | 55.5 |

As to the second conclusion, Bottari et al. (1998) found that articles are more frequently omitted than the copula, auxiliaries and prepositions. Table 2.12 reports the means and standard deviations of omissions of these morphemes for the whole group of children with SLI.[7]

Articles are omitted more often than prepositions, although both provide functional structure to the noun. The copula, which is a monosyllabic item, prosodically weak like articles, is essentially not omitted, while auxiliaries are, although less frequently than articles. The findings that article use is less accurate than the copula

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7. Bottari et al. (1998) found that articles are omitted more frequently than clitics, in spite of the fact that there is homophony. This dissociation is found in other studies on Italian (Leonard, Bortolini, Caselli, McGregor & Sabbadini 1992) and in other Romance languages (see Jakubovicz et al. 1998 for French), but it takes the opposite direction.

**Table 2.12.** Means and standard deviations (SD) of omission of various free standing morphemes in 11 Italian-speaking children with SLI ranging in age from 4;2 to 10;7 (mean age 6;3). Spontaneous data from Bottari, Cipriani, Chilosi and Pfanner (1998)

|       | Article | Copula | Auxiliaries | Preposition |
|-------|---------|--------|-------------|-------------|
| Mean  | 81.2    | 12.9   | 67          | 41.2        |
| SD    | 16.56   | 15.97  | 38.06       | 17.6        |

use is also reported in Bortolini, Caselli & Leonard (1997) with a different group of children with SLI (Mean age 5;2). This study, unlike that of Bottari et al. used an elicitation method. The authors found that children with SLI used less articles than aged and language matched control children (i.e. children aged 3;7). In the use of copula, instead, children with SLI did not differ from the two control groups (for a dissociation between articles and clitics, with the former being supplied more frequently than the latter see Chapter 3, Section 4.1 and Pozzan 2006; see also Leonard, Bortolini, Caselli and Sabbadini 1993).

Articles are hard not only in production, but also in comprehension, according to Leonard et al. (1992). Accuracy rate in comprehension is 62%, while plural morphemes on nouns and third person singular morphemes on verbs are comprehended with an accuracy rate reaching 80%. Thus, children with SLI have problems with articles and most of the time omit them or fail to comprehend. According to Leonard et al. (1992), 5-year-old children with SLI are weaker than 3;5 year-old children with TD in the production and comprehension of articles.

Articles are not only challenging for children with SLI, but also for children with Down Syndrome (DS). Caselli, Monaco, Trasciani and Vicari (2008) compared the use of articles in children with DS (N = 16, age range 3;5–5;7) matched to children with SLI and to children with TD (N = 32, age range 3;8–5;7) on mental age. Production of articles was measured with the phrase repetition test (De Vescovi & Caselli 2001). It was found that children with DS omit articles more frequently than children with SLI (35% vs 15%); in turn, children with SLI omitted articles more frequently than children with TD (1%). In the same study, it was found out that children with DS omitted more prepositions than children with SLI, which in turn omitted prepositions more often than children with TD did.

Why are articles vulnerable for children with SLI? Bortolini and Leonard (1998) holds that the critical factor is prosodic in nature. Children with SLI are poor at repeating non-words; especially in the case of 3 or 4 syllable non-words, children with SLI often omit the non-final syllable. This means that rather than producing a word with the stress pattern wSw, they produce only Sw (*farfàlla*, (butterfly), becomes *fàlla*), or in the case of four syllable words with the stress pattern wSww, they produce Sww. Recall that wSw is a model for the integration of articles at the prosodic level, as it

is wSww (Section 6). The first syllable could be an article attached to the Sw or Sww word. Thus, the longer article omission in children with SLI may be due to prosodic difficulties: children with SLI have trouble in comprehending and producing weak non-final syllables at the word and phrasal level. In Section 6, we suggested that the availability, at the word level, of an unambiguous prosodic model for the integration of articles enhances children's production of articles in Italian, with respect to other languages. The present proposal entails that children with SLI benefit less than children with TD from this prosodic model. In addition to prosody, it could be argued that children with SLI operate for a longer time than children with TD under the Germanic setting of the NMP, because they have trouble figuring out that the article paradigm is complete in Italian. Therefore, they have no evidence for abandoning the Germanic setting.

As for the higher article omission by children with DS compared to children with SLI, Caselli et al. (2008) invoke the role of short-term memory. Children with DS are weaker than SLI in this respect, a conjecture supported by the shorter MLU in the former population than in the latter. However, short-term memory was not directly measured in the two populations.

A final point concerns the comparison of children with SLI and bilinguals or L2 children. It is often reported that these two populations share some resemblances, especially in the area of morphosyntax. In the case of articles, this similarity does not hold. Children with SLI start to use articles after children with TD and at age 5 they still have a level of article use achieved at age 3;5 by children with TD. Bilingual children also start to use articles a bit later than monolingual children do, but they catch up quickly, as just discussed.

## 2.10 The acquisition of nominal inflection in children with typical development and in children with SLI

We now turn to the acquisition of gender and number on nouns. Gender on nouns is acquired quickly and without many problems. Chini (1995) reports that in the speech of children, gender is correctly assigned. Few errors are noted like *una ventaglia* (target *un ventaglio*, a fan) and *una disenna* (target *un disegno*, a drawing) or changes of an unpredictable ending into a predictable one: *-e* is changed into *-o* (e.g. *\*il pettin-o*, rather than *il pettin-e*, the-masc-sing comb or *lo stival-o* rather than *lo stival-e* the-masc-sg boot, from Caselli et al. 1993). We may note that, in these cases, the article is adapted to the gender suffix of the noun. Thus, as far as agreement is concerned, it is correct, but the gender suffix on the noun is not the expected one. Notice that the gender is interpretable on the noun, as it is the noun that is changed in order to obtain a more transparent suffix. De Marco (2005), based on a longitudinal investigation of one

child, noted that initial productions were very tied to the input and some class changes are observed from a non-transparent class, like class III in Table 2.2 to a more transparent class, like class I: *l'elefant-o* rather than *l'elefant-e* (the elephant) or *il pedal-o* rather than *il pedal-e* (the pedal). Cipriani, Chilosi, Bottari and Pfanner (1993) report similar data: *pan-o* rather than *pan-e* (bread). De Marco also noted that the most representative classes in the child lexicon and in the adult input are class I (*-o*) and class II (*-a*). A breakdown of the percentages of nouns (*types*) in each class is given in Table 2.13.

**Table 2.13.**  Percentage of use of the nouns in the 3 classes (based on noun endings) in three periods by the child and by the adult caregiver. Percentages for singular and plural nouns are separate

|  | Class I -o/-i | | Class II -a/-e | | Class III -e/-i | |
|---|---|---|---|---|---|---|
|  | Singular | Plural | Singular | Plural | Singular | Plural |
| Child 1;03–2;1 | 30 | 14 | 33 | 7.5 | 11 | 3.7 |
| Adult | 35.5 | 10 | 37 | 4 | 6.9 | 1.8 |
| Child 2:2–2;7 | 30 | 9.7 | 30 | 11 | 14.6 | 3.6 |
| Adult | 16 | 7.6 | 24 | 6 | 9.5 | 2.6 |
| Child 2;8–3;8 | 38 | 42 | 38 | 40 | 20 | 12 |
| Adult | 37 | 44 | 41 | 31 | 17 | 11 |

The rows may not total up to 100% because we have not included irregular nouns. We may note from Table 2.13 that class I and II are the most represented both in the child' speech and in the adult' speech during the whole period. Class III is less represented. Singular nouns in all classes are more represented than plural nouns, with the exception of the last period, during which there is a sharp increase of plural forms. In the second period, one also finds the use of some numerals or quantifiers (*due*, two, *tanti,* many) proving that the concept of plurality starts to be acquired. Between the first and the second period, there is no quantitative differences in terms of percentages, while there is an increase in plural nouns in the third period. However, the raw figures show an increase of the types of nouns in the child's lexicon also from the first to the second period and to the third (133 different nouns in the first period, 194 in the second period and 679 in the third period). Moreover, irregular nouns appear in the second period and increase in the third period (*il dito*, the finger, *le dita,* the fingers). In some studies, regularizations are found *il dito* becomes *i diti,* the finger' (rather than the irregular *le dita*), *il braccio*, the arm becomes *i bracci*, the arms (rather that the irregular *le braccia*) (Calleri, Chini, Cordin & Ferraris 2003). De Marco (2005) also pointed out that in the first period the same noun appears either in the singular or in the plural and there is little productivity. In the second period, the same type

has a singular and a plural variant in the child lexicon and one observes generalizations like *cign-o cign-a*, swan-masc-sg, swan-fem-sg (in the target language only *cign-o* exists). In the third period, there is an explosion of the plural nouns, especially for the first two classes. However, these observations are based on the speech of a single child and would require replications on a more extensive corpus. In fact, Cipriani, Chilosi, Bottari and Pfanner (1992) reported that gender on nouns with oppositions (*bimb-o*, *bimb-a*, child-masc-sg, child-fem-sg, *brutt-o, brutt-a*, ugly-masc-sg, ugly-fem-sg) and agreement between the nouns and some adjectives was already correct before age 2;0 in some children they investigated. For other children this was observed between 2;0 and 2;2 years, i.e. gender and gender agreement seemed to be productive earlier than in De Marco (2005), who suggested that there was productivity only in the second period (2,2–2,7). Caselli, Leonard, Volterra and Campagnoli (1993) confirmed the early acquisition of gender based on a cross-sectional study of 34 children. They found 100% correct production of gender agreement between the noun and an adjective between 2;6–3;0 (2;6 was the age of the younger group in the study). Given that acquisition of grammatical morphemes generally take some time, the fact that in this age range there is a ceiling effect suggests that at earlier ages gender was already accurate. In the same study, a delay was observed in the acquisition of production of the plural nominal inflections. While singular noun inflection was 98% accurate between 2;6 and 3;0, plural inflection was 89% accurate, with a significant difference between the two percentages. From 3;6–4;0 (the second group) there is no longer any difference between singular and plural. The same asymmetry between singular and plural was observed in the age group 2;6–3;0 for articles, but was no longer evident from 3;6–4;0. Comprehension mimics production in that singular nominal inflections were more accurately comprehended than plural ones (95% versus 78%) in the first group (2;6–3;0), but not in the second one. The singular/plural asymmetry has been confirmed by Leonard, Caselli and Devescovi (2002) who showed a greater accuracy in the production of singular nominal inflections than of plural ones in a 2;0 year old group (2;5–3;1), but not in the older group (age 3;3–4;1). They also showed that in the younger age group plural on class II (*-a* → *-e*) was more accurate (97% correct) than in either class II (*-o* → *-i*) (92% correct) or III (*-e* → *-i*) (94%). Leonard, et al. (2002) investigated also the spontaneous production of the younger group of children and found that plural inflection was even more accurate than in the elicitation experiment: 92% in spontaneous production and 89% in the elicitation task. Early sensitivity to number marking has also been confirmed by Moscati and Rizzi (2014) through an experimental task in which children had to decide which of two puppets said it better. At age 3;6, children reached an accuracy level of 96.5%. In this task, nouns were all singular and the article was either singular or plural. Thus, what has been shown is that children at age 3;6 know that singular articles go with singular nouns. In future research, it would be important to establish whether this result generalizes by using also plural nouns.

Nominal plural inflections on nouns is also relatively accurate in Italian-speaking children with SLI. Bortolini, Caselli and Leonard (1997) reported that 5-year-old children with SLI produced 89.9% correct plural inflections and they were less accurate than age matched controls. No difference is found with respect to the language matched control children. This means that the use of plural is in line with their language level. This was not so for articles or third person plural inflections (see Chapter 1, Section 13) where children with SLI were less accurate than language and age matched controls. Finally Bortolini, Leonard and Caselli (1998) showed that 5;4 Italian-speaking children with SLI were more accurate in the use of nominal plural inflections than their English peers (92.6% correct versus 71%).

While number on nouns does not appear to be problematic for adult L2 learners, gender seems to be more problematic (Calleri, Chini, Cordin & Ferraris 2003). This is different from what is observed in children, who acquire gender smoothly.

In sum, nominal features are acquired easily; gender is mastered slightly earlier than number and errors are rare in child speech. Some overgeneralizations are found. Gender errors generally involve changes of class ending toward the most common classes (I and II) and thus an attempt to avoid non-transparent endings. Nominal plural inflections are less accurate than singular ones in the youngest children, but this asymmetry disappear around age 3;0. In the speech of children with SLI nominal plural inflections are also spared compared to other inflectional morphemes.

## 2.11    Morphological derivation: The diminutive

One of the derivational processes, which becomes productive early in Italian, is the formation of diminutives. These can be formed through various suffixes: *-ino*, *-etto, -uccio, -ello*, with the first two being the most frequently used. In a corpus of spontaneous production including 500.000 words, *-ino* was used with 63% of the words and *-etto* with 18% (De Marco 1998). The use of the diminutive is a typical feature of the child-directed speech. In fact, De Marco (2005), based on the spontaneous production of a single child, noted that there was a close similarity in the percentages of use of the diminutive in the child and in the caregiver speech. Between 1;3 and 2;1, diminutives represented 11% of the nouns in the child lexicon (percentages of types of nouns). In adult speech, they are 18%. Most of the time, the suffix *-ino* was used both in adult and in the child speech. The suffix *-etto* was present in child, but not in adult speech and the reverse holds for *-ello*. De Marco claimed that in this period, the use of the diminutive was not productive, although pairs of diminutives and simple nouns were found. Productivity started from age 2;2, when overgeneralizations were observed: *guant-ino* (little glove), which is correct, but also *guant-etto* (little glove), which does not exist. Although diminutives were used, they are not associated to the littleness or smallness

meaning. In fact, we have some diminutives like *acquetta* (lit. little water), *bagnetto* (lit. little bath). The meaning of littleness or smallness was acquired when its opposite, the augmentative meaning, was also employed, according to De Marco. At age 2;8, the child had the following conversation with the mother, in which the term *barboncino* (poodle) is not a diminutive in the target language, but is considered so by the child, *barba+ino*, because it has the diminutive ending *-ino*. In addition, *barbone* (tramp), which has another meaning in the target language, as proven by its English translation, is considered an augmentative by the child: *barba+one,* because it has the augmentative ending *-one*.

(26)  CHI:  mamma, quello è un barbone?
      Mom, that is a big poodle (=tramp)?
      'Mom, is that a big poodle?'

  MOT:  perché dici che è un barbone?
      why do you say it is a tramp?
      'Why do you say it is a tramp?'

  CHI:  perché è un barboncino grande.
      because it is a poodle big
      'Because it is a big poodle.'

In a survey of the speech of two other Italian-speaking children (Martina and Diana, Calambrone corpus), we found the presence of various diminutives from the first transcripts, both in the singular and in the plural, with an increase around age 2;3; augmentative were rare, but in one child it was already present at 1;11. We have to point out that in the Tuscan variety of Italian to which these children are exposed diminutives are abundant also in adult speech.

(27)  a.  Mucchine (Martina, 1;10)   little cows
  b.  figlini (Martina, 1;11)    little sons
  c.  maialino (Martina, 2;3)    little pig
  d.  canini (Martina, 2;3)     little dogs
  e.  soldini (Martina, 2;3)    little coins
  f.  paperina (Martina, 2;3)    little duck
  g.  cavallino (Martina, 2;3)   little horse
  h.  ghimmione (Martina, 1;11)  (target: scimmione) big monkey
  i.  bambolone (Martina, 2;4)  big dolly

Diminutives transform a noun belonging to a non-transparent class (ending with the suffix *-e*) into a noun with a transparent ending, as exemplified below, and this morphological modification could help the child in establishing gender of nouns:

(28)  a.  Il pesce → il pesciolino  (the fish, the little fish)
  b.  Il maiale → il maialino  (the pig, the little pig)

It is interesting to notice that the augmentative morpheme sometimes does the opposite, in that, it changes a noun belonging to the transparent class *-o* into one belonging to the III class (*-e*):

(29)  a.   Il cavallo → il cavallone      (The horse, the big horse)
      b.   Il topo → il topolone          (The mouse, the big mouse)

In addition, diminutives are generally based on count nouns, although in child-directed speech some mass nouns may be used with a diminutive suffix, such as *acqua* (water), which becomes *acquina*, or *carne* (meat), which become *carnina*. However, we did not find diminutives based on mass nouns in our survey of the speech of the two children (Martina and Diana). This restriction on the use of the diminutive could also help children is sorting count from mass nouns.

In summary, the morphological process, which obtains diminutives, is productive in child language from early on and is useful for the child to acquire aspects of the nominal morphology. The data reported are based on a single child and thus, they are in need of further support.

## Summary and questions for future research

Italian-speaking children start to use monosyllabic placeholders in front of nouns before age 2;0; soon after articles appearance and after a period of optional omission, children display target-like production around age 3;0. Children use singular forms before plural ones and both monolingual and bilingual children acquire gender at an early age. While production of articles has been widely studied, comprehension has been investigated rarely. One study with monolingual children shows that comprehension is more advanced than production, an unsurprising finding. In fact, in order to produce given structures or words, one needs to comprehend them.

Article omission is observed in many early languages, but crosslinguistic differences are noted, with higher article omission and a longer period of omission in Germanic languages compared to Romance languages, Italian included.

These findings have been explained by invoking Chierchia's Nominal Mapping Parameter combined with prosodic and pragmatic properties of the article system in a given language. Prosody bootstraps the use of articles, by providing models at the words level. Therefore, children start to use articles in an optional way and do so for a more or less longer time depending on the language of exposure and on whether the article system is complete, i.e. it fills each case of the article system, as displayed in Table 2.1. In addition, pragmatic uses of bare nouns may confuse children and lead them to omit for an even longer time.

While article omission is well attested and a widely studied phenomenon, it is not clear which type of article is omitted: definite, indefinite or partitive. Future research may address the nature of the omitted articles.

Article omission is observed in monolingual and bilingual speech. Interestingly, positive influence in the use of articles is observed in bilingual children, with Italian boosting the use of articles in German. In this respect, we note that bilingual children are not the sum of two monolingual children, as bilingual children may omit less in one language than monolingual children of that very same language may. L2 adults also omit articles and in that, they seem to be influenced by the availability or lack of articles in their L1. Although in this respect they seem to display a profile different from bilingual children, it should be noted that the languages of the bilingual children participating in the various studies we discussed do not lack articles. It would be interesting in future research to look more closely at the impact of typologically different languages on the use of articles in bilingual and L2 learners, both children and adults. How does a language without articles (and plural morphology) influence the acquisition of a language with articles (e.g. Chinese vs. Italian)? How does a language without articles, but with plural morphology influence the acquisition of a language with both (Slavic languages vs. Italian)? How does a language with enclitic articles influence a language with proclitic articles?

Finally, articles are omitted by children with SLI and children with Down syndrome, but in a different manner. Children with SLI at age 5 omit articles to the same extent as 3;5 year old children with TD and display an uneven profile, as their use of articles is not aligned with their linguistic competence in other areas of language. Children with DS omit more articles than children with SLI.

Articles are omitted for a longer time in the context of simple prepositions. Prepositions themselves are omitted, but we do not know which type of prepositions is omitted more frequently. One may conjecture that prepositions devoid of semantic contents may be more subject to omission than those with more semantic content (e.g. *di*, 'of' may be more omitted than *con* 'with') a finding for future research.

Articles have different uses, for example the generic use. The Italian sentence *I cani abbaiano* (Dogs bark) refers to dogs in general, not to a specific set of dogs. Interestingly, the availability of the generic interpretation depends on tense, as *I cani hanno abbaiato* (Dogs barked) does not refer to dogs in general, but to a specific set of dogs. When do children acquire this interpretation? (see Kupisch & Koops 2007; Kupisch 2012). Are they also sensitive to the tenses of the clauses? These are questions for future research.

Finally, we have concentrated on articles and inflections in the nominal system, but have not touched on the acquisition of the internal structure of the DP. Little is known about this, although some research has started to focus on this issue in a monolingual and bilingual perspective (Cardinaletti & Giusti 2010; Kupisch 2014; Waxman & Guasti 2009).

# The acquisition of pronominal clitics

## 3.1 Introduction

As is characteristic across Romance languages, standard Italian personal pronouns are realized through a double paradigm of strong (plus few weak) and clitic pronouns. The standard Italian strong paradigm expresses both subject and complement pronouns, whereas clitics are just complement pronouns. In the case of the strong paradigm, 1st and 2nd pronouns have a nominative – *io* (I), *tu* (you) – and a non-nominative form – *me* (me), *te* (you) –; all the other persons have one single form for both nominative and non-nominative, i.e. *lui/lei*[1] (he/him, she/her), *noi* (we/us), *voi* (you), *loro* (they/ them). Complement clitics have a Case morphology. They may have accusative masculine and feminine forms (corresponding to a DP object), sometimes distinct from dative, genitive/partitive/oblique, locative (corresponding to a PP argument) as in the case of the 3rd person. Although we will concentrate here on third person accusative object clitics, Table 3.1 also includes dative, genitive, oblique and locative clitics to provide a complete illustration.

**Table 3.1.** Italian third person clitics

| Case | masc, sing | fem, sing | masc, pl | fem, pl |
|---|---|---|---|---|
| **Accusative** | *lo* (him) | *la* (her) | *li* (them) | *le* (them) |
| **Dative** | *gli* (to him) | *le* (to her) | *loro* (to them) | *loro* (to them) |
| **Genitive/ Partitive** | *ne* $_{\text{PP-}\textbf{di, def/indef}}$ (of him/a XP) | *ne* $_{\text{PP-}\textbf{di def/indef}}$ (of her/a XP) | *ne* $_{\text{PP-}\textbf{di def/indef}}$ (of them/some XP) | *ne* $_{\text{PP-}\textbf{di def/indef}}$ (of them/some XP) |
| **Oblique** | *ne* $_{\text{PP-}\textbf{da}}$ (from XP) | *ne* $_{\text{PP-}\textbf{da}}$ | *ne* $_{\text{PP-}\textbf{da}}$ | *ne* $_{\text{PP-}\textbf{da}}$ |
| **Locative** | *ci*$_{PP\text{-}\textbf{a}}$ (to XP) | *ci*$_{PP\text{-}\textbf{a}}$ | *ci*$_{PP\text{-}\textbf{a}}$ | *ci*$_{PP\text{-}\textbf{a}}$ |

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**1.** The weak masculine nominative form *egli* as well as the feminine nominative form *ella* have become obsolete in current standard Italian and very unlikely to be present in the primary data for the child. Similarly for the plural masculine and feminine 3rd person forms, *essi, esse*. The remaining weak dative pronoun *loro* (Cardinaletti (1991)) belongs to a relatively high stylistic non-colloquial level in current Italian. On the tripartition of personal pronouns in strong/weak/ clitics see Cardinaletti & Starke (1999).

Accusative and dative are not distinct in the 1st and 2nd person singular and plural in which gender is also neutralized: $mi_{1st, sing}$, $ti_{2nd, sing}$, $ci_{1st, pl}$, $vi_{2nd, pl}$.

The most salient feature of the distribution of Romance-type clitics is that they are all verbal clitics. They are phonologically weak elements that do not carry stress, hence in this sense they are phonological clitics. They are also syntactic clitics as they are not found in the regular complement position, contrary to (phonologically) strong pronouns.[2] Thus, in VO Italian, in which a lexical object or an object which is a strong pronoun normally follow both the finite and the non-finite verb (in the unmarked word order) as illustrated in (1), a complement clitic fills a different dedicated position in the clause structure: it precedes the inflected verb (carrying tense and φ-features) or the auxiliary in periphrastic verbal forms, hence it is proclitic (2)a, b, and follows the non-finite verb form, hence it is enclitic (2c–f):

(1)  a.  Ho incontrato/Incontrai Gianni davanti al cinema
         (I) have met/met Gianni in front of the movie theater

     b.  Ho incontrato/Incontrai lui davanti al cinema
         (I) have met/met him in front of the movie theater

(2)  a.  L'ho incontrato davanti al cinema
         (I)him-cl have met in front of the movie theater

     b.  Lo incontrai davanti al cinema
         (I)him-cl met in front of the movie theater

     c.  Penso di averlo incontrato davanti al cinema
         (I)think to have him-cl met in front of the movie theater

     d.  Penso di incontrarlo davanti al cinema
         (I)think to meet him-cl in front of the movie theater

     e.  Avendolo incontrato/Incontrandolo davanti al cinema, ho pensato che mi avrebbe salutato
         Having him-cl met in front of the movie theater, (I) thought that (he) me-cl would have greeted
         "Having met him in front of the movie theater, I have thought that he would have greeted me"

     f.  Incontratolo davanti al cinema, ho deciso di salutarlo
         met$_{pst\ prt}$ him-cl in front of the movie theater, (I) have decided to greet- him-cl
         "Once met him in front of the movie theater, I have decided to greet him"

---

**2.**   They are different from other types of pronominal clitics, e.g. of the Slavic or Germanic type (i.e. German and Dutch) which have very different distributional properties.

The process of cliticization has earned a lot of attention in the theoretical literature over the last forty years or so, for which various analyses have been proposed (Kayne 1975; Borer 1986; Sportiche 1996; Belletti 1999, 2001a; Cardinaletti & Starke 1999). Without going into the details of individual proposals and accounts, following Belletti (1999) the essential ingredients of the cliticization process may be assumed to involve the following steps: the DP whose head is the D-clitic pronoun undergoes phrasal movement in a first part of the derivation and head movement in the last step of the derivation, incorporating into the verbal head, which fills the relevant inflectional head hosting it. The following schematic representation in (3) illustrates the described steps, with V preceding/higher, as in enclisis or following/lower, as in proclisis, the clitic pronoun:

(3)    $(V/Aux_{-fin})$ $[_D CL]$ $(V/Aux_{+fin})$ …… $[_{DP} \langle [_D CL] \rangle]$ …… $\langle [_{DP} [_D CL]] \rangle$

This mixed-type displacement, as both a phrase and a head, may (at least in part) formally characterize the complexity of the process.

As is well known, use of either the strong form of the pronoun or the clitic form is not free in Italian. While (1)b is a perfectly grammatical sentence in Italian, it cannot be used as a simple alternative to (2)a, b. Specific discourse-pragmatic conditions are necessary to make a sentence like (1)b naturally acceptable. For instance, it can serve as a correction or disambiguation as in (4)a, b. In regular conditions favoring use of a pronoun, Italian necessarily requires use of a clitic, (4)c:

(4)    a.    Ho incontrato lui davanti al cinema, non lei
             (I) met him in front of the movie theater, not her

       b.    Ho incontrato lui davanti al cinema, mentre lei non c'era
             (I)met him in front of the movie theater, while she was not there

       c.    Hai incontrato /incontrerai Gianni davanti al cinema? Sì, l'ho incontrato/
             lo incontrerò
             Have you met/will you meet Gianni in front of the movie theater?
             Yes I him-cl met/will meet

Given their peculiar distributional properties, it is no surprise that the acquisition of clitic pronouns has attracted a lot of attention in the acquisition literature. This has generally been the case across Romance, in which clitics always have a distinct distribution from that of lexical complements or strong (and weak) pronouns, though not always of the Italian type, in particular as far as proclisis vs enclisis is concerned. More specifically, it is the acquisition of third person accusative clitic pronouns that has been studied in detail.[3] Italian is no exception to this privileged interest (Varlokosta et al. 2011 for a recent cross-linguistic study).

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**3.**    Only some recent studies start addressing the acquisition of the genitive/partitive clitic *ne*, but the results are still preliminary and will not be discussed in detail here; see Gavarró et al. (2012).

A further reason for the attention that Romance clitics has attracted in acquisition studies can be recognized in the fact that strong or weak pronouns of the type appearing in languages like e.g. English – him/h'm – are generally taken to be acquired and produced with no special problems in development whereas complement clitic pronouns seem to be somewhat harder. Specifically, a stage has been frequently detected in L1 acquisition in which clitics appear to be omitted in contexts in which they should be obligatorily present. Data from spontaneous production suggest an omission period in the early stages of acquisition. The data are strong in that they have been confirmed through controlled experiments of elicited production. Although the literature on the acquisition of strong/weak pronouns is not equally rich and integrated with controlled experimental results of the same type (but see Section 5 for some qualification on this point), spontaneous production data suggest that an equally clear omission stage is not detectable in the L1 acquisition of e.g. a language like English. For instance, the corpus analysis in Serratrice, Sorace and Paoli (2004) of four English speaking monolingual children from the CHILDES database, age range 1;10–4; 7, has counted a very low rate of object omissions in these children; applying exactly the same counting criteria to the equivalent corpus analysis of six Italian speaking monolingual children from the CHILDES database, age range 1;7 – 3; 3, the authors have documented a higher rate of omissions in these children.[4] Considering a language like French, objects clitics have been shown to be acquired later than weak subject pronouns, which are phonological clitics (Hamann et al. 1996): subject clitics are present from the early productions in child French, whereas complement clitics appear about four months later in the corpora studied (files from one child, age 2;0–2;10, Hamann 2008 for an overview; Chillier-Zesiger et al. 2010; Schmitz & Müller 2008 for French/Italian comparison). Bringing into the picture also adult and child L2 acquisition data, the conclusion supported seems to be that the acquisition of clitics is indeed more problematic than the acquisition of strong/weak pronouns (Belletti & Hamann (2004), Hamann & Belletti (2006) on French with comparison with Italian; Section 3 for more): clitics are hard to produce in the L2 Italian of speakers whose L1 is a language without clitics; in the mirror situation no comparable difficulty in the production of strong/weak pronouns has been described.

Although somewhat hard to acquire in L1, however, complement clitics are always correctly produced by children from their very first appearance. Hence, object clitics are either absent in the omission stage or they are correctly produced by children. This

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4.   These data are thus coherent with the classical findings in Bloom (1990), in which objects omission was significantly lower than subject omission and reached the highest rate of 15% (in the relevant contexts, i.e. verbs taking an obligatory object) in one child, Sarah age range 2;3–2;7, and only 8% and 7% in Adam and Eve age range 2;3–2;7 and 1;6–1;10, respectively. But see Perez Leroux et al. (2008) for different conclusions.

seems to be a general finding in Romance, also confirmed by the Italian studies to be reviewed in this chapter. Children never misplace complement clitics, for instance (Guasti 1993/94); in contrast, this is a kind of mistake which is fairly characteristically found in L2 acquisition, though often to a limited extent and possibly depending on the target Romance language considered (e.g. French and Italian may not be totally alike in this domain as hinted at in Section 3, Footnote 29). The comparison between L1 and L2 acquisition in this respect is taken up at various points in this chapter.

Furthermore, that the acquisition of clitics is somewhat problematic is also revealed by the late appearance of clitics in children with SLI; again this is the case across Romance, Italian included (Section 4). Clitic production has been recently shown to be problematic also in hearing-impaired children with cochlear implants (Section 4.1). Though object clitics show up with some delay in children's productions, as clearly indicated by the French internal contrast between subject clitics and object clitics mentioned above, as well as by the omission stage which lasts up to age 3–4, yet object clitics are produced relatively soon, around age 2 or even earlier, and with no mistake of misplacement, as mentioned, by typically developing children. Thus, the late appearance of complement clitics can be taken as a sign of language delay, indeed as a marker of SLI at age 5 and 7 (Bortolini et al. 2006; Arosio, Branchini, Barbieri & Guasti 2014 for Italian; Paradis et al. 2003 also in bilinguals with SLI/BISLI). Interestingly, although clitics appear late, the special position that they have to fill is not problematic also in the atypical population. There appears to be a delay, possibly a long delay, but not a wrong morphosyntax of clitics in SLI. At least, from what is known up to the state of the research so far.

The chapter is organized as follows. Section 2 is dedicated to the acquisition of clitics in typical development; by looking at children's early productions, an omission stage has emerged in Italian (2.1), which has also been detected across Romance languages; results bearing on the related question of whether the unexpressed object should be considered an omitted clitic or a null-object of the type found in languages which allow for this option (e.g. European and Brazilian Portuguese) are presented in Section 2.2. Section 2.3 discusses results on the (early) acquisition of past participle agreement under cliticization, a process obligatorily occurring with third person object clitics in Italian. The acquisition of object clitics in bilinguals and child and adult L2 speakers is addressed in Section 3, whereas Section 4 is devoted to the acquisition of object clitics in atypical development: SLI, 4.1; cochlear implanted children, 4.2; children with developmental dyslexia, 4.3. Finally, Section 5 is dedicated to the analysis of the comprehension and the proper interpretation of structures containing object pronominal clitics by children from age 3, also in comparison with reflexive clitics. The last section concludes the chapter by summarizing the main results presented and indicating some elements for future research.

## 3.2    Clitics in L1 Italian

### 3.2.1    Clitic omission in early Italian productions

A characteristic and often used experimental procedure to elicit the production of an object clitic is creating a situation through a short story, possibly with the help of pictures or videos, in which character A does something to character/object B and then the experimenter asks the child a question of the following sort:

(5)    Che cosa fa/ha fatto A a/con B?
       What does/has done A to/with B?

Given the discourse pragmatics of the exchange, the expected answer must contain a pronoun corresponding to B; in a Romance language like Italian this pronoun must be a clitic, as illustrated in (6):

(6)    a.    Cosa fa/ha fatto il papà al bambino?        >>
             what does/has done the father to the child

       b.    Lo pettina/ha pettinato
             (he) him-cl combs/has combed

       c.    Cosa fa/ha fatto la ragazza con la mela        >>
             what does/has done the girl with the apple

       d.    La mangia/l'ha mangiata
             (she) it-cl eats/has eaten

By using an elicitation method of the type illustrated above, Schaeffer (2000) has reported clitic omission in early child Italian: 64% at age 2, 15% at age 3. Omission virtually disappears at age 4. As reported in various other subsequent works on Italian and as it is often the case in acquisition, omission is typically an optional phenomenon (e.g. Antelmi 1997; Cardinaletti & Starke 2000; Guasti 1993/94; Schaeffer 2000), i.e. it is not the case that clitics are never produced in the relevant conditions by children during the omission stage, rather it is a fact that they are often omitted, at the percentages reported above from Schaffer's work. Given the young age of the children in Schaeffer's study, it is clear that clitics are acquired very early on.

Leonini (2006a, b) reports data from spontaneous production of one child, showing very early spontaneous production of clitics at age 2 (29% in relevant contexts), which combines with a high omission rate at the same age (57% in relevant contexts; the remaining 14% were full lexical objects in contexts in which a clitic pronoun would have been preferred), comparable to the one found in the results from Schaeffer's elicited production. Interestingly, at earlier ages 1;10 and 1;11 there was omission in relevant contexts (50% and 75% respectively; the remaining produced object were lexical noun phrases), and no clitic in spontaneous production, suggesting an avoidance of the hard structure by the child. The ability to produce clitics in relevant contexts increased very rapidly in the child studied by Leonini (2006a, b): at age 2;8 the same

child had a high production of clitics (86% in relevant contexts) and very few omissions (11% in relevant contexts; 3% were full lexical objects in contexts in which a clitic pronoun would have been preferred).

This first overview suggests a number of conclusions: on the one hand object clitics are produced fairly early on in an appropriate way by children acquiring Italian, as evidenced by both the spontaneous and the elicited production data just reviewed; they are always correctly located, as all studies report; however, sometimes clitics are not produced in the relevant contexts in which they are expected, either in the situation created by the experimental design or in the natural contexts of spontaneous production. Hence, there is indeed a stage of clitic omission in Italian; around age 3–4 this stage is over.

Tedeschi (2009) has provided interesting controlled evidence that omission indeed concerns clitic pronouns and not lexical objects in general required by a transitive verb, by enriching the experimental design of the type originally formulated in Schaeffer (2000). She investigated (fifty-six) children from age 2;1 up to age 4;11; different scenes were proposed to the children in which two characters, e.g. a pig and a monkey, were present and one character, the pig, performed an action, e.g. combed, on the other one, the monkey. Two questions were then asked referring to the same scene: a generic one and a specific one, only in the latter a clitic was expected, as is illustrated in (7)a, b respectively:

(7)　a.　Q:　Cosa ha fatto il maialino?　　　　　A:　Ha pettinato la/una scimmia

　　　　　　　what has done the little pig?　　　　　　- has combed the/a monkey

　　　b.　Q:　Cosa ha fatto il maialino alla scimmia?　A:　L' ha pettinata

　　　　　　　what has done the little pig to the monkey?　　- it(cl) has combed

Tedeschi's results clearly show that omission only affects the specific answer, i.e. the answer eliciting a clitic pronoun. Overall, children have omitted the object lexical noun phrase in only 3.6% of the generic answers of the type in (7)a, and they have omitted the specific object, i.e. the clitic pronoun in 18.5% of the cases. The results clearly show a development in the omission rate, as is illustrated in Table 3.2.

The percentages of omission from a group of 10 adults acting as controls were 1.6% and 3.4% for the two types of answers. These results indicate very neatly that children omit pronominal object clitics; there are few omissions of lexical objects, from the early ages.[5] Interestingly, these results look very similar to Schaeffer's results referred to above and also to the results from spontaneous production reviewed from Leonini.

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5.　The 16.7% at age 2 corresponds to 3 omissions out of 18 relevant answers; the 59.1% corresponds to 13 omissions out of 22 relevant answers. Hence, from the youngest group the difference of the two cases is very sharp.

**Table 3.2.**  Percentages of clitic/complement omission according to the type of question (Number of children = 56, age range: 2;1–4;11) (from Tedeschi 2009)

| Answer to | 2 y.o. | 3y.o. | 4y.o. |
|---|---|---|---|
| Generic question (lexical DP omission) | 16.7% | 2.2% | 2.4% |
| Specific question (CL omission) | 59.1% | 14.3% | 11.8% |

I.e. in the early age span 2–3, clitic omission is at over fifty percent, it is attested around fifteen percent and less at age 3; it then essentially disappears.

A further interesting conclusion can be drawn from the results just reviewed. The fact that object omission predominantly concerns contexts eliciting a clitic pronoun, not only clearly suggests that the phenomenon is in fact clitic omission as noted, it also indicates that children master the discourse pragmatics of pronominal use fairly well, from very early on: there is indeed a virtual lack of object omission in contexts in which a lexical noun phrase is expected, as noted. A similar conclusion can be drawn from the corpus study in Serratrice, Sorace and Paoli (2004) in which omission/zero objects occurred in the production of six monolingual Italian speaking children (from the CHILDES database), age-range 1;7–2;11, exclusively in contexts in which a clitic pronoun would have been expected. As Tedeschi explicitly points out, this type of consideration sheds doubts on Schaeffer's (2000) interpretation according to which the omission stage could derive from an inadequate mastery of the pragmatics of the discourse situation, so that children would omit for lack of distinction between the shared or unshared knowledge of the speaker and the hearer. In contrast, it seems that children know when a pronoun or a lexical noun phrase should be used, but some-times, especially in the youngest ages, they fail to produce the relevant pronominal clitic form.

A complement of these considerations comes from the observation that children at ages 3 and 4 from the described experiment by Tedeschi (2009) very rarely supplied a lexical noun phrase in the contexts eliciting a clitic (0% at age 3; 2.6% at age 4, i.e. 2 cases out of 76 elicited). They did use a lexical noun phrase in the same conditions at a higher rate at age 2 instead (27.3%, i.e. 6 cases out of 22 elicited), which is the age in which omission is also at its peak, as noted (59.1%, i.e. 13 cases out of 22 elicited). This further indicates a general difficulty in the mastery of clitics, whose production is located at 13.6% (i.e. 3 cases out of 22 elicited), at age 2.[6] Production of clitics in

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6.    Sometimes the different groups of children produced a clitic in the conditions eliciting a full noun phrase. The results are rather incoherent in Tedeschi's experiment in this respect showing no age correlation (16.7% at age 2; 8.7% at age 3; 48.8% at age 4). This seems to suggest that some

the relevant conditions of the type in (7)b, raises up to 85.7% at age 3 (i.e. 78 cases out of 91 elicited), and 85.5% at age 4 (i.e. 65 cases out of 76 elicited), thus showing a clear development as well as a clear relation with the sharp decrease of omission, mentioned above.

A further relevant fact should also be mentioned which shows up from all the studies mentioned so far, as well as from those yet to be mentioned in the following sections, also concerning different acquisition modes and different ages. As we have seen in the present section, in the conditions eliciting a clitic in Italian children may have difficulties in providing the correct production. They may typically omit the clitic at the young ages; at the youngest age, around 2 they may even sometimes produce a lexical noun phrase in contexts in which a clitic was rather expected, as noted. The crucial fact is that there is a production that children never appear to resort to: they do not use a strong pronoun in place of an elicited clitic.[7] This suggests that children know the different informational values that the different pronominal forms can carry from very early on indeed. Only strong pronouns can express a form of focalization; as mentioned in 1., they can be used to correct a preceding statement or disambiguate between two pronominal referents, but they cannot be used in the typical cases in which a pronoun is made use of, namely when reference is made to a referential noun phrase in the immediate discourse. The distinction appears to be very clear in young children acquiring Italian.[8]

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interfering factor may be responsible for the incoherent and unexpected behavior. Possibly, the fact that the design only contained two characters is one relevant factor: since one of the characters (the subject) is mentioned in the question (see example (7) above), children may sometimes assume that the only other remaining character is known to the speaker and can thus be realized as a pronoun, hence a clitic. Notice that, interestingly, this has also the effect of raising a bit the overall picture of children's ability to produce clitics at the different ages. Tedeschi briefly reports on a pilot study in which a third character was introduced in the story: the effect was a clear raise in the production of lexical noun phrases in the expected conditions, and a consequent clear decrease of production of (clitic) pronouns in the same contexts, thus suggesting that the experimental bias in the original task has probably been identified.

7.   This seems to be basically the case also in L2 acquisition. A robust fact, to which we shall return in Section 3. Note that frequency cannot be appealed to to explain lack of recourse to the strong pronoun, as from the elementary lexicon of Italian (Marconi et al. 1993) the strong pronoun *lui* is much more frequent (2942, position 48) not only than a clitic pronoun (e.g. *li*, 960, position 119) but also than a common noun like *cane*, "dog" (1350, position 96). Thus, if anything, frequency would lead to the opposite expectation.

8.   See also Serratrice (2007) for data showing appropriate use of clitics in Italian by school-age children with consequent unattested use of strong pronouns in the contexts in which a clitic would be the appropriate pronominal form.

### 3.2.2  Is the unexpressed object an omitted clitic or a null-object?

Consider the sentences in (6), repeated here as (8), with the difference that the expected answer does not contain a clitic pronoun:

(8)  a.  Cosa fa/ha fatto il papà al bambino?  >>
         what does/has done the father to the child?

     b.  *Pettina/ha pettinato
         (he) combs/has combed

     c.  Cosa fa/ha fatto la ragazza con la mela  >>
         what does/has done the girl with the apple?

     d.  *Mangia/ha mangiata/o[9]
         (she) eats/has eaten

As discussed in the preceding section, the answers in (8) b, d are totally ungrammatical in Italian; if children produce sentences of this type, these productions are considered typical instances of omitted clitics. The equivalent of sentences like (8)b, d, however, are perfectly grammatical in so called null-object languages. Chinese, for instance, is a language of this type (Huang 1984 and subsequent work). But we do not need to look for typologically very distant languages to find the availability of null-objects. Within the Romance family, a language like European Portuguese (EP) productively allows for null-objects.[10] The acquisition of null objects in EP has been studied in a number of works by Costa and Lobo, (Costa & Lobo 2007a, b) who have designed both production and comprehension experiments primarily capitalizing on the crucial condition governing the distribution of null-objects in adult EP: null-objects can be found in simple sentences equivalent to those in (8)b, d, but when complex sentences are considered, the distribution of null-objects is more constrained. Null-objects cannot be found inside islands, i.e. they cannot be found inside those subordinate clauses which are islands for extraction, typically adjunct clauses. Costa and Lobo's (2007a) utilized *because*-type clauses as in the exchange in (9); the impossibility of the answer in (9) with a null object contrasts with the well-formedness of (10), in which the null object is contained in a declarative embedded complement clause (Raposo 1986):

(9)  Q:  E a Maria?
         what about Maria

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9.  The example illustrates clitic omission independently of presence/absence of past participle agreement with the unexpressed clitic. The past participle agrees with the clitic obligatorily in Italian with third person clitics.

10.  Also French to some extent does, although in more limited conditions Tuller et al. (2011).

> A:   O Pedro está triste porque o Zé *(a) beijou.
>       the Pedro is sad because the Zé her$_{CL}$ kissed

(10)    A Maria disse que o João viu –

The exclusion of null-objects inside islands is a distributional property which should follow from principled reasons, as in Raposo's (1986) original account, and Huang's (1984) approach to the null object construction. In general terms, we can think of the null-object as a null pronominal variable element connected to a Topic referent in the nearby discourse, which provides the relevant interpretation/referent to the null category.[11] If movement is involved in the search of an antecedent for the null-object, the limitation for the null element to non-island contexts receives a direct account.[12] From the point of view of acquisition, it is an interesting research question to check whether the null-object option could be a generally available option in development. Is it the case that children allow for this option, at least in the early stages of acquisition, before determining that their language is not a null-object language, as in the case of Italian? One may speculate that the null object option may be somehow more economical, less costly for the immature computational system, so that young children might tend to explore it in early stages. If the language is a null-object language then the option is maintained; it is abandoned otherwise and an overt clitic pronoun is always supplied in the relevant conditions.[13] This would be the case for children acquiring Italian; if the language is a null-object language instead, children maintain the option and possibly even overextend the use of the computationally more economical option (Costa & Lobo 2007a and Footnote 12). Concentrating our attention on Italian, we now report

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**11.**    We do not develop in detail here the theoretical issue concerning the exact nature of the empty category in the described type of analysis. Assume for concreteness that it is a null pronominal variable, bound by a Topic noun phrase, which may be overt in the immediate superordinate clause or it may be null and its content is bound through discourse. See Huang (1984) for the original inspiration of this type of account; Belletti (2009, Chapter 11) for a recent revisitation of the issue.

**12.**    According to Costa and Lobo (2007a; see also the EP results in Varlokosta et al. 2011 cross-linguistic study on children at age 5) European Portuguese children overuse null-objects also inside islands. Presumably, this suggests that children can appeal to some other type of derivation than movement to interpret the null element. As a matter of fact, null-objects may not be a unique type of element. See the discussion in the text below on this issue.

**13.**    Note that one might expect that, all things being equal, the null-object option should also be entertained by children acquiring both a clitic and a non-clitic language. To the extent that omission is also attested in a language like English, as in the more recent findings reported in Perez-Leorux et al. (2008), in contrast to classical assumptions based on spontaneous production (cfr. Section 1), this could indeed be the case. See below for further discussion, and Perez-Leorux et al. for a different interpretation.

results from Brunetto (2009) in which the question has been raised in precisely the terms just described.[14]

Direct object clitics have been elicited through the elicitation design developed within the COST-A/33 project in three groups of (forty-three) children aged 3 to 6 under two conditions: a root condition, with sentences of the type in (7), and an island condition, with sentences of the type in (8). Pictures were shown to the children through a Power-point presentation, and the relevant question under the two conditions are illustrated in (11)a, b:

(11)  a.  Root.

Q:  Che cosa sta facendo il cane al gatto?
(*What is the dog doing to the cat?*)
Expected answer from the child:
…Lo lecca
((*it*) *licks him* = clitic)

b.  Island.

Q:  Il cane lecca il gatto e ora il gatto è contento. Perché il gatto è così contento? Il gatto è così contento…
(*The dog is licking the cat and now the cat is happy. Why is the cat so happy? The cat is so happy….*)
Expected answer from the child:
….perché il cane lo lecca
(*because the dog licks him* = clitic)

The ratio clitic production/clitic omission is illustrated in Table 3.3.

Clearly, the amount of omission in island contexts is about half of what it is in root contexts. This is an interesting result in two respects: i. it suggests that some cases of omission are indeed likely to be analysable as cases of null-objects of the EP type, which are not possible inside islands; ii. there is a residue of omission at all ages, although rather limited (especially so inside the island) in the older groups of 4 and 5. As Brunetto points out, a crucial developmental leap occurs at age 3;5. Clitic omission

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14.  Gruter (2007) has reported experimental results from French indicating that French (and English) speaking children (mean age 4;4 and 4;6) do not accept a null object in sentences referring to a situation depicting an action on a specific object. The author concludes that the null object option is not equally entertained by children in comprehension as it appears to be in production; the difficulty in production is then interpreted in terms of processing limitations of memory working space, leading to omission. Mateu (2014) for similar conclusions based on Spanish data (from early L2 children with Spanish as dominant language). More results and other experimental designs directly comparing production and comprehension in homogenous groups of children are needed before drawing general conclusions on a principled distinction between grammar and processing, as defended in the quoted works. In the lack of comparable evidence from Italian the issue is left open here as it is beyond the scope of the present discussion.

Table 3.3. Percentages of clitic production (+CL)/clitic omission (−CL) according to the syntactic context, root or island, by 3 groups of children (total number of children: 43) (adapted from Brunetto 2009)

| Context | 3 y.o | | 4 y.o | | 5 y.o | |
|---|---|---|---|---|---|---|
| | +CL | −CL | +CL | −CL | +CL | −CL |
| Root | 71.82% | 15.87% | 88.77% | 5.1% | 87.01% | 4.54% |
| Island | 79.32% | 8.64% | 91.83% | 3.57% | 91.78% | 2.85% |

dramatically decreases at this age in both root and island contexts; omission is instead very low and rather stable at the ages 4 and 5. Table 3.4 summarizes the results, splitting the 3 y.o group in two, thus highlighting the crucial developmental point (the data of the 4 and 5 y.o children are those of Table 3.3, repeated for convenience).

Table 3.4. Percentages clitic omissions, splitting data from the 3-year-olds in two to show the crucial developmental point (adapted from Brunetto 2009)

| Context | 3–3;5 y.o | 3;5–4 y.o | 4 y.o | 5 y.o |
|---|---|---|---|---|
| | −CL | −CL | −CL | −CL |
| Root | 22.61% | 12.5% | 5.1% | 4.54% |
| Island | 15.71% | 6.12% | 3.57% | 2.85% |

If the grammatical constraint on movement is the main factor determining the decrease of null objects inside the island context, still omission is not completely absent in both root contexts and island contexts at all ages. The residual presence of object omission, especially inside the island in which it should be excluded on principled grounds, strongly suggests that the null object option is not a unitary phenomenon, always involving movement for the search of an antecedent. Let us further explore this possibility. The majority of residual null objects in Brunetto's data corresponds to those experimental items in which an inanimate (pronominal clitic) object was elicited, at all ages. Within the omitted objects the distribution w.r.t. animacy is illustrated in Table 3.5:

Table 3.5. Percentage of omitted (clitic) objects according to animacy (adapted from Brunetto 2009)

| Context | 3 y.o | | 4 y.o | | 5 y.o | |
|---|---|---|---|---|---|---|
| | inanimate | animate | inanimate | animate | inanimate | animate |
| Root | 31.48% | 11.61% | 9.52% | 3.89% | 12.12% | 2.47% |
| Island | 17.54% | 6.69% | 4.76% | 3.24% | 5% | 2.27% |

The omitted object corresponds to an inanimate object at a rate of almost three times or more that in which it would correspond to an animate object. And the omission with the inanimate object remains not-negligible also at the older ages. This suggests that the inanimate object may be prone to a different analysis by the child. Possibly, it could be analyzed as an elliptical specific object whose antecedent is mentioned in the immediate discourse context, an option which may be available universally as witnessed by the fact that some languages do exploit it. Brazilian Portuguese (BP) is a language of this type, in which specific null objects are generally widespread, much more so than in EP (Lopes & Cyrino 2005). Crucially, in BP, when they are inanimate, (specific) objects are practically always null. If the availability of specific (inanimate) null objects is a universal option, it is not surprising that children entertain it for a while also in a language like Italian, which does not adopt this option in the adult language. Moreover, as the case of BP indicates, it is also not surprising that the option be maximally exploited with inanimate objects, as they are those more prone to be null. The results above suggest that this could count as a suitable interpretation for the relatively long residual appearance of some omissions in child Italian, under the proposed experimental conditions.[15]

In conclusion, the question we raised at the beginning of this section seems to have an articulated answer along the following lines: up until age 3,5 Italian children seem to be in the omission stage, at a rate comparable to the one reported in the studies previously presented in Section 2.1. The fact that the younger children omit up to 15.71% in the island context suggests, on the one hand, within Costa and Lobo's experimental rationale, that the zero object in these cases is not a null object of the EP type. On the other hand, the fact that children of the same age omit much more, up to 22.61% in root contexts (hence: 7% more), suggests that children in these cases are most likely exploiting the null-object option that languages like EP also allow in the adult grammar. Finally, the fact that there is a residue of omission also in the older age groups in both contexts, suggests that the zero/null/unrealized object may not

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**15.**   Perez Leoux et al. (2008) suggest that the relatively high number of omissions in early English that they found in their experiments could be analyzed as an extension by children to specific contexts of the intransitive/non specific object reading that many transitive verbs allow. Cfr. use of "He is eating – " in a context in which "He is eating it" would be appropriate. In their development, children should learn to limit this option to non-specific generic contexts, as in the adult language. However, the type of omission that BP allows for extensively and the results on Italian just reviewed on children of the older groups, who by that time should have set the correct option for omission of generic objects only, suggest that animacy of the object is likely to play a crucial role as well. That children exploit a grammatical option widely adopted in some languages, as hinted at in the text, sounds like a very plausible way to interpret the residual omission of child Italian. Possibly, also the extended omission stage of EP reported by Costa and Lobo mentioned in Footnote 12, could be amenable to a similar account.

be a unitary phenomenon: UG seems to also make null objects available in a more widespread way, typically inanimate, following a path witnessed by the case of BP in contrast with EP. Italian children appear to entertain this hypothesis for some time.[16]

Before concluding this section, further consideration is in order on the status of transitive sentences in which the object is left unexpressed. It may be that in some cases some type of intransitive interpretation of the verb of the sentence makes the sentence plausibly acceptable even in a non-null-object language. Consider a situation in which there is a child and a cake and the child is eating the cake; if in this situation we then ask the classical elicitation question "what is the child doing with the cake?", an answer like "he is eating" may not be totally inappropriate/unacceptable. It could amount to an interpretation like: "he is doing the action of eating". Let us refer to this type of interpretation as the intransitive interpretation. It cannot be excluded that some cases of object omissions/zero objects in the productions described in this and in the preceding section may be related to the availability of his type of interpretation. Some circumstantial evidence that this may be the case can be indirectly provided by some results from Tedeschi (2009) which we now briefly review in concluding this section. Tedeschi set up a comprehension experiment in order to check the acceptance of null objects by Italian children and adults. The experiment was a truth value judgment task. It was designed in such a way that, after showing a number of scenes, the experimenter asked to a Puppet the question:

(12)    "Cosa è successo al pesce?/What happened to the fish?"

and the Puppet answered:

(13)    "Gino non ha pescato!/Gino has not caught!"

with no expressed object. The question referred to a preceding story in which Gino did catch something, a frog also present in the scenes, but did not catch the fish of the story. In this situation the sentence "Gino non ha pescato!/Gino has not caught!" should be considered false, since Gino did catch something (the frog), although he did not catch the fish. Interestingly, in this experiment both children (age: 3;4–4;11)

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**16.**    See also Müller, Schmitz, Cantone, Kupish (2006) for a related idea that the omissions in the Italian children productions could be in part of the BP type. According to these authors the omission rate of object clitic pronouns is higher in the productions by Italian children than it is in the productions by French children, the two groups of children studied in their work. The authors entertain the idea that the zero object may in fact be of a different type in the two languages. Without entering into the exact implementation of their proposal, the fundamental insight that the zero object option may correspond to different types of objects and computations in different languages and hence, possibly, in different developmental stages in different languages shares some resemblance with the considerations in the text. See also Müller & Hulk (2001) for partly different conclusions on related data from bilinguals.

and adults reacted in a very similar way; children accepted the sentence with no expressed object up to 37.5% of the cases; adults accepted it up to 30% of the cases. A natural way to interpret the adults' reaction may be along the lines described above in terms of a particular instantiation of the intransitive interpretation in the following terms: to the extent that the action of fishing amounts to catching fishes, it can indeed be the case that in the depicted story the sentence *Gino non ha pescato* be considered true as Gino has not caught any fish (but a frog). In most of the cases of Tedeschi's experiment the sentence with the unexpressed object may be judged possible under some version of the intransitive interpretation, in which a certain action is/is not performed. Both children and adults appear to have access to the intransitive interpretation.[17] We may then conclude this section by noting that some cases of unexpressed/null/omitted object in production may correspond to cases deriving from an intransitive interpretation of the eliciting question that the experimenter proposes to the child or to the adult.

In conclusion, a precise picture of the zero/unexpressed/omitted object is difficult to offer as several conditions need to be controlled for at the same time, something which is not always possible to do on the basis of the available data. Nevertheless, a clitic omission stage appears to be confirmed by all studies reviewed in this and the preceding section, for direct object clitics, though the characterization of the unexpressed object may not be uniform. The following schema summarizes the possible nature of an unexpressed object, based on the considerations developed and the results reviewed in the present section:

Unexpressed object:   i.   omitted clitic
ii.   null object of the EP kind (>*inside islands)
iii.  null object of the BP kind (> more widespread, specially with inanimate objects)
iv.   "intransitive interpretation"

We now move in the following section to the discussion of another phenomenon interacting with the acquisition of clitics and the omission stage: past participle agreement.

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**17.**   According to Perez-Leroux et al. (2008) English children of mean age 4;10 accept null objects in comparable experimental conditions to those set up by Tedeschi (2009) up to 60%. These results contrast with the generally assumed conclusion from corpus studies that object omission is rarely found in early English (see also Footnote 13). However, it cannot be excluded that the experimental setting may have lead to a slight overestimation of the phenomenon. This is suggested by the very different results obtained by Tedeschi (2009) described in the text with children of the same age range in Italian. If anything, in a clitic language in which clitic omission is a generally attested phenomenon the omissions should be expected to occur more than in English.

### 3.2.3 Italian clitics and past participle agreement

A salient feature of the morphosyntax of direct object clitics in Italian is that, in periphrastic tenses, they trigger obligatory past participle agreement in the third person, as (14) illustrates:

(14) a. (La ragazza/il ragazzo) L'ho incontrat**a/o** davanti al cinema
(The girl/the boy) (I) CL-have met/$_{Agr\ fem,\ sing/masc,\ sing}$ in front of the movie theater

b. (Le ragazze/i ragazzi) Le/li ho incontrat**e/i** davanti al cinema
(The girl/the boy) (I) CL-have met/$_{Agr\ fem,\ pl/masc,\ pl}$ in front of the movie theatre

Assuming the derivation of cliticization in (3) of the introduction, past participle agreement may reflect the early step of the derivation in which the clitic moves as phrase (DP) and passes through the specifier of a functional head hosting the past participle (Belletti 2006; Kayne 1989; Friedeman & Siloni 1997).

The occurrence of past participle agreement under cliticization is a natural phenomenon to check in acquisition. The topic has become even more relevant from a theoretical point of view, since the proposal has been put forth based on Wexler's (1998) Unique Checking Constraint hypothesis that there may be a correlation between the occurrence of past participle agreement under cliticization and the occurrence of clitic omission, in the clitic omission stage described in the preceding sections. The proposal is especially endorsed by Gavarró, Torrens and Wexler (2010). According to these authors, a clitic omission stage should only be expected in languages which have past participle agreement under cliticization: in these languages the child would be forced to violate the Unique Checking Constraint which constrains his/her immature computational system since two feature checking operations should take place under cliticization. One feature checking would correspond to the checking of a specificity (D) feature, i.e the clitic itself (or clitic voice, under the assumed analysis for cliticization inspired by Sportiche 1996) and the other would correspond to the checking of the past participle agreement features (Agr). The first checking operation would correspond to the phrasal part of the cliticization process assumed in (3) in the introduction; the second to the last step of the derivation, involving movement of the clitic as a head. Under Wexler's approach, only one step of the movement for feature checking can be properly performed by young children. The capacity to perform more steps under the same computation matures in development. The Unique Checking Constraint is complemented by a further constraint, Minimize Violations. A complementary prediction of the approach defended by Wexler et al. is that in the case of past participle agreement under cliticization, the young child has two possible ways out to produce an output: either one in which the clitic is omitted or one in which the clitic is realized

but no past participle agreement is implemented. Although the fact that clitic omission is instantiated in a language like Italian (based on Schaeffer's results reported above) has been taken by the authors as an illustration of the explicative power of the assumed approach, the results from a number of studies have shown that the picture is more complex and often incoherent with the described predictions of the Unique Checking Constraint + Minimize Violations approach described.[18] A natural possible expectation of the approach seems to be that the omission stage in periphrastic tenses could be, at least in part, characterized as follows: (i) if the clitic is produced, no past participle agreement is produced; (ii) if the clitic is omitted, past participle agreement is produced. However, the results obtained in two studies, which checked exactly this distribution, have shown that this possible prediction is not borne out. Both Hyams and Schaeffer (2007) and Moscati and Tedeschi (2009) have come to the following general conclusion: (i) if the clitic is produced, past participle agreement is generally produced as well by children; (ii) if the clitic is omitted/unrealized, past participle agreement is generally absent (or any way very rarely present) in children's productions. The two hypothetical expected outcomes illustrated in (15) do not characterize the children's productions in the relevant conditions:

(15)   a.    (*) Li ho visto
               (I) CL-them$_{cl, masc, pl}$ have seen$_{pst\ prt,\ masc,\ sing/default}$
       b.    (*) Ho visti$_{pst\ prt,\ masc,\ pl}$

The occurrence/non occurrence of past participle agreement seems rather to correlate with the actual presence of the clitic. Indeed, as we concluded in the previous section, an unrealized object can correspond to different possible elements, in part to an omitted clitic, in part to a null object of the EP type (in the young ages), in part to a null typically inanimate object of the type widespread in BP, in part to a different natural interpretation that can be given to the experimental question, which we have referred to as the intransitive interpretation. On the one hand, it is not surprising that the relation between clitic omission and realization of past participle agreement is not as direct as the described approach implying that an unrealized object should solely correspond to an omitted clitic would make one expect. On the other hand, the experimental results from the two above mentioned studies interestingly indicate that past participle agreement under cliticization is indeed performed at a significant rate

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18.    Moreover, children acquiring languages which do not have past participle agreement under cliticization such as European Portuguese (Costa & Lobo 2007a, b) and Rumanian (Avram & Coene 2007), and also some varieties of Spanish (Fujino & Sano 2002)), have been shown to undergo a clitic omission stage as do children acquiring e.g. Italian (Schaeffer (2000) and the references reviewed above).

from early on by the children tested. We now review Hyams and Schaeffer (2007) and Moscati and Tedeschi's (2009) results in closer detail.

In Hyams and Schaeffer (2007) an analysis has been performed of children's productions from Schaeffer (2000). A complex tense involving Aux + past participle was elicited as a correction of a previous statement made by a Puppet which was such that a clitic was elicited as well. A relevant type of exchange is illustrated in (16) (Hyams & Schaeffer 2007, (6), 295):

(16)    Puppet:   Mamma Orsa ha picchiato le rane
        Child:      No, ha lavato! (M, 2;1)

The child's production in (16) can be interpreted as an instance of object clitic omission, given the discourse situation of the exchange. No past participle agreement is performed by the child. As it turns out, this is a fairly typical situation, contrasting minimally with presence of past participle agreement in the cases in which the clitic is also produced by the child. The figures are as follows:

**Table 3.6.** Number (and > percentages) of clitic omission/realization and Past Participle Agreement. From Hyams & Schaeffer (2007)

|                          | 2 y.o.   | 3 y.o.   | 4 y.o. | 5y.o. | Adults |
|--------------------------|----------|----------|--------|-------|--------|
| − CL + PstPart Agreement | 2 > 11%  | 1 > 0.2% | 0      | 0     | 0      |
| + CL + PstPartAgreement  | 8 > 44%  | 57 > 98% | 77     | 72    | 130    |
| + CL − PstPart Agreement | 0        | 0        | 0      | 0     | 0      |
| − CL − PstPart Agreement | 8 > 44%  | 0        | 0      | 0     | 0      |
| Total                    | 18       | 58       | 77     | 72    | 130    |

These results indicate very clearly that from the youngest age children correctly perform past participle agreement under cliticization, and that, when they are in the omission stage in the age 2–3, past participle agreement with the omitted/unrealized object clitic is virtually absent.[19] Children's productions in this respect are essentially adult-like from age 3.

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**19.**    The authors do not distinguish cases in which the past participle agrees with a masculine singular clitic, which could also be interpreted as use of the default agreement form of the past participle, from the other cases in which the clitic was either feminine or plural/masc, fem, hence clearly agreeing with the clitic. However, the results of the two studies are very neat and they are also confirmed by those in Moscati and Tedeschi (2009) to be discussed in the following paragraph in the text. These results contrast with those discussed in McKee and Emiliani (1992), which have not been replicated.

Comparable results have been obtained by Moscati and Tedeschi (2009) who have performed a similar analysis on the results obtained by Tedeschi in the experiment discussed in 2.2. The general figures are illustrated here below:

**Table 3.7.** Percentages of clitic omission/realization and Past Participle Agreement from Moscati & Tedeschi (2009)

|  | 2 y.o. | 3 y.o. | 4 y.o. |
|---|---|---|---|
| − CL + PstPart Agreement | 0 | 11.1% (1/9) | 20% (1/5) |
| + CL + PstPartAgreement | 25% (1/4) | 80.5% (33/41) | 75.9% (60/79) |

Again, these results confirm that children are very good from early on in performing past participle agreement with the clitic and that whenever the clitic is absent, the past participle virtually never carries agreement features corresponding to the unrealized clitic.

We conclude this section by pointing out that the ability that children show from the earliest ages to perform past participle agreement under cliticization is consistent with the well known findings from Guasti (1993/4, see also Chapter 1) which have clearly shown a good mastery of the verbal inflectional morphology by the young Italian children whose corpora of spontaneous production have been analyzed. The peculiar past participle agreement taking place under cliticization does not seem to be exceptional; its obligatory occurrence does not appear to add much to the complexity of the cliticization process, which may very well be hard to compute in the youngest ages, but not as far as past participle agreement is specifically concerned.

### 3.3    Clitics in L2: Bilingual/Child L2 Italian and Adult L2 Italian

The acquisition of Italian object clitics has been studied also in populations for which Italian is a second language, either in a simultaneous bilingual setting or in an L2 setting, both child and adult L2. Let us first review some results from the adult L2 population and then move to consider L2/bilingual children. In Leonini and Belletti (2004) 26 adult L2 speakers of Italian from different L1s, age range 19–34 y.o. have been investigated.[20] A production experiment with short videos was utilized in order to elicit the production of a direct object clitic; at the end of each video a question was asked of the

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**20.**   L1s: 16 L1 German, 3 L1 French, 2 L1 Polish, 1 L1 Dutch, 1 L1 Russian, 1 L1 Greek, 1 L1 Albanian and 1 L1 Bosnian.

familiar type. E.g. in a video showing a boy in the act of tearing up a piece of paper, the question in (17)a was asked at the end of the video and the expected answer was the one indicated in (17)b. Results are summarized in Table 3.8.

(17)  a.  Il ragazzo cosa fa con il foglio?
          The boy what is he doing with the paper

      b.  Lo strappa
          it(cl)-tears up/*he is tearing it up*

**Table 3.8.** Percentages of clitics realization/omission and of lexical noun phrases in L2 adults (N = 26, age range: 19–34 years) and L1 controls (adapted from Leonini & Belletti 2004)

|             | +CL  | −CL  | Lex noun phrase |
|-------------|------|------|-----------------|
| L2 adults   | 39%  | 14%  | 40%             |
| L1 controls | 91%  | 0    | 7.7%            |

The general picture with the tested L2 speakers of Italian – whose level ranged from initial to very advanced/near native – was that whenever clitics were not produced in the experimental conditions in which they were expected, they were either just omitted (i.e. no object was present), or else a lexical noun phrase was utilized in place of a clitic pronoun. As some (eight) L2 speakers, who were overall more advanced in their L2, did not omit any clitic in their productions, Leonini and Belletti (2004) have divided the L2 speakers according to whether they did or did not omit the clitic (i.e. some vs no omission). Interestingly, those L2 speakers who had zero omissions, supplied clitics in 64% of the cases and a lexical noun phrase in 30% of the cases; those L2 speakers who had some omissions supplied a clitic in 28% of the cases, omitted the clitic in 20% of the cases and produced a lexical noun phrase in place of a clitic in 45% of the cases. These results clearly indicate that lack of omission not only correlates with an increase in clitic production, but also correlates with a clear decrease in the production of a lexical noun phrase complement in place of a clitic. If we then consider the fact that the L1-Italian speakers in the control group only produced 7.7% of lexical noun phrase complements in the same experimental conditions, it seems natural to conclude that resort to use of a lexical noun phrase complement in the experimental condition constituted in fact a way to avoid the production of a clitic pronoun (i.e. it was not an experimental bias). The individual results confirm this conclusion: in all cases in which the omission was zero or anyway low, lexical noun phrases were also either produced at very low rate or they were never produced, similarly to the results in the group of control.

In her doctoral dissertation, Leonini (2006a, b) carried out the same production experiment with twenty L1-German/L2-Italian speakers, whom she divided in

three groups according to their level of attainment in the L2 (Intermediate-Advanced, determined through a standardized proficiency test-Near native, determined on the basis of length of exposure to Italian and every day use of the L2). She has obtained results that consistently give the same picture as in the previous running of the experiment just reviewed. Overall, the clitic was supplied in 28% of the cases, omitted in 14% of the cases, and a lexical noun phrase was produced in 52% of the cases.[21] Guasti, Maggioni & Vernice (2012) have obtained comparable results with early L2 children at age 5, with a variety of Arabic as their L1, who had regularly been exposed to Italian since age 3 (see also Taeschner & Devescovi 1987 for further comparison).

An interesting result, shared by the various studies, is that use of a strong pronoun has been extremely low in the adopted experimental conditions: a strong pronoun was supplied in only 1.7% of the cases in the first study, and in 3% of the cases in the second. Note that the latter result is very closely comparable to the results from the studies in L1 acquisition reviewed in Section 2.1. This indicates that also for the L2 adult speakers, much as for the L1 children, it was clear that the pronoun to be used in their answers should not be a strong pronoun. This was either due to the fact that its antecedent in some of the videos was inanimate, hence in principle incompatible with a strong pronoun which is always animate (Cardinaletti & Starke 1999); or else it was due to the fact that the pragmatic conditions of the experimental situation of the videos clearly excluded in principle use of a strong pronoun. Use of a strong pronoun, as mentioned in Section 1, requires some special discourse conditions, typically a form of focalization; this may be considered possibly a universal property, in particular (at least) in languages that make the distinction strong vs weak and/or clitic.[22]

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21. There is development, as Leonini notes, and as is reported in i. below:

    i.  a.  Intermediate:  2% clitic supplied,  19% clitic omitted,  69% lexical noun phrase
        b.  Advanced:  29%  16%  49%
        c.  Near native:  61%  5%  32%

22. The observed limited recourse to strong pronouns is interesting also in light of the results in Schmitz and Müller (2008). These authors report that in their first spontaneous productions Italian (and French) monolingual children initially use more strong pronouns than object clitic pronouns, and also more lexical objects than pronominal objects. The same conclusion is reached from the study of the productions by the two young German-Italian bilingual children (Carlotta 1;8,28–3;0,25. Lukas 1;7,12–3; 1, 16) also reported; hence, in Schmitz & Müller study strong object pronouns appeared earlier than object clitic pronouns in bilingual children, similarly to what is reported for monolinguals. We may then conclude that these results from mainly spontaneous production data reported in Schmitz and Müller (2008) suggest that in both monolingual and bilingual children strong pronouns must be somewhat easier than object clitics, as they appear earlier in development. Interestingly, however, although "easier", the results reported in the text clearly indicate that they are not a substitute for clitics.

In contrast, the ample recourse to use of a lexical noun phrase in the conditions in which a clitic pronoun was expected is not a result common to those reported from L1 acquisition: recall that in the results from the experimental studies reviewed, young monolingual children tended to omit the clitic (/produce a null object; see the discussion in 2.2), but they did not produce many lexical noun phrase complements in place of a clitic. This is an interesting difference, which distinguishes the two acquisition modes rather clearly, at least as for adult L2 acquisition of Italian, compared to monolingual acquisition of Italian.

It is now interesting to also bring into the picture the results from Ferrari (2006), where the spontaneous productions of two German/Italian bilingual children, Vincenzo (2;5–3;0) and Elisa (2;10–3;5) have been analyzed:[23] the main finding of this study in both children was an overuse of lexical complements in contexts in which a clitic would have been more appropriate. Vincenzo supplied clitics in 57% of the cases, omitted clitics in 9% and used lexical complements in 34% of the cases; Elisa supplied clitics in 59% of the cases, omitted clitics in 12% and supplied lexical complements in 29% of the cases. Results are summarized in Table 3.9.

**Table 3.9.**  Percentages of clitic realization/omission and of lexical noun phrases in two bilingual children (adapted from Ferrari 2006)

|  | +CL | −CL | Lex noun phrase |
| --- | --- | --- | --- |
| Vincenzo | 57% | 9% | 34% |
| Elisa | 59% | 12% | 29% |

We may then note a larger use of lexical complements as the most distinctive feature in the productions of these young bilingual children (34% and 29% respectively), compared to the productions of the monolingual ones from the experimental study reviewed in Section 2.1. by Schaeffer (2000), Tedeschi (2009). These results are, however, more directly comparable with those from Leonini reviewed in Section 2.1, which were also spontaneous production data. At age 2;8 (roughly corresponding to the age at the beginning of data taking of Ferrari's corpora), the clitic production rate of the Italian monolingual child studied by Leonini already reached 86%, omission was at 11%, and production of a lexical complement in contexts in which a clitic would have been preferred only reached 3%. In Leonini's monolingual child and also in the

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23.    As Ferrari notes, Elisa may be better classified as a very early L2er since she had been inserted in a bilingual context after age 2 (before that age the context was monolingual Italian), whereas Vincenzo has been inserted in a German-Italian bilingual context from birth. The development of the two children is nevertheless very similar in this area of morphosyntax.

two German/Italian bilingual children from Ferrari's study, use of a strong pronouns does not appear to be an alternative to use of a clitic (despite their early appearance, according to Schmitz and Müller 2008 data on both monolingual Italian and bilingual German-Italian children; Footnote 22 for more on this). This result is also confirmed by the analysis of Serratrice, Sorace and Paoli (2004) of a long longitudinal corpus from a bilingual English-Italian child (age range 1;10–4;6); in the overall corpus the authors have documented only one instance of potential spontaneous use of a strong pronoun in a context in which a clitic would have been favored; such use is then virtually absent in all data reported so far.

Although the omission/zero object rate is comparable in the spontaneous production of the monolingual and bilingual children of both Ferrari and Leonini studies (around 10% in average), the bilingual children tended to resort to the use of lexical noun phrase complements at a much higher rate. This correlates with the fact that at comparable ages, the monolingual Italian child had a clearly richer supply of object clitics than the bilingual German-Italian children. On the basis of these data, a reasonable conclusion seems to be that overuse of a lexical noun phrase in contexts in which a clitic would be more appropriate may be a measure of the difficulty experienced in the production of object clitics.

The bilingual children resorted to a zero/null/omitted object to a similar extent as monolinguals. However, lexical noun phrases were exploited more. It seems natural that a zero/null/omitted object should not be overused in any population, be it monolingual or bilingual: a missing argument is either a deviant structure, or anyway an option which is not productively admitted in the target Italian language, as discussed in 2.2. As for the overproduction of a lexical noun phrase complement in the context in which a clitic would be more appropriate, to the extent that it indirectly reveals a difficulty with cliticization, it opens up the following residual question: why should cliticization in Italian be somehow harder in the child bilingual setting than it appears to be in the monolingual one? Furthermore, as noted, as use of a lexical noun phrase is also exploited in adult L2 Italian in contexts in which a clitic is expected, the question may extend to the L2 type of bilingual setting more generally.

Note first of all that in most of the studies reviewed in this section, the other language next to Italian was either German, or anyway a language that does not have clitics of the Italian/Romance type.[24] It is tempting to consider this as a crucial factor.

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24.   With the exception of the three (non-advanced) L1 French speakers of the study in Leonini and Belletti (2004). Two of them supplied clitics at the high rates of 70% and 74%; the third one had a peculiar behavior and supplied clitics only at a rate of 9%; not surprisingly, this speaker had a very large production of lexical noun phrase complements, up to 83%, in contrast to 30% and 9% of the others. Omission was absent in two speakers, and it reached 13% in one. Abstracting away from the peculiar behavior of the one French speaker with very high production of lexical

Let us concentrate on some relevant properties of German and Italian. Whereas German has both weak and strong pronouns but no clitics of the Italian/Romance type, Italian has clitics and strong pronouns (and a few weak pronouns, Footnote 1). It seems natural that in the acquisition of a second language or in an early bilingual setting a crucial step in the acquisition process be represented by the determination of the nature – strong, weak, clititic – and of the morphosyntax of the pronouns in the two grammatical systems involved – e.g.: size and occurrence of the syntactic movement implemented with each particular class of pronouns, their internal structure and so on –. Thus, in the course of the bilingual/L2 acquisition, a natural intermediate solution, in the temporary indeterminacy, may be found in simply avoiding the production of a clitic pronoun due to its special and complex morphosyntax, yet to be properly determined. However, the discourse pragmatic awareness in both adults and children from their young ages appears to be very solid and it excludes in principle use of a strong pronoun in place of the (weaker) clitic form in the relevant contexts; as mentioned in various occasions (also Footnote 26), strong pronouns are generally not a substitute for a clitic in both L1 and bilingual/L2 acquisition, at least as far as production is concerned. Hence, the alternatives left are either omission or production of a lexical noun phrase. As noted, omission is rather stable in the L2 different populations, young and adults, ranging between 9% and 20% at the very most. The zero object alternative, however, gives rise to the production of an ungrammatical sentence in Italian, in the relevant conditions (whence, the feeling of omission). The remaining alternative is the production of a grammatical sentence: this alternative corresponds to use of a lexical noun phrase complement. In the bilinguals studied and even more so in the L2 speakers, resort to this grammatical option is fairly often exploited (52% and 40% in the adult L2 speakers of the reported experiments; 34% and 29% in the spontaneous productions of the two bilinguals).

Serratrice, Sorace, Filiaci and Baldo (2012) have tested experimentally the accuracy in the interpretation of clitic vs strong pronouns in English-Italian bilingual children in the age ranges 6–7 and 8–10 (compared to English-Spanish bilinguals and Italian and English monolinguals, both children and adults). Much as for German, English pronouns belong to the strong and (possibly) to the weak class (same form of the pronoun in both cases). An interesting feature of Serratrice et al.'s results was that the English-Italian bilingual children, and especially those living in the UK (of the

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noun phrase complements (who should count as an outlier also compared to the average suppliance of the overall L2 group of 26 speakers), the behavior of the two L1 French speakers in their L2 Italian, clearly suggests that presence of clitics of the same kind in the L1 may help in their L2 acquisition. However, the L2 acquisition of object clitics is not smooth even in these conditions, as also these two speakers did produce lexical objects in the eliciting conditions, and one of them even had some omissions.

younger group in particular) were less accurate than the Italian monolinguals and accepted use of a strong pronoun in the pragmatic situation ([−focus] context in the authors' terminology vs [+focus] context which would favor preference for a strong pronoun) in which a clitic would have been appropriate in much higher proportions, 35% vs 19% younger group; 20% vs 9% in the older group. The authors considered different variables such as age, task, number of languages, and language of the community, which showed a number of interactions. In the context of the above discussion dedicated to elicited or spontaneous production, one should emphasize that the apparent difference in production on the one side, and accuracy in interpretation on the other, that these results may reveal (at least for the relevant English-Italian population of bilingual children considered) is in fact not minimal. In the case of the judgment of accuracy of interpretation required in the Serratrice et al.'s task the possible selection of a strong pronoun appeared to compete with a clitic pronoun, whereas in the elicited or spontaneous productions tasks reviewed the selection of the proper pronominal form was completely left to the speakers' decision. The presentation of the strong pronoun as a possible competitor may have somewhat affected the way the speakers accessed the interpretation. We leave open (but keep in mind its potential theoretical and descriptive interest) a closer comparison between the production results discussed in this section and the interpretation results in Serratrice et al. as a number of rather crucial interfering factors make a strict comparison not really possible given the different material utilized.

A final observation should be made before concluding this section: Leonini and Belletti (2004) have explicitly observed in their work that no placement errors occurred when a clitic was in fact supplied in Italian by the adult L2 speakers of the elicitation experiment. Furthermore, no placement errors have been reported in the productions of the two bilinguals in Ferrari's spontaneous corpora; nor placement errors with cliticization have been documented in the spontaneous production of other bilingual/ L2 population in Italian, in the available literature (e.g Müller et al. 2006; Leonini's 2006 corpora; same as Guasti's 1993/4 results on monolinguals). In all cases clitics, when produced, have always been located in the correct position, as proclitic onto the inflected verb or tensed auxiliary, as required in Italian (see introduction).[25] Certainly

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**25.** One misplacement is signalled in Ferrari (2006) in contexts involving a modal and an infinitive for which the two bilingual children produced the impossible *Mod Cl Vinf ", e.g. *Vuoi lo mangiare*/You want it-cl eat (V); *Devi mangiare*/You must them eat (E): rate of 63% for Vincenzo and rate of 27% for Elisa, of the relevant contexts. Ferrari interprets this error as stemming from Verb syntax rather than from a misanalysis of the Italian clitic pronouns by the two children. This was specially suggested by the fact that no similar misplacement was documented in her corpora in contexts containing an aspectual auxiliary and a past participle (i.e. no *Aux Cl PPart). The question remains open.

more data from both elicited and spontaneous production are needed to verify the generality of this empirical conclusion in bilingual/L2 Italian. If confirmed, it should be noted that it contrasts with the findings from bilingual/L2 French in which, occasionally but systematically some placement errors in the positioning of clitics have been reported (Hulk 2000; White 1996; Grandfeldt & Schlyter 2004; Belletti & Hamann 2004; Hamann & Belletti 2006 for a review).[26]

The proper positioning of clitics has also been tested in the adult L2 population on structures involving so called (Object) Clitic Climbing. Bennati and Matteini (2006) have studied the positioning of the object clitic in different structures in which the clitic is not/may not be cliticized onto the lexical verb of which it is an argument, but is/can be rather in one of the following functional verbs:

(18)  i.   the aspectual auxiliary (climbing obligatory):
          (La porta) L'ha aperta
          (the door) it-fem-CL has opened-fem

     ii.   the causative verb "fare" (in the *faire par* causative structure; climbing obligatory):
          (Il compito) Lo fa correggere dalla mamma
          (The homework) it-CL makes check by the mom

     iii.  a restructuring motion verb (climbing optional):
          (il prosciutto) lo va a comprare dal salumiere/va a comprarlo dal salumiere
          (the ham) it-CL (he) goes to buy at the store/(he) goes to buy it-CL at the store

     iv.   a restructuring modal verb (climbing optional):
          (il vaso) lo deve dipingere/deve dipengerlo
          (the vase) it-CL (he) must paint/(he) must paint it-CL

In two studies the same material has been utilized: a written task eliciting the production of the relevant structures. The first study has analysed a population of advanced

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**26.** A contrast of great potential comparative interest. Hamann and Belletti (2006) have speculated that the misplacement errors that they have reviewed for early and adult L2 French could be due the occasional misanalysis of clitics as a weak pronouns and that this misanalysis may be favored by the ample presence of weak pronouns in French (i.e. the subject pronouns which are syntactic weak pronouns in Cardinaletti and Starke's 1999 sense). Lack of (or anyway smaller presence) weak pronouns in Italian could be at the source of the virtual lack of placement errors in the L2. This would suggest that grammatical properties of the L2 may influence L2 acquisition, not just property of the L1, or of the other language more generally as in the case of simultaneous bilinguals.

Schmitz and Müller (2008) have pointed out a possible further distinction between the two languages emerging in both monolingual and bilingual acquisition by children, i.e. the fact that Italian object clitics seem to appear earlier in Italian than in French. A further potentially interesting comparative issue, which we must leave open here.

L2 speakers (who had shown to have a consistent production of clitics) with L1 English (7), Spanish (5), German (7), the second study has analysed a population of near natives (screened under White & Genesee 1996 procedure) with English (8) and Spanish (8) as their L1. Results from the two experiments are very close: in the obligatory cases as i. in which the pronoun obligatorily cliticize onto the functional aspectual auxiliary L2 speakers have correctly located the clitic in virtually all cases up to 100%; also in the obligatory case in ii. the clitic is located on the causative verb at a very high rate, up to 100% in both the near native and the advanced groups (with some individual variations only in the latter group); climbing is performed also in cases iii. and iv., with a clear preference in the modal context in which it reaches 75% with the near native group; more variation is found in the case of motion verbs, in which both structures are produced by the L2 speakers essentially at the same rate in both groups of near natives (40% climbed vs 60% on the infinitival in the L1 English group; 38% climbed vs 62% on the infinitival in the L1 Spanish group). Hence, proper location of the clitic in Italian is a robust fact in the L2 population: variation occurs only in contexts in which it is allowed in the language, i.e. with so-called restructuring verbs. In this case, optional climbing is also available in standard Italian, to different extents in different varieties. Hence, the possibly different analysis allowed in structures containing a restructuring verb is an option which L2 speakers have access to, independently of their first language. Similarly, L2 speakers correctly cliticize the pronoun on the causative verb independently of the type of causative construction of their L1, close to the Romance/Italian one in Spanish, different in English.

## 3.4    Italian clitics in atypical development

### 3.4.1    Clitics in SLI: Clitics as markers of language impairment

In the preceding sections, we have determined that evidence from the existing literature is strong that object clitic pronouns are somewhat hard to acquire in Italian, much as they appear to be in other Romance languages with similar types of object clitics. We have determined that there is an omission stage in the early stages of acquisition which may be interpreted, at least in part, as a sign of the difficulty in the acquisition of object clitics. Such a difficulty is in turn most likely to be mainly due to the complexity of the morphosyntactic computation that the process of cliticization involves, and which is manifested in the first place by the peculiar distribution of clitic pronouns compared to the distribution of lexical noun phrase complements and also other type of pronouns such as strong pronouns (see the introduction). A different path of explanation has been proposed in a number of works by Leonard and collaborators. For instance, in Leonard (2014) and related work (e.g. Leonard & Bortolini 1998; Bortolini et al. 2002) the proposal has been put forth that the difficulty with object clitics could

be mainly prosodic in nature, and especially so for children with SLI, due to the phonological non-saliency of clitics and to a difficulty generally found with initial phonological weak elements (as a proclitic would be). However, that also other factors, such as the complex morphosyntax mentioned should be relevant and most likely crucial is indicated by the fact that, in contrast with object clitics, equally phonologically/prosodically non-salient and often homophonous elements such as definite determiners are more easily acquired by both typically developing children and by children with SLI matching for ages and MLUs. The comparison has been explicitly made by Pozzan (2006) for Italian, to be discussed below and, originally, by Jakubowicz et al. (1998) for French. Furthermore, also in the elicitation experiment presented in Bortolini et al. (2002), whereas articles were supplied in 42.2% of the cases by a group of children with SLI (age range 4–6), object clitics were supplied in only 26% of the cases by the same children. The discrepancy between articles and clitics was also found in Leonard, Bortolini, Caselli, McGregor and Sabbadini (1992), These authors studied the spontaneous production of a group of 15 children with SLI aged from 4;0 to 6;0 (Mean 5;0) and with an MLU ranging from 1.9 to 4.3. Although they found that articles were more problematic than plural morphemes on nouns, third person singular morphemes on verbs and gender agreement morphemes on adjectives, they also found that articles were less problematic than clitics (omission rate for articles 59% and for clitics 74%).

Despite the detected difficulties, however, in the preceding sections we have also seen that very young children acquiring Italian master the morphosyntax of object clitics and the discourse conditions of their appropriate use very early on. Around age 3 cliticization and its use is acquired by typically developing monolingual children; the bilingual and early L2 children studied may have a somewhat longer delay and wider overuse of lexical noun phrase complements in conditions in which a clitic would be preferred, but the process of cliticization and use of clitics are acquired relatively early in the bilingual condition as well. The difficulty posed by cliticization has also been seen in adult L2 populations. Thus, on the one side there is repeated evidence from different modes of acquisition pointing to the difficulty of the acquisition of object clitics, on the other hand there is robust evidence that this domain is acquired relatively early on in the acquisition process – though later than other domains, e.g. articles, verbal inflections etc. (Chapters 1 and 2) -, and, it is worth reminding, in a faultless manner, both as for the morphosyntactic distribution of clitics and their appropriate use in discourse.

Given all these results from different acquisition modes, it is natural that the mastering of clitics has also been considered from the point of view of atypical language development. In particular, the early acquisition of object clitics in monolingual typical language acquisition may provide a baseline against which a possibly problematic development can be detected: if clitics are not mastered well at the early age in which we know they are normally mastered, this can be taken as a sign of a delayed or

atypical language development. In this spirit, it has been proposed that the late acquisition of clitics can be considered a marker of language impairment at age 5 and 7, to be expected in children with SLI. In the search for early potential markers, clitics qualify as a most privileged domain.[27] Work by Jakubowicz et al. (1998), Hamann et al. (2003) and more recently Tuller et al. (2011) have highlighted the relevance of delay in the mastering of object clitics, and in particular of third person object clitics as a measure of atypical development in French.

Bortolini et al. (2006) have reached similar conclusions for the delay in the acquisition of object clitics in Italian. Their study has tested 33 monolingual children divided in three groups: 11 children – age range 3;7 to 5;6 – had been diagnosed as language impaired and met the criteria for SLI (under the screening test for Italian in Cossu 1987); 11 children were typically developing (TD) children matching in age – age range 3;7 to 5;5; 11 children were younger TD children matching in MLU – age range 2;10 to 4;0. The test was a sentence completion task aiming at eliciting third person direct object clitics. Two drawings were shown to the child; for each pair of drawings the experimenter said, e.g.: *Qui la bambina compra il gelato* (here the girl buys the ice-cream), *e qui…*(and here…); the child was supposed to complete the sentence with the target sentence containing a direct object clitic: (*qui*) *lo mangia* (here she it(cl)-eats). The statistical analysis of the results has shown very clearly that the group of children with SLI was significantly less likely to produce clitics in the obligatory contexts of the type illustrated (supplied in only 19% of cases), than the TD MLU match group of children; the latter group, in turn, was significantly less likely to produce a clitic in the same conditions than the older TD age match group of children. Given the young age of the TD MLU match group, these results indicate a significant delay in the capacity to produce an object clitic by the SLI group. Note that the only error type produced by all children when a clitic was not supplied, was an omission error. The younger control group of the children tested in this experiment (age range 2;10 to 4;0) was precisely in the age in which omissions/zero objects are still present in the TD children's elicited productions, but are decreasing (to be expected especially in the 4 y.o older children), as had also been shown in the previous studies on the typically developing population reviewed in 2.1. Thus, these results clearly indicate the delay in the SLI group

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27.   Paradis, Crago and Genesee (2003) reach a similar conclusion for SLI French-English simultaneous bilinguals, BISLI. By analyzing the spontaneous productions of a BISLI group (age 7;3, MLU matched with 3;3 y.o. typically developing mono and bilingual children) the authors have shown that object clitics were supplied at a lower rate in French than pronouns were supplied in English. This confirms that there is a special difficulty with clitics, which does not extend to pronouns in general; thus, as the authors have properly underscored, the problem is likely to be located in the clitic nature of the pronouns and does not reveal a difficulty in establishing pronominal anaphoric relations in general.

whose children are older in age. In a recent experiment by Leonard and Dispaldro (2013) the capacity to supply an object clitic has been tested in SLI children at the age of 5 in unprimed and primed conditions. The results have indicated that coherently with familiar findings clitics were largely omitted in the unprimed conditions (around 68%); in contrast, omissions by the SLI children were significantly lower in the primed condition (around 30%). However, clitics were often supplied incorrectly as to their morphosyntactic features of gender and number.

In a elicitation experiment, similar to the one described above for Bortolini et al. Pozzan (2006) investigated the production of object clitics by a group of 4 Italian speaking children diagnosed as SLI, aged 7–11 (mean age 9), and compared it with two groups of TD controls: one group matching for age and vocabulary, and the other matching for syntactic abilities, whose mean age was 4;6. As expected, the performance of the SLI group was significantly lower than that of both control groups: SLI 50% correct object clitics supplied vs 99.5% in the age matched group of control and 80% in the younger control group matched for syntactic abilities.[28] Pozzan's study also compared the ability to produce a clitic with that of producing a definite article, also under elicitation. The interest in performing this comparison is the phonological similarity, in many cases identity, of clitics and definite determiners in Italian (and other Romance languages as well): whereas the production of clitics was quite low in the SLI group compared to that of both groups of control, as just discussed, definite articles were supplied at ceiling by the SLI children (102/108 cases), similarly to what was already the case in the younger group of control (146/150), matched for syntactic abilities.[29]

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**28.**   The incorrect productions were 42/84; among them, 26 corresponded to omissions, the remaining 16 were gender errors in which the clitic supplied was a masculine clitic in place of the expected feminine one. In no case the gender error went in the opposite direction. Further study is needed to confirm this interesting type of error.

**29.**   Object clitics: *lo*masc, sing, *la*fem, sing, *le*fem, pl, *li*masc, pl. Definite article: *il/lo*masc, sing, *la*fem, sing, *le*fem, pl, *i*masc, pl. For a first comparison between object clitics and definite determiners see also Bottari, Cipriani, Chilosi, Pfanner (1998), where the comparison took into account data from spontaneous production of 11 Italian children with SLI (age range 4;2–10;7. Mean age 6;3). We have reported here results from elicited production as they appear to be better controlled than spontaneous production data in the evaluation of the appropriate supply of clitics in the appropriate discourse conditions. The low supply of definite articles by the SLI children analysed in Bottari et al. (1998) in contrast with the ceiling performance of the children studied in Pozzan (2006) may be due both to the different method utilized in the two studies – spontaneous production (Bottari et al.) vs elicited production (Pozzan) – and to the different age of the children – younger in Bottari et al.'s study (mean age 6;3), older in Pozzan's study (mean age 9).

Some items of Pozzan's experiment also tested the production of reflexive clitic "si". The SLI did not perform much better with reflexives in Pozzan's data (18/32 correct vs 14/32 incorrect), in

As also pointed out in Bortolini et al. (2006), the difficulty in supplying clitics in obligatory contexts, although fairly characteristic in children with SLI, cannot be directly taken as a specific signature of the SLI syndrome. More properly and in more general terms, such a difficulty could qualify as a feature which characteristically affects language in pathological situations. As is well known, the SLI syndrome is characterized by the manifestation of forms of delay which specifically concern language development, in situations in which other cognitive capacities are preserved, score in the average, and no other declared concomitant pathologies are present; this is precisely the sense in which the impairment can be said to be "specific" to language in SLI. However, difficulty in supplying clitics in obligatory contexts is also frequently found in other populations affected by various types of pathologies. One case in point is provided for instance by a group of Italian speaking young adults and adolescents with Down syndrome, studied by Contemori (2011), in which a clitic elicitation procedure with video clips was utilized. Tuller et al. (2011) also reached similar conclusions on the production of third person object clitics in French by three groups of atypical populations, SLI, mild to moderate hearing impaired adolescents and adolescents affected by Rolandic Epilepsy.[30] It seems thus fair to conclude that difficulty in supplying (third person) object clitics in the relevant contexts can be considered primarily as an indirect sign of the linguistic complexity implied by the morphosyntactic computation of the cliticization process.[31] It can be claimed that the delay in the acquisition of cliticization can then count as a general marker of language impairment, which is certainly to be expected in SLI, but which can also be found in syndromes in which complex computations may be hard to perform for a variety of reasons, not all of them language specific reasons. Thus, a weaker conclusion can be reached on the basis of the above considerations: difficulty and delay in the computation of object clitics in the relevant young ages discussed, can indeed be considered a possible relatively early marker of SLI only in as much as other recognized concomitant pathologies are not present.

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contrast to both groups of control, where reflexives were supplied at ceiling. This result is however not confirmed by Arosio et al. (2010, 2014), in which the group of SLI tested had an almost ceiling performance with reflexive clitics in contrast with their low score with object clitics; this latter result converges with similar data on French SLI children studied in Jakubowicz et al. (1998). It is then possible that this aspect of the results in Pozzan's study may have been affected by other factors (such as recourse to different verbs not requiring a clitic etc., as discussed in the article), not by a specific problem with reflexive clitics. An open question.

**30.** All three groups investigated by Tuller et al. (2011) were characterized by the fact that their general cognitive development was unimpaired, but exposure to language had been atypical in childhood, though for different reasons, due to the different nature of the pathologies involved.

**31.** See also Bottari, Cipriani and Chilosi (2000) for a similar conclusion on the analysis of the productions of the SLI child studied in their work.

Arosio et al.'s (2010, 2014) study considered a group of sixteen SLI Italian speaking children of a closer age range as those of Pozzan's study 6;4–8;7, on their ability to produce object clitics by utilizing an elicitation procedure of the familiar type: two drawings were presented to the child, one introducing two characters one performing an action on the other, and the second drawing asked the eliciting question, e.g. *Che cosa ha fatto il bambino alla farfalla?*/what did the child do to the butterfly?, target answer: *L'ha presa*/he has caught it. Again, a significant lower supply of the elicited clitic was found in the SLI group, compared to the two groups of control, matching for age and for language abilities (screening test: TCGB, Chilosi & Cipriani 2006). Arosio et al. (2010) also tested the ability of the SLI children to comprehend the meaning of quantifiers and their capacity to compute implicatures of one of them (i.e. the quantifier *some*; see Chapter 8, Section 5.8). The aim of combining the two tests was to determine whether the difficulty in supplying clitics was matched by a more general difficulty with semantic/pragmatic aspects expressed through language: in the case of clitics, the ability to compute the antecedent-pronoun relation, in the case of quantifier the ability to understand their value (for quantifiers such as *all, none, some*). Whereas, as noted, the children with SLI had problems with the production of object clitics, they did not differ in the proper understanding of the quantifiers. Thus, they did not manifest a general problem with semantic/pragmatic appropriateness, but a specific problem with the computation of cliticization. In this context, the authors have pointed out some difficulty in computing the implicature triggered by the quantifier *qualche* (some) in the SLI group; the same difficulty, however, was shared by the language match younger group of control, thus indicating a developmental delay in SLI. In contrast, the SLI children showed a behavior in partial contrast to the one found in Bortolini et al. (2006), but similar to that found in Pozzan (2006) study: whereas Bortolini et al. (2006) only found errors of omission in the contexts in which an object clitic was expected, both Arosio et al. (2010) and Pozzan (2006) found that next to omissions the SLI children often supplied a significant high number of lexical noun phrase complements in place of the expected clitic. Arosio et al. (2010, 2014) suggest that this difference could be related to the age difference of the SLI group in Bortolini et al. (2006) study and their own study; in the former study the children were younger than in the latter (3;7 to 5;6 vs 6;4–8;7); interestingly, also the SLI children in Pozzan's study were of an older age, 7–11, closer to that of the Arosio et al.'s study. Arosio et al.'s conjecture in this respect is that such overuse of a lexical noun phrase in the older group could be due to a better awareness that the lack of a direct object in the syntactic conditions of the experiment would lead to the production of an ungrammatical sentence. Hence, due to the difficulty in the computation of cliticization, the SLI children often tended to produce a sentence which did not contain the (discourse appropriate) direct object clitic, but which was a grammatical sentence nevertheless. We may note the similarity of this interpretation, with the hypothesis we have entertained in Section 3 for the

similar type of (discourse inappropriate) productions in the various L2 populations considered there.

We may also note, as a final remark, that Arosio et al.'s study effectively shows that the problem in the production of object clitics by the SLI group should not be qualified as a problem with discourse pragmatics, not only through the comparison with the ability in the understanding of quantifiers that the SLI group has shown hinted at above, but also through the consideration that all the SLI children did not manifest any problem in selecting the discourse appropriate use of a null pronominal subject in their answers to the eliciting question. Pronominal null subjects had been supplied at ceiling in 90.90% of the cases, perfectly fitting with the discourse conditions of the elicitation question in which the subject was present and hence counted as a discourse given topic, thus requiring a null subject in the answer. The computation and the discourse appropriate use of null subjects has never been described as problematic, neither in typically developing children from their youngest ages nor in atypical development. From a comparative perspective, this ability recalls the early appearance in development of (weak) subject clitics in French pointed out in 1. As known from Hamann et al. (1996), in typical development the appearance of object clitics in French is delayed compared to the very early appearance of subject weak pronouns, generally referred to as subject clitics (Prévost 2009 for overview and discussion). Note finally, that the ability to properly use null subjects in Italian and subject clitics in French also clearly shows that SLI children do not have special problems in the mastering of pronominal anaphora in general (for French SLI Chillier et. al. (2010), Hamann & Belletti (2006), Paradis et al. (2003) and the related considerations in Footnote 27).

### 3.4.2 Clitics in children with cochlear implant

In a recent study Guasti et al. (2014) have tested the production of object clitics in a population of hearing impaired children with cochlear implant (CI) and compared it with the results from the same tests in a population of normally hearing (NH) children matching for age. The novel finding of this study is that not only the production of clitics was problematic in the CI group of children, as expected given the general difficulty with clitics in different types of development, but also that this crucial domain of Italian morphosyntax was the only one among those tested in the study in which there was a clear effect of age of implantation.

Guasti et al. (2014) tested a group of 33 children with cochlear implant ranging in age from 50 to 82 months; they were all born deaf (with one single exception of a child who became deaf after meningitis at 11 months) and had all followed a rehabilitation program both before and after surgery. The children had been implanted early, between 12 and 56 months of age; the length of the implant thus varied between 23 and 60 months. No child in the tested population had used LIS (Italian Sign Language)

in the family, neither before nor after implantation. The clitic task consisted in a version of the familiar elicitation procedure. A picture was presented to the child on a computer screen and a pre-recorded voice said a sentence like, e.g.: "In this picture there are a frog and a fly"; then, a second picture appeared and the voice said "Here the frog has eaten the fly. Can you tell the puppet what the frog did to the fly?". The child was expected to react with a sentence like the following (19).

(19)    (La rana) l'ha mangiata
        the frog it-CL Femm has eaten Femm

There were 8 situations aiming at eliciting sentences like (19) with a compound tense, and 8 similar sentences with a simple present tense as in, e.g. "(La rana) la mangia" (The frog it-CL Femm eats). As summarized in the following Table 3.10, CI children produced fewer correct responses than NH children and the latter group was overall more accurate than the former. Moreover, the error most frequently produced by CI children was the omission of the clitic:

Table 3.10. Frequency, means and SD of sentences with clitics, omissions, noun phrases in normally hearing children and in children with cochlear implant (N = 33 for each group, age range: 50–82 months) (adapted from Guasti et al. 2014)

|  | Normally hearing children | | | Children with cochlear implant | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Frequency** | **Mean** | **SD** | **Frequency** | **Mean** | **SD** |
| Clitic | 420 | 12.72 | 2.71 | 301 | 9.12 | 5.23 |
| Omission | 22 | 0.72 | 0.87 | 112 | 3.39 | 3.32 |
| Noun Phrase | 68 | 0.13 | 0.33 | 62 | 1.87 | 2.16 |
| Other | 18 | 0.60 | 1.61 | 53 | 1.60 | 2.06 |
| Total | 528 | | | 528 | | |

The authors point out that CI children produced the same raw number of clitics as the NH 3 y.o children studied in Schaeffer (2000). Their production was however adequate when age of exposure to the language was taken into account, as the children had started to be exposed with two years of delay. Hence, CI children were two years behind NH children. Similarly, the correct production of past participle agreement under cliticization was produced at a frequency rate matching that of the 3 y.o children studied in Moscati and Tedeschi (2009); as the younger NH children, the CI children in these cases used the default form of the participle, corresponding to the masculine -o ending (instead of -a; i.e. for sentence i.: *L'ha mangiato*). A further original novel contribution of this study consists in providing (the beginning of) an answer to the general question whether age of implantation should be considered a

predictor of the quality of linguistic abilities of CI speakers. The authors have shown that CI children tested had a slower but equivalent pattern of development as NH children in three independent standardized tests (TCGB, PPVT, Nonword repetition task) as well as in the (new) clitic production test described and also in a Comprehension test of Gricean conversational maxims. However, it is only with the clitic task that a further significant effect of age of implantation has shown up in the performance of CI children: the sooner the implant had been fitted, the better their performance in the clitic elicitation task. This result is of general relevance for the central question of whether age of implantation matters: the results show that it does in a selective way, depending on linguistic properties of the language under consideration. In Italian, age of implantation matters in the morphosyntactic domain of cliticization, but not in the same significant way in the other linguistic domains tested, such as in particular Italian phonology (as measured by Nonword repetition), or conversational abilities analysed through the compliance with Gricean maxims in Italian (see Chapter 8); in the latter two cases and also in the other standardized tests (TCGB, PPVT), CI and NH children showed a similar developmental behavior. Together with the conclusion of the previous section on clitics as possible markers of SLI, this result also provides the crucial piece of information that possible problems in the mastery of clitic pronouns in CI children at around age 4, should not be directly interpreted as a potential warning of language delay; age of implantation should be considered first, as it introduces a significant dimension of variation in the development of this population.

### 3.4.3   Clitics in children with Developmental Dyslexia

In the aim of disentangling SLI from Developmental Dyslexia (DD) and thus contributing to a more precise characterization of the two disorders, which may coexist or be independent in different individuals, Guasti (2013) tested the oral language of a group of twenty-four Italian-speaking children diagnosed with DD with a mean age of 9;2; a group of twenty-four subjects matched for chronological age (CA) served as control. The DD children were administered a test aiming at assessing their phonological reading abilities through the reading of a small number of non–words (Vernice et al. 2013). 51% of the children with DD fell 1.5 SD below the mean of the CA matched controls, coherently with the idea that DD is characteristically a phonological disorder.[32] The oral language abilities of the DD group were tested through the elicitation of object clitics under the same design described in the preceding section (Arosio et al. 2010). Overall, the DD group produced fewer clitics than the CA matched controls. However,

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**32.**   But see Friedmann & Castles (2013) for a more complex general picture of dyslexia, which may manifest itself in ways also partly dependent on the morphological properties of and the ortographic system adopted in a given language (e.g. Hebrew and English).

as Guasti (2013) crucially observes (see also Guasti et al. to appear) the most relevant analysis is the individual one: some of the DD children performed very well in the elicitation task, producing clitics at the same rate as the CA matched controls, whereas others performed poorly, producing the elicited clitics in only 20% of the cases The individual analysis showed that 25% of the DD children fell 1.5 SD below the mean of the CA group of controls. Hence, this smaller group of DD children performed in a way comparable to that of the SLI groups, described in the previous section, in which the ability to supply clitics in the eliciting conditions was still quite low after age 5, up to age 7 and, possibly, also later. The results of this study contribute to a novel approach to the way in which the linguistic deficit could be assessed: also the oral language should be investigated in children referred to for dyslexia (a practice that is not common in Italy). In particular, they should be investigated for those areas of morphosyntax which are not only known to be hard across populations, but which also qualify as possible clinical markers of a specific language deficit such as SLI. The area of cliticization is especially relevant in this respect. Thus, the question opens up whether the children with DD who have performed poorly with the production of clitics were in fact children affected by SLI who had not been diagnosed until school age. Alternatively, this group of children with DD may also have non-phonological deficits that may be at the source of the problems they manifest in their oral language. These are crucial questions which are opened by this type of study and which point to the need to take also the oral language of children with DD in relevant well-studied areas into close consideration, also in view of early rehabilitation programs. In a similar vein, Zachou et al. (2013) have investigated the oral productions of object clitics in children with DD with mean age of 9 as well as their ability to detect clitic omission through a grammaticality judgement task. The statistical analysis has indicated that a control group of children also tested (mean age 9;4) produced significantly more correct responses than the group of children with DD in the production task; the latter group produced a number of substitution errors and also some omissions were found; omissions were significantly poorly detected by the group with DD.

## 3.5    The comprehension of object clitics by monolingual children acquiring Italian

We have seen in the preceding sections that typically developing children in their rather young age (around 3–4) have a good mastery of object clitics. We have addressed the acquisition issue from mainly two points of view: the ability to produce object clitics; the ability to supply a clitic in discourse controlled appropriate conditions. In the latter perspective, we have noted several times in passing that, whenever children produce clitics, they do so in a discourse appropriate way. In particular, their use is adult like

from this point of view from very early on. Children have shown sensitivity to the discourse value of clitics, so that a clitic must refer to an antecedent mentioned in the previous discourse; characteristically, in the elicitation designs considered, the antecedent was mentioned in the eliciting story. Hence, children appear to be sensitive from early on to the discourse anaphoric value of clitics. It is then natural to ask the following question: do children also have an overall adequate comprehension of object clitics? More specifically: Are children able to associate the correct referent for a clitic on the basis of the morphosyntactic features of gender and number carried by the clitic? Are children able to properly compute the assignment of the appropriate antecedent for an object clitic?

The first question was addressed in Orsolini et al. (1994) for the gender feature. Children of 4, 5 and 6 y.o. were tested on their ability to select the correct referent for a clitic solely on the basis of the gender expressed by third person singular masculine and feminine clitics *lo* and *la*. Children were told (illustrated) stories describing situations in which two possible referents, one masculine and one feminine, were present; they had to choose to which one of the two possible referents the clitic present in the story referred. The authors found that when other pragmatic factors were involved (e.g. high topicality of the relevant referent) the youngest 4 year-olds performed well, showing a good understanding of the referent for the clitic; however, when no other plausibility factors were involved and the grammatical gender carried by the clitic was in fact the only discriminating factor, young 4 y.o. children performed poorly, at about chance. In contrast, the older children from age 5, performed significantly better selecting the correct referent in 72% of the cases. Thus, these results indicate that, as far as the morphosyntactic gender feature is concerned, children appear to be able to properly exploit it in the selection of the appropriate referent for the clitic pronoun not earlier than age 5. No comparable results are so far available in which the number feature is similarly manipulated.

The second question raised above mainly amounts to asking whether children acquiring Italian properly master the formal universal binding principle which regulates the choice of an antecedent for a pronoun present in a given sentence. In terms of the frame introduced since Chomsky (1981), the question amounts to asking whether children acquiring Italian master principle B of the binding module of their internal grammar, when a pronominal clitic is involved. In its essentials, principle B of the binding module is a principle of non-coreference (Lasnik 1989), requiring a personal pronoun to be *free* – i.e non-coreferent with a potential antecedent – in a given syntactic domain. C-command is the relevant structural notion determining potential antecedents: a c-commanding noun phrase is a potential antecedent for a pronoun. Thus, given the non-coreference requirement of principle B, in a sentence like (20) a following the clitic pronoun *lo* cannot take the c-commanding subject *il bambino* as its antecedent; in contrast, *il bambino* can be the antecedent for the clitic pronoun

in (20)b as the principle is satisfied in the embedded interrogative, the relevant binding domain in which the pronoun is free (of course it does not have to, as the antecedent could always be picked up in discourse):

(20)  a.  Il bambino lo ha riconosciuto (nella foto)
          The child has recognized him (in the picture)

      b.  Il bambino non sa se la mamma lo ha riconosciuto
          The child does not know whether the mom has recognized him

The paradigm in (20) represents the core of the binding paradigm for pronouns (see Chapter 8, Section 4 for a discussion of principle C of the binding theory). The clitic or non-clitic nature of the pronoun should not matter for the UG principle to operate properly. Indeed, this is precisely the intuitive impression that one has in the natural interaction with children, who seem to master well the distinction in the attribution of possible antecedents to pronouns in contrast to anaphors: if the antecedent of the anaphoric expression in (20)a were to be selected in *il bambino*, the appropriate anaphoric expression to use would have been the reflexive (also a clitic) *si* as in the following (21):

(21)  Il bambino si è riconosciuto (nella foto)
      The child has recognized himself (in the picture)

The relevant binding principle A regulating the interpretation of reflexive anaphors requires the anaphor to be *bound*, i.e. it must have a c-commanding antecedent in the relevant domain, in this case the sentence containing the anaphor, in contrast to personal pronouns.

This acquisition issue has been explicitly addressed experimentally in McKee (1992), whose main results we now review. A group of 30 Italian speaking children,[33] age range 3;7–5;5 were tested on their ability to properly comprehend the appropriate antecedent for both 3rd person pronominal clitics (direct objects)[34] and anaphoric clitics. The task was a truth value judgment task using a procedure well adapted for children (Crain & Thornton (1998)): the child has to say whether the situation described by a puppet is true or not, in the latter case the sentence is false. For instance, use of a sentence of the type in (20)a to describe a reflexive event of the type in (21) should be judged false; the opposite situation in which (20)a describes an event in which the antecedent of the pronoun is picked up in the discourse context outside the simple clause should be judged as true. The sentences utilized to test principle B are those in (22), and include both simple and complex clauses: in the simple sentences the antecedent for the clitic pronoun should be picked up from the context of the introductory

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33.  All from the same geographical area to avoid interfering factors.

34.  There is one indirect object in McKee's material as in (22)d. Results are not affected by this.

story presented to the child and could not be the noun phrase subject of the same clause; in complex sentences, the antecedent of the pronoun could be the noun phrase present in the other clause not containing the pronoun, an adverbial clause in McKee's material:

(22)   *One clause sentences:*
    a.   Lo gnomo lo lava
        the gnomo him washes

    b.   Il cavallo lo spoglia
        the horse him undresses

    c.   Gianni lo asciuga
        Gianni him dries

    d.   Maria le ha fatto male
        Maria her has done bad

(23)   *Two clause sentences:*
    a.   Mentre la gnoma era sdraiata, la puffetta la copriva
        while the gnoma was laid down, the smurfette her covered

    b.   Mentre il maiale dormiva, il cavallo lo guardava
        while the pig slept, the horse him looked

    c.   Dopo che la mucca saltellò, la rana la grattò
        after that the cow jumped, the frog her scratched

The results have clearly shown that children, at the tested age range, were very good in correctly interpreting the experimental items, hence in correctly selecting the antecedent for the pronoun (there was no age effect, younger children were as good as older children). Half of the experimental items required a *no* answer and half a *yes* answer, depending on the introductory story; in the case of simple sentences, the correct antecedent was not present in the sentence, and should have been picked up from the extra-clausal context. In average, children responded correctly in 90% of the cases. More specifically, children responded correctly (*no*) in 85% of the cases in simple sentences of the type in (22) (with the introductory sentence describing a picture with a *gnomo* washing himself), thus ruling out the possibility of picking up the c-commanding subject of the same clause as a possible antecedent for the pronoun; they responded correctly (*yes*) in 97% of the cases in simple sentences of the type in (22) when the antecedent had to be picked up from context, and was thus extra-clausal (one character presented in the introductory story). Children responded correctly (*no*) in 80% of the cases and (*yes*) 97% of the cases in complex sentences of the type in (23). These results are summarized in Table 3.11:

    Children were thus all very good in providing the correct interpretation; they over-accepted a bit in some of the cases in which the (impossible) antecedent was present in the same sentence; this group result however, as McKee (1992) discusses,

**Table 3.11.**  Percentages of children's correct responses (N = 30, age range 3;7–5;5) (from McKee 1992)

|                    | NO answer | YES answer |
|--------------------|-----------|------------|
| Simple sentences   | 85%       | 97%        |
| Complex sentences  | 80%       | 97%        |

was due to the performance of five children. By removing these five children, the overall results reach up to 96% of correct responses. There was no significant difference between simple and complex sentences for which the correct response was given in 91% and 89% of the cases respectively. Thus, it can be concluded that around age 4, children comprehend the binding properties of pronominal clitics very well, in general at ceiling, at a very high rate anyway.

McKee also tested the same group of children with respect to their ability to comprehend sentences containing the reflexive clitic *si*. The material used was exactly the same as in (22) and (23), with reflexive *si* in place of the 3rd person clitic. Overall children provided the correct answers in 95% of the cases, thus showing that they have a very good comprehension of the reflexive clitic anaphors. Taken together these results indicate neatly and in a carefully controlled experimental setting, that Italian-speaking children around age 4 have a very good comprehension of both pronominal and reflexive clitics. This type of results thus fits well with the productions results reviewed in the previous sections.

McKee (1992) also adapted the same experimental material in English with (sixty) English speaking children aged 2;6–5; 3. In the English material, of course, both the pronouns and the reflexive anaphors were not clitic in the Italian/Romance sense, since English is not a clitic language. Whereas the children's performance was at ceiling with the comprehension of sentences containing a reflexive anaphor (himself/herself), it was rather low in the comprehension of sentences with full pronouns (him/her). In particular, children sometimes incorrectly accepted sentences describing a situation in which the antecedent of the pronoun were the c-commanding subject of the same clause containing the pronoun, thus incorrectly over-accepting sentences requiring a *no* answer. We have just seen that the Italian-speaking children did not show any special difficulty with the same type of material in which the test sentences contained a clitic pronoun. Thus, this type of result, which has come to be known as a "delay of principle B" effect (DPBE) in languages of the English type, points to a difference in the comprehension of the same type of binding relations by children of comparable ages, which depends crucially on the nature of the pronoun in the language they are acquiring, clitic – as in Italian – or full (strong/weak) – as in English. Furthermore, since the English-speaking children did not show problems with comprehension of the reflexive anaphors (himself/herself) in the same experiment, this type of results

singled out a special difficulty with pronouns and not a general difficulty with the establishment of binding relations.

Work on DPBE, also referred to as the Pronoun Interpretation Problem (Brunetto 2012) has received a lot of attention in the acquisition literature, crosslinguistically (Hamann 2011, for an overview of the general literature on the acquisition of pronouns in a cross-linguistic perspective). A detailed presentation would take the discussion in this chapter too far afield. We just provide here some ingredients of this long lasting debate – without doing justice to its complex possible theoretical implications (see Hamann 2011 quoted and the items cited therein) – by bringing into the picture some recent experimental results on the acquisition of the interpretation of clitic pronouns in Italian, presented in Brunetto (2012), whose main results we review in the remaining of this chapter.

Although clitics are generally exempt from DPBE/PIP, one major notable exception exists, first documented for Spanish by Baauw et al. (1997) (see also Hamann et al. 1997 for French, and Jakubowicz 1989 for a first experimental study on related structures): the interpretation of a pronoun in so-called ECM structures, notably the small clause verbal complement of perception verbs, is also problematic in a clitic language like Spanish. Moreover that ECM type structures of this type are especially problematic, had also been documented for Dutch by Philip and Coopmans (1996). In (24) some of the relevant sentences tested for Spanish with an experimental TVJT design, which had also been utilized in the other languages tested:

(24)   Spanish:   a.   ¿ La niña la seca?
                          the girl her-CL dries?

           b.   ¿ La mama la ve bailar?
                 the mom her-CL sees dance?

Whereas young children correctly rejected coreference between the clitic and the subject in the simple sentence (24) a in 90% of the cases, they (incorrectly) rejected it to a much lower extent in the ECM context, 64% of the cases.[35] Thus, ECM contexts appear to have some special status.

Assume that the fundamental difference in the way in which coreference can be established is informally described as follows: it can occur either through accidental coindexing between a referential noun phrase (the antecedent) and the pronoun (referred to as accidental coreference); or through binding, the formal relation requiring c-command of the pronoun by the antecedent referential noun phrase. Since the

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**35.**   In non-clitic languages like Dutch also the simple case is problematic as a classical instance of DPBE; however the difference between the two syntactic contexts emerges also in this language with the coreference between the matrix subject and the pronoun in the ECM rejected in only 10% of the cases (and in 36% in the case of simple sentences, Philip & Coopmans 1996).

first studies on DPBE/PIP, the conclusion has been reached that children experience difficulties in implementing the non-coreference requirement on pronouns only when the potential antecedent is a referential noun phrase ((25)a, Chien & Wexler 1990), but they do not have any difficulty in the interpretation of sentences in which the antecedent is non-referential as in the case in which it is a quantifier/operator ((25)b, Chien & Wexler 1990). In the latter case, the coreferent interpretation of the pronoun could only be obtained through binding, i.e. through c-command by the operator/quantifier over the pronoun (Grodzinsky & Reinhart 1993):[36]

(25)  a.  Is Mama Bear touching her?
      b.  Is every bear touching her?

Results from several experiments have consistently shown that children have no difficulty in rejecting the bound interpretation of the pronoun in sentences of the type in (25)b (Thornton & Wexler 1999). Hence, (even young) children appear to have problems in mastering accidental coreference, but no problem in the mastery of the formal structural condition on binding. Let us take at face value this crucial conclusion of the rich debate on DPBE/PIP. On the basis of this conclusion based on children's interpretation of sentences containing clitic and non-clitic personal pronouns, one can claim that clitics are less prone to admit accidental coreference within the relevant binding domain than full (strong/weak) pronouns; rather, clitics are interpreted structurally, through a binding configuration. The debate on the reason why it should be so is still open and cannot be adequately addressed here. Be it as it may, the conclusion above may provide a line of interpretation for the reason why there should be a difference in the DPBE/PIP in languages with clitics in contrast to languages without clitics: binding of the clitic is excluded in the relevant binding domain by the requirement of principle B that pronouns are *free*, i.e. non-coreferent. Children know the relevant structural c-command requirement on the assignment of reference, whence their correct assignment of reference is always in compliance with principle B. Notice that cross-linguistically, children do not experience any difficulty in the interpretation of reflexives, independently of their clitic or non-clitic status. This robust cross-linguistic result is coherent with the conclusion just reached: reflexives are anaphors, hence they need to be bound under structural c-command (in the relevant binding domain; principle A of classical Binding theory, Chomsky 1981), a condition that children master well.

Children's performance in Spanish cases like (24) b remains as a substantive residue, though: why should children have problems with non-coreference when a clitic is

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**36.**  See Conroy et al. (2009) for a different view on the asymmetry operator-quantifier/referential noun phrase.

involved in an ECM structure? The combination of the nature of the structure and of the cliticization process should be at the source of this difficulty. Precisely this question is raised by Brunetto (2012) for Italian; furthermore, Brunetto has also extended the empirical investigation to another reduced verbal complement possibly structurally similar in some relevant respect to the (small clause) complement of perception verbs, i.e. the so called causative *faire par* construction.[37] The experiment was an act out task run with three groups of 74 children aged 3 to 5. The sentences tested in the two types of structures are illustrated in (26)a and (26)b for ECM/Perception verb complement and the *faire par* construction:

(26)  a.  La giraffa la vede saltare la staccionata
           the giraffe her-CL sees jump the fence

      b.  Papà lo fa abbracciare dalla scimmia
           dad him-CL makes hug by the monkey

The results are summarized in Table 3.12: comprehension is mostly below chance in the various age groups in both contexts.

**Table 3.12.**  Percentages of correct interpretation of clitics in ECM/Perception verbs and *Faire par* structures by three groups of children (N = 74, age range: 3–5 years) (adapted from Brunetto 2012)

|  | 3 y.o. | 4 y.o. | 5 y.o. |
| --- | --- | --- | --- |
| ECM/Perception verbs | 45% | 42% | 59% |
| *Faire par* | 47% | 58% | 60% |

The same structures have also been tested with reflexive clitics, and the results are sharply different with correct comprehension ranging from 72% (*faire par* in the youngest group) up to 98%. Hence, the problem solely concerns pronominal clitics. In line with the insight discussed according to which coreference may be brought about either through accidental coreference or through binding under c-command, the interpretation of the results can run along the following lines, adapting and somewhat simplifying Brunetto's proposal. The account is phrased in terms of phase theory and its essential lines are the following: assume that the reduced verbal complement of the ECM and *faire par* structure is a vP (in fact, a defective vP in the sense of Chomsky 2001). This vP is the domain within which binding has to obtain. Since clitics move

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**37.**  Also Restructuring structures and Control structures are analyzed in Brunetto's experiment. We limit the discussion to ECM/Perception verbs complements and the verbal complement in *faire par* where results are sharp and robust.

and have to exit the vP phase (through its edge position), there is no referential c-commanding noun phrase within the vP which could bind the clitic (and its trace) and which the clitic (and its trace) should be non-coreferent with.[38] This has the consequence that, in order to resolve reference of the clitic, the possibility of accidental coreference opens up for the child at the next clausal phase at the clause level, whence possible coreference between the subject and the clitic in the two types of structures in (26) may occur. Details aside, the crucial ingredients of this type of account capitalize on the nature of the verbal complement shared (in the relevant aspects) by perception verbs and *faire par* structures and the movement nature of cliticization. In simple clauses, there never arises a situation in which the clitic (trace) is left unbound within the vP phase due to presence of the external argument which would count as a possible antecedent; whence non-coreference obtains already at this stage and there is no comprehension problem in simple clauses, with either a referential subject noun phrase or a quantifier.[39]

## Summary and questions for future research

This chapter has addressed the acquisition of the production and comprehension of direct object clitics in Italian, a domain that turns out be relatively hard to acquire at initial stages of acquisition. As discussed in the introduction, clitics have a peculiar distribution as they have to fill a dedicated position in the clause structure where they attach to the verb; cliticization is thus a fairly complex derivational process. This is in fact an area of difficulty for all populations discussed in this chapter, to different degrees and with different characteristics. Typically developing children undergo an initial stage in which the object clitic is not always produced in contexts in which its presence would be most felicitous; this stage has been characterized as a clitic-omission

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**38.**    The subject of the clause is outside the vP phase in ECM. The external argument of the vP does not c-command the object clitic in the case of the *faire par* structure as it is anyhow internal to the PP headed by preposition *par*.

Some movement of pronouns must be admitted also in Dutch and other languages working in the same way, given the results referred to in Footnote 35 and the stronger effect in ECM structures also in this language.

**39.**    Adults do not allow for accidental coreference in sentences like those in (26). The assumption must be that the conditions for accidental corefernce are not satisfied, something that children have yet to acquire (along the lines of Chien & Wexler original account), and adults, differently from children, continue to comply with the non-coreference requirement of principle B in ECM and *faire par* structures also at the next phase, the clause. This is a crucial developmental question which needs to be addressed and which is still open.

stage, which in turn may not manifest itself uniformly in the different populations, as discussed. Relatively early, however, between age 3 and 4 typically developing children master the complex morphosyntax, and the interpretation of clitics well (residual difficulties may be found in few constructions due to their own peculiarities). SLI children instead manifest a prolonged stage of difficulty with cliticization since, as late as age 9, they do not supply clitics in the same way as their age matched controls. At younger ages, SLI children tend to omit clitics, at older ages they tend to produce a lexical noun phrase complement instead of the pragmatically more appropriate clitic. Since this has been shown not to be due to pragmatic inadequacy, the complexity of cliticization may again be responsible for this delayed non-target behavior. Mastery of clitics in Italian can then be recognized as a sensitive domain, in fact as a possible early marker of atypical development. Problems with the ability to produce clitics have also been found in the oral language of children with DD; however, not all the children with DD manifested this problem, thus suggesting that difficulty with cliticization is not a marker of dyslexia. DD children who have problems with cliticization may either be SLI children whose language problem had not be diagnosed during the preschool years or their problem may reflect different types of dyslexia, only for some of them cliticization may be a sensitive domain. Difficulty in supplying object clitics has also been found in the other atypical population of children with cochlear implant; the findings indicate that earlier age of implantation may play a role. In adult and child L2 cliticization is also a difficult domain; the tendency that speakers manifest is that of producing more lexical complements instead of the more appropriate clitic; the difficulty is also indirectly manifested in the scarcity of clitics in the spontaneous productions analysed. In bilinguals whose language combination is Italian and a Germanic language (German, Dutch, English), clitics are also not supplied at the same rate as the typically developing controls. A systematic finding in all populations studied, typical and atypical, and also including the L2 and bilingual populations is that never is the case that the clitic tends to be substituted with a strong pronoun. The amount of strong pronouns found in place of clitics is very marginal or virtually absent in all populations.

Although there is a substantial bulk of robust results on the acquisition of object clitics in different populations and acquisition modes, both as for their production and comprehension, a number of questions still either remain open or are opened by these very results and call for future research. Concerning the clitic omission stage in typical development one question to further investigate is whether the zero that appears in place of the expected clitic in this stage has a uniform nature and whether (at lest in some cases) it may reflect resort to a null-object type pronoun of the type found in various languages, which appears to correlate in non-trivial ways with the animacy of the object. Omission of clitics in the L2 population instead could be a different phenomenon, the reflex of real omission leading to the production of ungrammatical

sentences; indeed, L2 adults, much as the older SLI population have been shown to disfavor the zero option and to avoid clitics through the production of a lexical noun phrase in their place, namely they tend to adopt an option which, in fact, leads to the production of a grammatical sentence. Older SLI, much as (adult) L2 would naturally not allow anymore for the null-object option. Digging into the precise nature of the omitted element is a deep question, which deserves attention. Interestingly, it is now possible to devote the deserved attention to it precisely because much is known by now about the baseline of the acquisition of Italian object clitics.

The fact that past-participle agreement under cliticization is correctly supplied by children from very early on suggests that this agreement does not add much to the complexity of the structures. This result is particularly interesting in light of the results on different types of agreement in different contexts discussed in Moscati and Rizzi (2014). Moscati and Rizzi's results on a forced choice grammaticality judgment task have indicated that among four agreement contexts occurring in Italian – D–N, S–V, A–N, Cl-PastPart[40] – the one for which young children showed some difficulty in detecting a violation was precisely the Cl-Past Part one. Putting together the overall results presented in this chapter and the specific results on Cl-Past Part agreement reviewed with Moscati & Rizzi's results, the conclusion can rather safely been drawn that the source of the difficulty in the detection of the agreement violation revealed by the latter study should not be identified in the agreement process *per se* but rather in its implementation under cliticization, due to the complexity of the clicitization process. Further investigation is most welcome to verify the plausibility of this conclusion.

A number of domains have still not been investigated across different populations in different acquisition modes. The state of the art of the research on the acquisition of object clitics in Italian does not include results on the proper computation of the binding properties of pronominal clitics in the SLI population that could be compared to the results available on the typical population. The acquisition of clitics has not been systematically studied in typically developing children in more complex but quite central and productive structures in Italian including restructuring and causative verbs. The acquisition of indirect object clitics, corresponding to the dative clitic (*gli/le*), the partitive and prepositional clitic (*ne*), the locative clitic (*ci*), the acquisition of first and second singular and plural object clitics (*mi, ti, ci, vi*) are also domains in demand for careful investigation which could again be compared with the substantial baseline currently available on the acquisition of Italian 3rd person direct object clitics.

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**40.**   D–N: I galli/*il galli; S–V gli omini puliscono/*gli omini pulisce; A–N: i gattini sono piccoli/*piccolo; Cl-PastPart: Li ha sistemati/*sistemato.

# The acquisition of passive voices

## 4.1   Introduction

Following traditional descriptions, the term passive refers to structures in which, by virtue of the presence of a dedicated verbal morphology and other properties, such as the presence of a special preposition, in sum in the presence of a passive voice, the nominal arguments of a transitive verb are associated with different grammatical functions compared to sentences containing the same verb in the active voice. Active-passive pairs of sentences containing the same verb are illustrated by the English sentences in (1) and (2):

(1)   The mother washes the girl

(2)   The girl is washed by the mother

That the verb is the same verb in the two cases is indicated by the fact that the roles present in its argument structure are exactly the same in the two sentences; e.g. an agent and a patient in the standard pair in (1)–(2), or a theme and a goal, a theme and a source, a theme and an experiencer in the pairs in (3)–(5):

(3)   John received the letter // The letter was received by John

(4)   John sent the box // The box was sent by John

(5)   John fears the enemy// The enemy is feared by John

The pairs in (1)–(5) clearly illustrate the fact that the interpretation of both the external and internal argument of the different verbs, which are respectively associated with the grammatical function of subject and direct object in the active sentences containing them, remains exactly the same in the passive sentences, in which the internal argument is the subject of the clause and the external argument is the object of preposition *by*, a crucial component of the passive voice in English (see the classical work by Williams 1981 for the terms external/internal arguments). The well known facts in (1)–(5) are thus crucial properties, which any treatment of passive must capture; they have been given the deserved prominence since the first accounts in formal generative treatments (e.g. Chomsky 1965), and in particular since the P&P model up to the most recent accounts also in the minimalist tradition, as well as in the acquisition literature (e.g. Chomsky 1981; Baker et al. 1989; Collins 2005; Fox & Grodzinsky 1998). The relation that the pairs in (1)–(5) explicitly illustrate is at the source of the

core mechanism of the analysis for the derivation of passive involving movement of the internal argument into the subject position of the clause. The trigger of the movement computation is (some component of) the passive voice, which in English and several other languages is periphrastically expressed through a dedicated auxiliary BE + past participle + preposition *by* introducing the external argument, optionally overtly present. The Italian passive in these respects is very similar to the English one as is illustrated by the pairs in (6). The pairs in (6) also illustrate the possibility that beside the auxiliary *essere* the auxiliary *venire* can also be used (otherwise a verb of motion when not used as a passive auxiliary):

(6)   a.   La mamma lava la bambina
         The mother washes the girl

   b.   La bambina è/viene lavata dalla mamma
         The girl is/comes washed by the mother

   c.   Gianni spedì la lettera
         Gianni sent the letter

   d.   La lettera fu/venne spedita da Gianni
         The letter was/came sent by Gianni

*Essere* and *venire* are not always interchangeable and are not always equally adequate or even well formed to enter the passive voice of different lexical verbs. For instance, whereas *essere* allows for a stative interpretation *venire* is plainly felicitous with an eventive interpretation, e.g. *La porta è chiusa/La porta viene chiusa* (The door is closed/ the door comes closed). The eventive reading becomes the much preferred option in the past tense and it is the only option also with auxiliary *essere* with any tense when the *by* phrase is overt: e.g. *La porta fu chiusa/La porta è chiusa dal responsabile del presidio* (The door was closed//The door is closed by the guardian of the structure). Furthermore, with some verbs, in particular in the present tense, *venire* is preferred over *essere*: *Il permesso viene rilasciato dal responsabile/?Il permesso è rilasciato dal responsabile* (The permit comes delivered by the responsible/? The permit is delivered by the responsible)*; La traduzione viene trascritta in inglese/?La traduzione è trascritta in inglese* (The translation comes transcribed in English/?The translation is transcribed in English). There are thus interesting and subtle factors guiding the choice of the passive auxiliary in the Italian passive, which point both to the relevance of temporal/ aspectual distinctions and to lexical properties of different verbs. No detailed systematic account is present in the theoretical literature for these often subtle differences. We just mention them here at this purely observational level, as we will occasionally make reference to them in describing some results from acquisition studies to be reviewed, which may bear in part on these distinctions. That aspectual and lexical factors, ultimately related to the aspectual properties of the event that the verb describes, may be implicated and may constrain the computation of passive is proposed in Gerhke and

Grillo (2009). Thus, that auxiliary choice may be partly sensitive to the same distinctions is not unprecedented and surprising.

The cross-linguistic acquisition literature has agreed over the years that a full and productive mastery of passive is somewhat delayed until the age of 5–6 in typically developing children, with possible, although not necessary, differences according to: (i) whether the *by*-phrase is expressed, commonly referred to as long passive, or not, as in short passive (Fox & Grodzinsky 1998); (ii) whether the verb describes an actional event or a non actional/psychological one (Maratsos et al. 1985); (iii) whether the past participle can be given an adjectival stative/resultative interpretation or not (Borer & Wexler 1987; Hirsh & Wexler 2006; Gavarró, Parramon & Rallo 2013, the latter also testing structures according to the different stative auxiliary *ser* vs the resultative one *estar* in Catalan).[1] However, other studies have shown that different languages may differ as to the earlier mastery of passive (Demuth 1989), and different auxiliaries may yield different better results (e.g. *get* in English vs *be*, Crain 1991) also in those languages in which passive appears be delayed. Furthermore, if appropriate discourse conditions are created (e.g. focus interpretation of the *by*-phrase, presence of purpose clause) young children are able to both produce and comprehend passive also in a language like English already around age 3–4 (Crain et al. 1987/2009; O'Brien et al. 2006; Crawford 2012; Snyder & Hyams 2014).

Italian is no exception to this mixed picture. A full adult-like comprehension of passive can be documented at around age 5 (Ciccarelli 1998, and the discussion in Guasti 2007; Volpato et al. 2013; Manetti 2012 for more recent results to be reviewed in 3). In contrast, experimental studies utilizing the syntactic priming technique have documented an earlier mastery of passive in the production of 3 to 4 y.o. children, which also indicates a proper comprehension of the passive construction and the redistribution of arguments that it implies (Manetti 2013; 2012).

As for the acquisition of passive in different populations, little is known about the SLI population in Italian, although studies run in English (Marinis & Saddy 2013 for recent overview and new results for English) point to a general specific difficulty in the comprehension of passive sentences. Similar difficulties are found in the young L2 population analysed in this study. In addition, some indirect evidence for the later acquisition of passive may be provided for the adult L2 population; the relevant data are those presented in Chapter 5, which have indicated that recourse to passive in relative clauses, i.e. production of PORs/Passive Object Relatives when object relatives are elicited increases with the growth of the level of knowledge attained in Italian; the least advanced adult L2 speakers (from different L1s, most of them English L1) rather

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**1.**   Further cross-linguistic studies include Pierce (1992), Lau (2011), Terzi & Wexler (2002). See also Armon-Lotem et. al. (2014) for an overview and a cross-linguistic study.

produced the hard object relative structure than a POR, i.e. passive in the relative. This result has been interpreted as a sign of the difficulty in processing and efficiently accessing inflectional morphology, hence including the passive morphology, characteristic of the (adult) L2 population (consistent also with Franciotti 2014 recent experimental results on the adult L2 acquisition of the Italian passives).[2] In this respect this result conforms to the one just mentioned from Marinis and Saddy's study of English L2 children. Finally, a difficulty with the proper interpretation of non-actional reversible passives has been documented in a preliminary study by Reggiani (2009) run with dyslexic Italian speaking children. Given the scarcity of data on the acquisition of the Italian passive(s) in different populations, we do not further develop this theme here, and limit our presentation in this chapter to the illustration of the state of the art in the domain of typical monolingual development.

The chapter is organized as follows. The following subsection 1.1 illustrates the assumed derivation of passive in terms of the operation moving a chunk of the verb phrase, often referred to as *smuggling* (Collins 2005). Sections 2–2.1 are dedicated to the presentation of the experimental results on production of different types of passives in young children with special attention to what we will refer to as the *si*-causative passive; Section 3 reports on the available results from comprehension. The last section concludes the chapter and suggests elements for future research.
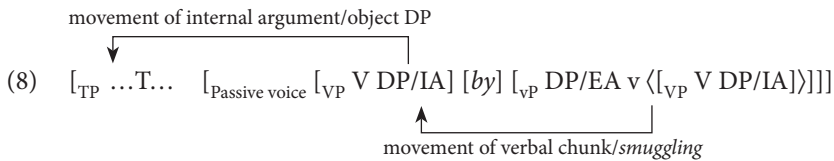
### 4.1.1   The derivation of passive

Although for the reasons discussed in the previous section, the derivation of passive should involve movement of the internal argument of the verb into the subject position of the clause, this movement cannot directly occur from the object position in which the internal argument (IA) is merged. One crucial reason for this is locality/Relativized Minimality (Rizzi 1990, 2004a; see also the related discussions in Chapters 5 on PORs, and Chapter 6 on POQs). Given a schematic representation as (7), direct movement of the internal argument into the subject position of the clause would inevitably cross over the external argument (EA) merged into a higher position of the vP- predicate:

(7)   $[_{TP} \ldots T \ldots [_{vP} \textit{DP/EA} \text{ v } [_{VP} \text{ V } \textit{DP/IA}]]]$

On the basis of locality considerations of this type, Collins (2005) proposed to reconsider the standard derivation and to assume that the derivation of passive is stepwise: it first involves movement past the external argument of a chunk of the verb phrase

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2.   MA thesis, University of Siena.

containing (at least) the (past participle of the) verb and its object/internal argument. The derivation, that Collins called *smuggling*, is triggered by the passive voice, identified with the preposition *by* in the schematic derivation in (8), one of its crucial components; the internal argument can then move from this position in the specifier of the passive voice into the subject position of the clause with no violation of locality/Relativized Minimality, as the external argument does not intervene anymore in the path of this movement from the higher position (see Chapter 5):

movement of internal argument/object DP

(8) $[_{TP}$ …T… $[_{Passive\ voice}$ $[_{VP}$ V DP/IA] [*by*] $[_{vP}$ DP/EA v $\langle[_{VP}$ V DP/IA]$\rangle]]]$

movement of verbal chunk/*smuggling*

The derivation of passive along the lines illustrated in (8) indicates that passive is not just a process, which crucially involves movement of a DP, i.e. the internal argument; movement of part of the predicate VP also takes place in the derivation. We note here, without further discussion, that this latter aspect of the derivation of passive is taken to be crucial also in an approach *à la* Gerhke & Grillo's (2009) where it is also tightly linked to the aspectual and discourse-pragmatic properties of the event described through passive (see the quoted work for details).

In the rest of this chapter, the analysis of passive along the lines illustrated in (8) will be assumed as the background analysis.

## 4.2 The production of Italian passive sentences in typically developing monolingual children

Recent studies by Manetti (2012, 2013) have investigated the ability to produce passive of young monolingual children acquiring Italian aged 3;5–4;6. Two picture descriptions tasks have been designed, which we review in turn. In the first task, children had to describe transitive actions involving an agent and a patient depicted in different pictures in a set of picture cards. They had to do so in response to two questions: a general question (referred to as neutral), *Che cosa succede?*/What happens?, and a patient-oriented question, e.g. *Che cosa succede al re?*/What happens to the king? In principle, the patient-oriented question can have two felicitous answers in Italian: an active sentence in which the object is realized as a pronoun (9a), with or without presence of the lexical topic object in a left or right peripheral topic position ((9)b, c); or a passive sentence with an expressed *by*-phrase (10). The sentences in (9) can be considered variants of the same structure (the one in (9a) involving a silent

topic, Belletti 2009). The sentences in (9), (10) are all appropriate answers to the question depicted in the picture in Figure 4.1 from Manetti's set of cards:



**Figure 4.1.**  Question: *Che cosa succede al re?*/What happens to the king?

(9)  a.  La mucca lo lecca
         the cow him-CL licks

     b.  Il re, la mucca lo lecca
         the king, the cow him-CL licks

     c.  La mucca lo lecca, il re
         the cow him-CL licks, the king

(10)  (Il re) è/viene leccato dalla mucca
      (the king) is/comes licked by the cow

12 children aged 3;5–4;6 have been tested on a total of 24 questions, 8 neutral questions, 8 agent-oriented questions, and 8 patient-oriented questions. The agent-oriented questions elicited active SVO answers (*La mucca*) *lecca il re*//(the cow) licks the king, with a null subject preferred in Italian in the given context). There was a group of 12 adult controls. Table 4.1 summarizes the results of this task:

**Table 4.1.**  Percentages of children's and adults' productions of passive sentences and other structures as a function of question type, Agent-oriented, Patient-oriented and Neutral (adapted from Manetti 2013)

| Question type | Children | | | | Adults | | | |
|---|---|---|---|---|---|---|---|---|
| | (S)VO | Pronoun | Passive | Other | (S)VO | Pronoun | Passive | Other |
| Ag-or | 65% | 25% | 0 | 10% | 97% | 0 | 0 | 3% |
| Pat-or | 26% | **62%** | 0 | 7% | 5% | 3% | **90%** | 2% |
| Neutral | 54% | 36% | 0 | 10% | 81% | 0 | 15% | 4% |

The most striking and highly significant result of this production task is that the young children tested never produced a passive answer, not even in the patient-oriented question condition, where passive was instead the overwhelmingly preferred answer obtained from the adults. In this condition, children rather strongly preferred the use of a transitive active structure with a pronoun expressing the topic object of the type in (9). It thus seems that the young children tested did not spontaneously choose the passive answer, which was one of the appropriate choices in the discourse condition set by question-answer setting. Rather, they went for the pronominalization of the object as in (9). Children also selected a simple transitive clause in a number of cases in the same condition (26%), thus providing a purely descriptive statement (rather than a real answer). In contrast, adults reacted with a simple (S)VO transitive clause, and again overwhelmingly so, only in answering agent-oriented questions (97%). A simple (S)VO response was also the preferred answer given by children (65%) in this condition, although children also reacted with a sentence with a pronoun object in the same condition (e.g. *Che cosa fa la mucca?*/What does the cow do? Expected answer: (*La mucca*) *lecca il re*/(The cow) licks the king – Given answer: (*La mucca*) *lo lecca*, i.e. same as (9)). Essentially, children have overproduced sentences with a pronominalized object, also in situations in which the object was not the topic. For this latter point, we may speculate that since both characters were given in the picture, children simply assumed that the object was shared knowledge with the experimenter and thus used the pronoun for it (Manetti 2013; De Cat 2009 for rather similar overuse of pronouns by young children acquiring French).[3] Finally, the SVO answer is the preferred option for adults also in the neutral question condition (81%), although some descriptive statements in the passive are also given (15%). In the same condition, children did also prefer the simple transitive SVO answer (54%), but they also answered with a pronoun object (type (9)) in 36% of the cases, thus giving further support to the speculation just made for this further instance of overuse of pronoun. Again, in contrast to adults, no passive is produced by children in the neutral condition as well (adults: 15%). Taken together, these results indicate that, on the one hand, children provide types of answers which are less clear-cut in the different conditions; on the other hand, they also show that passive is never a selected option, independently of the condition. In the answer to a patient-oriented question, children preferred to use a pronoun to express the object, with overt or non-overt presence of a lexical topic in the left or right periphery of the clause (as in (9)).

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**3.** It could also be that since the same experiment also contained conditions in which use of the pronoun was felicitous (those with the topic object), this very fact constituted a sort of indirect priming for use of the pronoun for children. A question worth exploring further.

Production of sentences with a pronoun for the object has also been found in an elicitation experiment by Volpato et al. (2012a), who tested, with a picture selection task, 75 Italian speaking children ranging in age from 3;5 to 6;2 (17 children belonged to the youngest group 3;5–4;3 almost perfectly matching the age of Manetti's group; the other groups of comparable size were: 4;4–5;1; 5;2–6;0; 5;6–6;2). Each child was presented with two pictures containing the same character for the patient, but two different characters for the agent, thus aiming at creating felicitous conditions for the expression of the the *by*-phrase (Crain et al. 1987/2009). Also in this study, the authors found that sentences with a pronoun for the object were produced in a significant proportion across the different age groups. Manetti's results are sharper in showing children's preference for the pronominalization solution, thus indicating that the type of experimental setting may play a role. Be it as it may, resort to pronominalization of the object and no resort to passive (or very limited, 14% in Volpato et al. 2012a), clearly indicate that in an elicitation situation in which children are relatively free to select their answer, they clearly prefer not to select passive. Based on these results and given the sharp contrast with adults, who resorted to passive up to 90% in the relevant condition, one could conclude that children acquiring Italian have barely any knowledge yet of the passive computation in this young age range. This would be in line with the similar conclusion of some of the cross-linguistic literature mentioned in the introductory section.[4]

However, this is probably not the correct conclusion, also in line with some (other) of the cross-linguistic literature mentioned in the introductory section. It was already observed in Chapter 1, Section 8 that omission of auxiliary BE and use of bare past participles by 2 to 3 year old Italian speaking children witness an early access to some of the components of the passive computation. We noted in passing above that Volpato et al. (2012a) found a 14% of production of passive answers in the youngest group of children they tested, thus indicating that, even if selected in a limited (though not negligible) amount, children do have access to the computation involved in the derivation

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4.    The reason why adults almost never selected answers with an object pronoun also in the condition in which it would be a felicitous answer in Italian (3% in the patient-oriented condition) is an independent question. A similar behavior has been found in the production of wh questions by adults. See Chapter 6. A possible reason could be a normative pressure, which attributes a rather informal colloquial status to dislocation structures, thus considered inappropriate in the experimental situation. We leave the question here and just make two further observations: (i) adults' behavior indicates that passive is a productive computation in standard Italian; (ii) Children do not reproduce adult-like behavior. This latter feature of children's behavior does not lead to non-target/ incorrect productions, but to the selection of productions that are adequate, both morphosyntactically and as for their discourse-pragmatics, but just different from those that adults prefer. It is natural to conclude that the ultimate formal grammatical mechanisms involved may be responsible for children's selection. This is a research question under current study.

of passive. Moreover, the 14% passive sentences have been produced by young children with both auxiliary *essere* (42%) and with auxiliary *venire* (58%), thus suggesting a productive and differentiated access to the passive computation from the early ages. As noted in the introduction, the auxiliary *venire* is only compatible with an eventive interpretation and incompatible with a resultative/stative, hence possibly adjectival, interpretation. The idea of analyzing early passive productions as cases of adjectival passives, which would not involve any syntactic movement but just a lexical operation, does consequently not look plausible (contra Borer & Wexler 1987, and related literature; Guasti 2002, 2007 for an overview of the acquisition issues raised in the literature assuming the standard analysis with direct movement of the internal argument from the object position into the subject position of the clause). Notice that also in Manetti's results from adults, the vast majority of passives were produced with the auxiliary *venire* (75%) all involving an eventive, non-stative interpretation. Moreover, Volpato et al. (2012a) also report early use of long passives containing a *by*-phrase (i.e. a *da*-phrase the Italian equivalent of *by*, contra Fox & Grodzinsky 1998); this is a further clear indication of a syntactic derivation of the passive structures produced. Interestingly, similar findings on early productions of passives, including long passives, are also reported in Manetti's (2013) results from the second task referred to above, to which we now turn.

Manetti's (2013) second task used a syntactic priming technique adapted to Italian from the design developed in Branigan et al. (2005) (already utilized to test the production of passive in 3-year-olds in English by Messanger et al. 2008; Messanger et al. 2011); Branigan et al. in turn, partly adapted Bencini and Valian's (2008) priming design in the form of a picture-description *snap*-game that children enjoyed playing. The rationale behind the priming technique is that the exposure to a given structure may enhance the production of that structure in a different utterance. Moreover, since, as we saw, other structures with an object pronoun with or without an overt dislocated lexical phrase are possible alternative answers that children appeared to even prefer to passive in the previous elicitation task, the priming technique avoids the difficulty of providing a felicitous discourse context in which passive may be the only option. Differently from the pure elicitation task described above, production of passive may thus be facilitated through the priming of the passive structure. Passive was primed through the *snap*-game in which cards describing transitive events were depicted. In the game, the experimenter and the child are given two different sets of covered cards. The experimenter describes and uncovers his/her own card, the child does the same with his/her own card. In describing the uncovered card, the experimenter utters a simple sentence. The child has then to describe the card that she has uncovered. The primed structures in the passive are interspersed among the randomized descriptions pronounced by the experimenter. The effect of priming is measured on the description provided by the child, according to the sentence prime pronounced

by the experimenter. The set of cards to be uncovered by the experimenter and the set of cards to be uncovered by the child describe different events. The difference of the two sets of actions depicted is important as it distinguishes priming from repetition, a crucial distinction. The pictures used were the same as in the elicitation task described earlier. 12 target actional verbs were utilized; 6 verbs were used as prime cards. The target cards consisted of 24 sentences that children had to describe and there were 24 prime sentences/cards. Active primes were SVO sentences; passive primes used the auxiliary *essere* or the auxiliary *venire* (Manetti 2013 for a detailed description). There were two lists, in one list the passive prime was with auxiliary *essere*, in the other list it was with auxiliary *venire*. Thus, for a picture like the one in Figure 4.2, the active prime sentence, the passive prime sentence for the *essere* list and the passive prime sentence for the *venire* list are given right below. The child had then to describe an unrelated picture in turn, e.g. the one depicted in Figure 4.3:



**Figure 4.2.**  Prime card described by the experimenter



**Figure 4.3.**  Target card to be described by the child

| Active Prime: | La rana picchia il re |
| | the frog hits the king |
| Passive Prime *venire*: | Il re viene picchiato dalla rana |
| | the king comes hit by the frog |
| Passive Prime *essere*: | Il re è picchiato dalla rana |
| | the king is hit by the frog |

The general picture emerging from the results is the following: active primes significantly favored the production of active SVO sentences (68.4%; 287 out of a total of 419 sentences produced); passive primes with *venire* and with *essere* significantly favored the production of passive sentences, and significantly more so with *venire* (26%; 55 out of a total of 209 sentences produced) than with *essere* (15%; 31 out of a total of 210 sentences produced). Children also produced sentences with an object pronoun of the type in (9), with no difference according to whether the prime was active or passive and to the auxiliary used in the passive prime (5%, 22 out of a total of 420 sentences produced in the *venire* list; 10%, 42 out of a total of 418 sentences produced in the *essere* list, amounting to 7.6%, 64 out of 838 sentences produced). This last result indicates that the pronominalized structure may be occasionally chosen by children independently of discourse conditions, hence also in the neutral setting of the picture description task (possibly because the object could be taken as shared knowledge by the child once she uncovers the card she has to describe; see above for a similar consideration on the use of structures like (9) in the agent-oriented questions of the elicitation task).

Results from Manetti (2012), as also discussed in Manetti & Belletti (2014), indicate that adult controls did not show sensitivity to the primed structures as they overwhelmingly selected a simple active transitive structure SVO to describe their card, irrespective of the priming (up to 88% under a passive prime). This different sensitivity to priming between adults and children which has emerged in the Italian priming experiment remains as an open question for the time being; it could be due to a number of factors, not all necessarily grammatical-formal factors which we will not attempt to make explicit and leave as a topic of further research.[5] Let us concentrate instead on the relevance of the priming effect emerged in children's productions as for the question whether and how much of the passive computation young children acquiring Italian can be claimed to know. The answer to this question supported by the results is that children in the early age tested appear to know the computation involved

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5. Vernice (2009) did find sensitivity to passive priming in adults as well in a different priming experiment in which animacy of two nominal arguments was manipulated: more passive sentences were produced under a passive prime when the agent was inanimate (e.g. *La ragazza è colpita dal masso*/the girl is hit by the stone vs *Il masso colpisce la ragazza*/the stone hits the girl).

in passive, and this with both auxiliaries. A conclusion, which is consistent with the one reported above based on the elicitation experiment by Volpato et al. (2012a). Furthermore, the fact that the priming effect was stronger with active primes than with passive primes is not particularly telling, since, as just noted, for adults it was even more so as they resorted to active SVO sentences at a much higher rate; hence, this does not reveal much about the knowledge of the formal computation involved in passive. It just indicates that a neutral description as the one required, is preferably realized with an active sentence. The overall priming effect in children is summarized in Table 4.2:

**Table 4.2.** Percentages of different sentences produced by children as a function of priming condition, active or passive prime, and in the last case with auxiliary venire or essere. On the last line, the priming effect in children calculated as the result of the difference between the primed sentence pronounced by the experimenter and the sentence produced by the child (adapted from Manetti 2013)

| Prime | *venire* | | | | *essere* | | | |
|---|---|---|---|---|---|---|---|---|
| | SVO | Pronoun | Passive | Other | SVO | Pronoun | Passive | Other |
| Active | 72% | 5% | 7% | 16% | 65% | 9% | 1% | 25% |
| Passive | 39% | 5% | 26% | 30% | 43% | 10% | 15% | 31% |
| Effect | +33% | 0% | +19% | +14% | +22% | +2% | +14% | +6% |

The category "Other" in Table 4.2 groups together productions of short, incomplete, non-adult like passives (e.g. correct passive morphology but Th-roles reversed, passive with morphosyntactic errors such as selection of a preposition different from *da* to introduce the agent), with productions of intransitive verbs, copular sentences and single noun phrases which also occurred in children's productions.[6] Most of the passive sentences that children produced were correct adult-like passive sentences. If also short passives are included in the counting (see Footnote 6), correct adult-like passives amount to 72% of children's productions with auxiliary *venire* and to 59% with auxiliary *essere*. The most common mistake that children made while producing a sentence with the passive voice was the reversed assignment of Theta-roles, i.e. children used the passive morphology, but assigned the arguments' roles in a reversed

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6. This is a very restrictive counting criterion, as especially for the case of short passives, it underestimates the ability to compute passive by children, in particular with the auxiliary *venire*, as it turns out. The criterion has been strict since the description should have included the *by*-phrase to be complete.

way, as in an active sentence (e.g *La mucca è leccata dal re*/The cow is licked by the king, as a description of the picture in Figure 4.1). Sentences with the passive voice and reversed Theta-roles are equivalent with both *venire* and *essere* auxiliaries (23% and 25% respectively).[7] Deviant passives (e.g. with the wrong preposition) amount to 5% and 16% in the two *venire* and *essere* lists.

On the basis of the results presented in this section, it is then fair to conclude that when young children produce a passive sentence in Italian they do so mostly correctly as in their target language; hence, they manipulate grammatical functions and verbal morphology in a way that properly describes the event they are supposed to describe. Assuming a derivation of passive along the lines in (8), this amounts to concluding that young children (age range under discussion 3;5–4;6) can master the *smuggling* operation triggered by the passive voice, moving a chunk of the verb phrase.[8] Presumably, this is a complex operation somewhat hard to perform for their relatively immature computational system. This may explain why in the less constrained task eliciting more spontaneous answers, children rather resorted to the pronominalization of the object than to passive, in contrast with adults, whose system is better equipped for this complex computational step (Table 4.1). However, in appropriate conditions such as under priming, passive both with auxiliary *venire* and with auxiliary *essere* can be correctly performed/produced by children; this was also (partly) the case in the picture description task of Volpato et al. (2012a), which elicited the production of 14% of correct passives in the answers provided by the youngest group of children analyzed in that study. The computation involved in passive may be considered complex for a number of possible reasons. We list three of them in concluding this section: i. The identification of the relevant chunk of the verb phrase to move; ii. The identification of the morphosyntactic property of the relevant head that contributes to the passive voice as the head attracting syntactic movement of the relevant chunk of the verb phrase into its specifier; iii. The fact that further movement

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7.    Note that this may suggest that the priming technique could also favor a "match" type production to some extent. I.e. the child describes the card with a SVO sentence but uses the wrong morphology corresponding to the passive prime sentence. However, the match-effect alone would be silent on the reason why, in both lists, children also correctly assign Theta roles and redistribute the grammatical functions accordingly, as required in passive. The ample amount of redistribution of grammatical functions concomitant to passive prime and related passive morphology in children's productions thus strongly indicates access to the passive computation.

8.    Hence, the apparent delay in the acquisition of passive cannot be simply due to unavailability of smuggling, although this operation may be costly for children. See Hyams & Snyder (2005) for relevant discussion; Belletti (2014, 2012) for discussion connected to the development of Passive Object Relatives in children. See infra and the following Footnote 9.

must occur from the smuggled constituent. Other reasons may also be at play; this is where the research on these issues now stands and from which it is currently moving further.[9]

### 4.2.1    Notes on *si*-causative passive in young children

Manetti and Belletti (2014) have extended the same priming technique utilized in the priming experiments just described by introducing a different type of passive prime sentence that we will refer to as *si*-causative passive. A sentence containing a *si*-causative passive is illustrated in (11):

(11)    Il bambino si è fatto pettinare dalla mamma
the kid SI-Cl/himself is made combed by the mum
*the kid had himself combed by the mum*

Let us first provide some of the essential elements of the assumed analysis for this type of passive and then present the results from the experiment. The crucial property of the *si*-causative passive is that a Romance-type causative structure, so called *fare-da* (*Faire-par* of Kayne's 1975) is utilized in combination with reflexive clitic SI. In the *fare-da* causative the external argument of the infinitival complement of the functional causative verb *fare* is introduced through preposition *da*/by, i.e. the same preposition introducing the external argument in *copular* and *venire* passive sentences. This is also possible in active causatives of the *fare-da* type, exemplified in (12):

(12)    Il papà ha fatto pettinare il bambino dalla mamma
the dad has made comb the kid by the mother

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9.    In a recent article Snyder and Hyams (2014) have proposed that, differently from adults, young children may be assumed to derive passive through direct movement of the internal argument into the subject position of the clause, as in standard accounts, presumably for an intrinsic complexity of the *smuggling* operation moving a chunk of the verb phrase (see Footnote 8 and discussion in the text on this). According to Snyder and Hyams (2014) this direct derivation is only possible if compatible with featural Relativized Minimality (Rizzi 2004a, and discussion in Chapter 5). Hence, passive is available to young children only in cases in which the moved internal argument is enriched with a feature (e.g. Topic) not shared with the intervening external argument. This is an interesting account consistent with the literature quoted in the introduction according to which passive is best mastered by young children if appropriate discourse conditions are created, i.e. conditions in which the internal argument is a discourse topic and the external argument/*by*-phrase is the focused argument. Snyder and Hyams' proposal may very well be on the right track for these cases; however, the results discussed in this section have indicated that young children appear to master passive to a fairly significant extent also independently of the pragmatics of the discourse exchange, as appears to be the case in the priming setting. This suggests a "primed" access to the hard/complex passive derivation involving movement of a chunk of the verb phrase.

In contrast with (12), in the *si*-causative passive the external argument of the functional causative verb *fare* is not present; instead the reflexive clitic SI occurs. Its presence appears to have the same effect as a (component of) passive voice in that movement of the object of the embedded infinitival verb into the matrix subject position occurs. Both active *fare-da* causatives as in (12) and passive *si*-causatives as in (11) may be assumed to involve movement of a chunk of the verb phrase along the same lines as in periphrastic passive (cfr. (8)).[10] The *si*-causative passive also involves movement of the internal argument from the smuggled infinitival complement of the causative verb into the matrix subject position. The crucial steps of the assumed derivations are illustrated in (13)a and (13)b for the active causative (12) and the *si*-causative passive (11); (13)c illustrates the partly analogous derivation of the periphrastic passive (exemplified with auxiliary *venire*):[11]

(13)

a.  Il papà ha [$_{vP}$ ⟨il papà⟩ fatto [$_{VP}$ pettinare il bambino] [dalla [$_{vP}$ mamma ⟨VP⟩]]]

movement of verbal chunk/*smuggling*

movement of the internal argument

b.  Il bambino SI-cl è [$_{vP}$⟨SI-cl⟩ fatto [$_{VP}$ pettinare ⟨il bambino⟩] [dalla [$_{vP}$ mamma ⟨VP⟩]]]

movement of verbal chunk/*smuggling*

movement of the internal argument

c.  Il bambino viene [$_{VP}$ pettinato ⟨il bambino⟩] [dalla [$_{vP}$ mamma ⟨VP⟩]]

movement of verbal chunk/*smuggling*

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**10.**   The analysis of causatives involving a *smuggling* type operation sketched out in text may be seen as an update of traditional accounts such as Burzio's (1986), Rouveret and Vergnaud's (1980) analyses in terms of VP-preposing, in the spirit of Kayne (1975); Guasti (1993,) for an approach in terms of incorporation à la Baker (1988); Zubizarreta (1985) for a first functional characterization of *fare*.

**11.**   Belletti (2013a) and Manetti and Belletti (2014) for further details on the assumed argument structure and related derivation, which are given here in a schematic fashion intended to highlight the crucial steps and the common properties of the structures considered: active *fare-da* (13a), *si*-causative passive (13b) and periphrastic passive (13c) illustrated with the auxiliary *venire*. The Merge position of the moved constituents is indicated between ⟨ ⟩ parentheses as is usual practice. On the analysis of causatives in related terms see also Guasti & Moro (2001).

As (13) illustrates, *si*-causative passive includes a *smuggling* type step in the derivation, as in both active *fare-da* causative and in periphrastic passive; with periphrastic passive it shares movement of the internal argument from the *smuggled* position into the subject position.

Results from the priming experiment utilizing *si*-causative passive as the passive prime have indicated that children were somewhat especially sensitive to this type of passive. Looking at their overall productions of passive sentences under the priming experiments, results have indicated that periphrastic copular passive with auxiliary *essere* constituted the 8% (36/444 sentences); periphrastic passive with auxiliary *venire* the 17% (77/466 sentences); *si*-causative passive the 14% (65/468 sentences). Notice incidentally that the passive with *venire* auxiliary is the type of passive produced at the highest rate by children in these experiments. This is not surprising since the verbs used in the lists were all actional verbs implying an eventive interpretation, and *venire* auxiliary is particularly felicitous with actional verbs, as mentioned in the introduction. The results from the priming experiment in which the prime were *si*-causative passive sentences indicate that children's production of *si*-causative passive is about the same as the production of passive with auxiliary *venire*. A further important fact is that, in the *si*-causative passive experiment – i.e. the experiment in which the passive prime sentences were of the *si*-causative type – children have produced *si*-causative passive sentences also in cases in which the prime description pronounced by the experimenter were active sentences. A similar response never occurred in the experiments in which the passive primes were passive sentences with either auxiliary *essere* or auxiliary *venire*. Furthermore, children also happened to produce *si*-causative passive sentences when the prime sentence was a periphrastic copular passive sentence; this never happened in the symmetric condition (i.e. never a *si*-causative passive prime lead to the production of periphrastic passive, with either auxiliary *essere* or *venire*). Hence, production of *si*-causative passive seems to be somewhat privileged for children. We will not attempt to formulate hypotheses here as to why it should be so since this is a topic of ongoing research.[12] We just note in conclusion a possible relation between these results from the priming experiments with two previous findings from independent unrelated studies. Belletti and Contemori (2010) and Contemori and Belletti (2013) have found that the earliest productions of PORs (Passive Object Relatives; i.e. relatives with passive when an Object relative is elicited, Chapter 5) by young

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12.   Adults produced virtually no *si*-causative passive in the experiment with *si*-causative passive as a prime (2%; 7/288 sentences); they rather produced some periphrastic copular passive in this condition (5%, 13/288 sentences). This result is almost symmetric to the result from children described in the text, it is also especially telling since adults tended to produce very few passives in all of the conditions anyway, as mentioned. The comparison adults/children is the topic of current study by Belletti and Manetti.

children (3;4–3;11 and 4–4;11) included just *si*-causative passives. Contemori and Belletti (2013) have then found that PORs with *si*-causative passive were those best comprehended by older children (6;5–8;10) when compared to both Object relatives in the active and to different types of PORs which were also found in children's productions, i.e. containing copular passive and reduced passive relatives (e.g. *il bambino* (*che è*) *pettinato dalla mamma*/the child (that is) combed by the mother). There is thus a convergence between these independent results from PORs and the results reviewed here from the syntactic priming experiment: *si*-causative passive appears to be the type of passive that children master best and (possibly) first in their development.[13] More data and results will have to support this conclusion.

## 4.3    Some results from comprehension in monolingual children

Volpato et. al (2013) have examined the comprehension of passive sentences in 75 Italian speaking children aged 3;4–6;2 using an adaptation to Italian of the picture-sentence matching task first designed and applied to Greek by Driva and Terzi (2008) (see also Terzi & Wexler 2002). The material included both action and non-action verbs, long and short passives, and passive with auxiliary *venire* and with auxiliary *essere*. The picture mismatch condition was realized with either reversal of roles between the two nominal arguments or with presence of a different agent. Table 4.3 below summarizes their main results:

Children's performance became better with age, ranging from the lowest 48% in the younger groups and 94% in the older with non-actional verbs and between 76% and 100% with actional verbs, thus suggesting a development. These results show that there is no difference in the comprehension of long or short passive, no interaction between verb type and long passive (contra Fox & Grodzinsky 1998), and no difference in the comprehension of passive sentences with either auxiliary *essere* or *venire*. Volpato et al. (2013) found that by age 5 children comprehended the passive of action verbs at ceiling, whereas comparable adult-like comprehension of non- actional passive sentences was reached later around age 6. Thus, these results are in line with the cross-linguistic evidence mentioned in the introduction, and in particular with Driva & Terzi's (2008) results whose design had been extended to Italian in this study (see also Hirsh & Wexler 2006 on English for similar conclusion). As the authors have

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**13.** The *si*-causative passive is the closest analogue to the English *get*-passive that is also interestingly known to be accessed early by children (Crain 1991). The derivation of *get*-passive may be assumed to also involve movement of a verbal chunk of the causative type (Belletti 2014; see also Alexiadou 2006 for a different approach with no syntactic movement).

**Table 4.3.** Percentages of correct responses in a picture-sentence matching task examining comprehension of passive sentences based on action and non-action verbs and including or not by-phrase. Passive sentences included the auxiliaries essere and venire (from Volpato et al. 2013)

| Age group | By-phrase | Act. verbs | Act. verbs | Non-act. verbs | Non-act. verbs |
|---|---|---|---|---|---|
|  |  | *essere* | *venire* | *essere* | *venire* |
| G1 | Yes | 77% | 76% | 58% | 59% |
| 3;4–3;22 | No | 89% | 85% | 67% | 61% |
| G2 | Yes | 77% | 78% | 68% | 48% |
| 4;0–4;8 | No | 75% | 74% | 56% | 53% |
| G3 | Yes | 89% | 96% | 56% | 58% |
| 4;9–5;5 | No | 94% | 96% | 56% | 67% |
| G4 | Yes | 95% | 92% | 66% | 75% |
| 5;6–6;2 | No | 100% | 100% | 75% | 94% |
| Adult | Yes | 100% | 100% | 99% | 100% |
| 20–24 | No | 100% | 100% | 100% | 100R |

pointed out, good comprehension of passive sentences with both auxiliary *venire* and auxiliary *essere* provides clear evidence that even young children appear to be able to master the morphosyntactic passive computation at a fairly good level. This is particularly clear in the case of passive with the auxiliary *venire* since this type of passive does not admit the interpretation as a resultative state, hence it is a verbal passive and cannot be an instance of adjectival passive not involving syntactic movement, as might be possible in other cases involving auxiliary *essere* (contra Hirsh & Wexler 2006).

Manetti (2012) has addressed the study of the comprehension of passive sentences with three different experimental methods:

– Comprehension through a Truth Value Judgment Task (TVJT) of scenes shown in short videos: three groups of 20 children each, age range 4;1–6;11. The passive sentences were tested with actional verbs (reversible) and auxiliary *essere*; stimuli contained long and short passives. A puppet pronounced a sentence and the child was supposed to say whether or not what the puppet said was true.[14]

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**14.**   If the answer was "no", the child was then asked: "What happened in fact?" The task thus partly turned into a production task. Both children and adults tended to answer with an active clause. There were also passive sentences produced, though, from 32% in the younger group of children up to 44% in the older; adults produced 45% of passive answers. Hence, the amount of passive answers provided by the older children matched that of adults; whereas younger children produced less passives in these conditions.

– Comprehension through an Act-Out Task (AOT): three groups of 33 (younger) children, age range 3;5–5;11. The passive sentences were tested with action verbs (reversible) and auxiliary *venire*; the *by*-phrase was present in all the stimuli. Each child heard a sentence pronounced by the experimenter and had to act out the scene with little puppets.
– Comprehension through an adaptation of Messanger et al.'s (2008) Picture Matching Task (PMT): two groups of children, age range 3;5–4;6; the experimental sentences contained passive sentences with both actional and non-actional verbs.

The interesting feature of the overall results, details of the results of each single task aside, is their coherence: the only group of children which had difficulties in comprehending the passive sentences proposed and which showed a variation among the participants, always was the youngest one. Around the age of 4;6 children showed a very good comprehension of the passives tested. There were some (probably) task-related peculiarities that emerged in the third task, likely to be due to the complexity of the design. Hence, we now highlight in better detail some of the most significant results of the first two tasks.

In the first study with the TVJY, the group of younger children was further divided into two subgroups, and this clearly revealed the developmental point, as is illustrated by Figure 4.4:
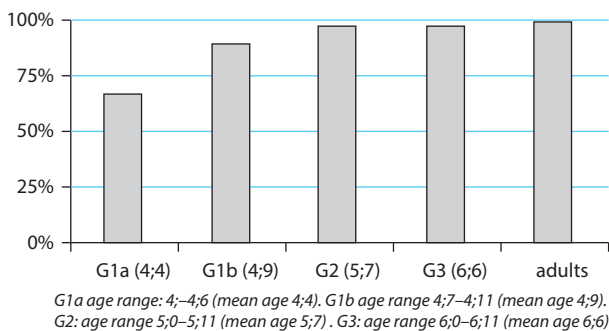


*G1a age range: 4;–4;6 (mean age 4;4). G1b age range 4;7–4;11 (mean age 4;9).*
*G2: age range 5;0–5;11 (mean age 5;7) . G3: age range 6;0–6;11 (mean age 6;6).*

**Figure 4.4.** Percentages of correct responses in the TVJT examining comprehension of long and short passive sentences including actional verbs and the auxiliary essere (from Manetti 2012)

The analyses revealed that G1a children had a lower comprehension of passive (67%) than the older children, in particular G1b children, whose comprehension already reached 90%. Long or short passive did not make a difference, coherently with the results from Volpato et al. (2013) discussed above.

In the second AOT, all groups of children were at ceiling in the comprehension of active sentences, and reached a comparable level of comprehension of passive sentences with actional verbs around age 4; again, as in the TVJY experiment, the crucial

age turned out to be 4;6, as it is at this age that children showed a well above chance performance (84%) of good comprehension of passive sentences. It can be pointed out that in the third PMT, a significant effect of voice emerged only the younger group aged 3;5–4;0 whose comprehension of the passive sentences (70%) was lower compared to the comprehension of the active sentences presented in the task (86%). There was no such effect in the older group aged 4;1–4;6, as these children comprehended active and passive sentences of action verbs equally well (92% in both cases). This result is in line with those of the two other tasks (TVJT, AOT).

All in all, the results from the comprehension studies reviewed in this section have indicated that young children have a good comprehension of passive sentences containing actional verbs from the early age, although they may experience some difficulty in the earliest stages tested. Somewhere between age 4 and 5, the proper comprehension of the passive tested with both auxiliary *essere* and auxiliary *venire* reaches ceiling and is adult like. The comprehension of non- actional passives is generally harder, and sometimes related to the complexity of the design, coherently with cross-linguistic findings. Furthermore, the fact that both long and short passives are equally well comprehended by young children in the described tasks in which presence of the *by*-phrase was pragmatically appropriate, indicates that there is no special difficulty with long passives *per se* (contra e.g. Fox & Grodzinsky 1998; Hirsh & Wexler 2006; in line with Crain et al. 1987/2009).

## Summary and questions for future research

The study of the acquisition of the Italian passive, in both production and comprehension has been the focus of this chapter. New evidence from recent results has been accumulating over the last few years indicating a fairly early access to the passive computation by Italian speaking children. Around age 4, but also before that already at 3;5, children have been shown to be able to produce sentences with verbal passive morphology and to understand them also in the so called *long* version containing the *by*-phrase. Different passive auxiliaries have been tested and the one that is mastered best by young children is auxiliary *venire*, better than auxiliary *essere*. The former is the auxiliary that best accompanies actional verbs; hence this result is in line with previous crosslinguistic findings that actional passives are mastered better by young children than non-actional ones; it was pointed out that this indicates access to the relevant syntactic computation involved in passive, which has movement as one of its crucial ingredients. The results thus also indicate that early passives in children are not (all, necessarily) instances of adjectival passives, as had been previously proposed because auxiliary *venire* is inconsistent with the adjectival reading. Results also seem to indicate a preference by children to access the type of passive labelled *si*-causative passive in the studies reported here.

Several new research questions are opened by the results reviewed in this chapter. First of all, there is a need to enrich the database of results in this domain since we do not know anything about the status of the different types of Italian passive in the atypical population, nor do we have evidence on the adult L2 population and on bilingual children. Since the baseline from typically developing children is by now fairly rich and articulated, it should become possible to start collecting this new type of evidence.

A number of questions can be based on these results of direct theoretical interest, which deserve attention. We mention a few of them. If the derivation of passive through movement of the relevant verbal chunk is involved in all types of passives, the question of what the origin of the special status of the *si*-causative passive is arises, and this is also in need of further confirming evidence. As is always the case, crosslinguistic evidence may help us understanding this result, as it is known that passive involving causatives are very common across languages. A natural comparison to do, which is in fact the topic of current research is with French. Notice that children's preference for *si*-causative passive in standard Italian cannot be considered an input related effect, as this type of passive is virtually absent in adult Italian. This has been shown by the results from some of the experiments on passive presented in this chapter and from those presented in Chapter 5 in connection with the discussion of Passive Object Relatives/PORs: adults hardly ever produce *si*-causative passives.

More generally, the assumed derivation opens up the study of other structures that involve similar movements of chunks of the verb phrase, such as e.g. causatives, psych-verbs, raising…This is an ongoing project in the theoretical work on Italian and also crosslinguistically, as mentioned; it would be most interesting to enrich the database with evidence from acquisition.

The relation between the aspectual and lexical properties of the verb and the nature of its argument structure are also a very relevant topic to pursue also in light of the results available so far, which have been presented here. The more readily access by young children to passives using the auxiliary *venire* rather than the auxiliary *essere* deserves careful study along the aspectual and lexical dimension.

Some of the results presented come from experiments in which syntactic priming techniques have been used. What the exact status of syntactic priming is and what aspects of the speaker's linguistic knowledge it may reveal is an interesting open question to address in detail. The results presented have suggested that children are more sensitive to syntactic priming than adults, who have rather systematically reacted with an active sentence to a passive prime. In contrast, children did sometimes react with a passive sentence to a passive prime. Taken at face value, this would seem to indicate that children are better at passive than adults, a rather paradoxical conclusion. Hence, more needs to be understood on the specific contribution of syntactic priming in different populations.

# The acquisition of some (discourse) interface properties

# The acquisition of relative clauses

## 5.1   Introduction

As is the case in many languages, standard headed restrictive relative clauses in Italian have a gap within the relative clause, which immediately follows the relative noun phrase head; the gap corresponds to the argument position of the relative head inside the relative clause. Throughout, the general term "relative clauses" or "relatives" will be used; it will only refer to restrictive relative clauses (unless otherwise specified). The gap is notated as "⟨___⟩" in the following Examples (1)a, b illustrating a subject and an object relative, respectively; (1)c illustrates an object relative with a post-verbal subject, a possible structure in Italian. As will be discussed later, when the relative head and the post-verbal subject share the same number (e.g. both singular as in 1c), the relative is ambiguous as it can also be interpreted as a subject relative with identical linear word order with (cfr. 1a). Both (finite) subject and object relatives are introduced by the relative complementizer "che" (the same complementizer introducing finite declaratives in Italian); if the relative head corresponds to a prepositional phrase, a relative pronoun is contained within the PP, as illustrated in (1)d:

(1)   a.   Il   bambino   che ⟨___⟩   accarezza   la   mamma          Subject relative
           the  boy          that             hugs           the  mother

      b.   Il   bambino   che   la   mamma   accarezza ⟨___⟩          Object relative
           the  boy          that   the  mother   hugs

      c.   Il   bambino   che – accarezza ⟨__⟩   la   mamma          Object relative with
           the  boy          that   hugs             the  mother          post-verbal subject

      d.   Il   bambino   con   cui/il quale   la   mamma
           the  boy          with   whom          the  mother

           sta   parlando ⟨___⟩                                         PP/Indirect
           is    talking                                                object relative

The dependency holding between the relative head and the corresponding gap within the relative clause is best characterized as a movement dependency, along the schematic lines in (2),[1] in which the relative head moves into a dedicated left peripheral

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position within the CP; for concreteness, the derivation is illustrated through a raising analysis of relative clauses (Bianchi 1999; Kayne 1994; Friedmann, Belletti & Rizzi 2009; Rizzi 2004a for further details). As the discussion of the present chapter will concern Subject and Object relatives of the type in (1)a and (1)b, the illustration refers to these sentences:

(2)   a.   (…) [Il bambino [che ⟨___⟩   accarezza la mamma]] (…)   Subject relative

   b.   (…) [Il bambino [che la mamma accarezza   ⟨___⟩]] (…)   Object relative

In several varieties of Italian (and in dialects spoken in Italy), relatives are often realized with a resumptive pronoun rather than a gap within the relative clause. In Italian, resumptive relatives typically belong to an informal somewhat substandard register;[2] normatively, they are not considered "correct", although they are fairly common in colloquial speech.[3] The resumptive pronoun is a clitic pronoun. As there are no subject clitics in standard Italian, subject resumptive relatives are not distinguishable from subject gap relatives, as the resumptive pronoun should correspond to a null subject *pro*, the silent equivalent of a weak subject clitic (Cardinaletti & Starke 1999). Object relatives, in contrast, contain an accusative object clitic within the relative clause, corresponding to the relative head as illustrated in (3) (relative head and clitic are co-indexed for clarity):

(3)   Il   bambino$_i$   che   la   mamma   lo$_i$   accarezza ⟨___⟩
      the   boy           that   the   mother   him$_{cl}$   hugs

———————————————

CP (Rizzi 1997) the relative head noun phrase of the relative clause within its specifier. For recent version of the raising analysis see Cecchetto & Donati (2011). A detailed discussion of the precise analysis of restrictive relatives and the comparison between the so called matching and raising analyses is beyond the scope of the present chapter, as it would take the discussion too far afield (cf. Cinque 2013). Any analysis would anyway involve the creation of a long distance A' dependency, along the lines schematized in (2). For the sake of simplicity, it is assumed in (2)a that in subject relatives movement of the subject occurs from the preverbal subject position (see Footnote 30, Example (40) for a more precise representation; nothing hinges on this particular assumption here).

**2.**   Whereas in dialects relativization through resumption may be the only relativization strategy.

**3.**   Depending on the variety of Italian, the register may be considered more or less informal. In varieties which are strongly influenced by the close dialect, resumptive relatives may be considered fairly standard. This may be the case for the varieties of Italian spoken in Veneto. However, "standard" relatives in Italian are gap relatives.

In indirect relatives, the clitic within the relative clause, corresponds to the relevant indirect clitic (if it exists, e.g. Il bambino che la mamma gli dà un bacio ⟨__ ⟩//The kid that the mother gives a kiss to-himcl; /Il bambino che la mamma ne parla sempre ⟨___⟩//The kid that the mother always talks of-himcl). As will be discussed later in the chapter, children often produce resumptive relatives, for both direct and indirect object relatives (Guasti & Cardinaletti 2003).

Various analyses can be proposed for resumptive relatives. Sometimes it is assumed that resumption is the signature of a derivation not involving movement (e.g. within the literature on atypical development Friedmann & Costa 2011). Alternatively, resumptive relatives can be assumed to involve a doubling-type derivation, in which the relative head and the clitic are merged within the same "big DP" (Cecchetto 2000; Kayne 2005; Belletti 2005)), the relative head undergoes movement into the dedicated left peripheral position within the CP as in (2), and the clitic is stranded inside the relative clauses.[4] The essential features of this derivation, which will be assumed here for concreteness, are schematically illustrated in (5):

(5)    (…) [Il bambino$_i$ [che la mamma lo$_i$ accarezza [$_{DP}$ ___ ___ ]]] (…)
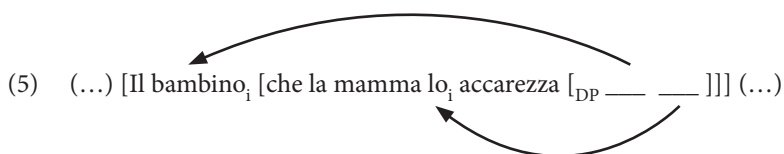
Summarizing, the derivation of relative clauses in Italian involves the creation of a long distance (movement)-dependency holding between the relative head filling a dedicated position within the left peripheral CP, and the corresponding gap within the relative clause; the dependency of resumptive relatives holds between the relative head and the corresponding clitic. From the point of view of the interpretation, the interpretive function of a restrictive relative clause is to restrict the set of referents about which the relative clause predicates some property. Clearly, relative clauses are complex structures overall, as even this brief description of the Italian case suggests.

Thus, it is no surprise that relative clauses have been identified in the acquisition literature as some of the hardest structures to acquire, in the different languages studied over a long period of time (Friedmann & Novogrodsky 2004; Håkansson & Hansson 2000; Mc Kee et al. 1998; Tavakolian 1981, a.o.). Some relative clauses are properly

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4.    Hence, according to this view, resumptive relatives are special instances of clitic doubling. The analysis briefly described in the text owes a lot to the influential analyses of quantifier floating and of cliticization of Sportiche (1988, 1996); Belletti (2005) for discussion. It captures both the movement properties of cliticization and relativization and the apparent lack of movement suggested by the presence of the clitic in the position in which a gap would be expected if the moved phrase were the entire DP.

understood rather late in the course of typical development. A crucial difference is observed between Subject relatives, acquired earlier and with no special difficulty by young children already around age 3 and a half, and Object relatives, acquired much later, after age 5. This asymmetry is long lasting, as it is still observed in adults' comprehension, as revealed by studies on adult parsing (Footnotes 18, 23). In atypical development, the proper acquisition of Object relatives is also, not surprisingly, hard as revealed by studies on Italian SLI children and in other forms of atypical development. This chapter reviews some of the fundamental results on the acquisition of Italian relative clauses, whose study has received a lot of attention in recent years and has given rise to an especially productive synergy between experimental work and theoretical elaboration. We briefly outline below the basic features of the theoretical account that we will assume in this chapter.

The theoretical account in the interpretation of the source of the complexity of (headed) object relatives will be in terms of intervention.[5] Informally put for now, a crucial property in the derivation of a headed Object relative containing a lexical subject (in the preverbal position) is that an intervention situation is necessarily created, as is clear from the schemas in (2)b and (5) above: the lexical subject intervenes in the structure in the establishment of the long distance dependency between the relative head and the position in which it is originally externally merged within the relative clause (gap). (6) schematizes the intervention situation (the merge position of the relative head is indicated by its copy with ⟨ ⟩):

(6)    R DP    [ *DP/S*………… ⟨ DP⟩]

In Section 4 the theoretical account in terms of locality and intervention will be elaborated in detail.

The chapter is organized as follows. We start out by reviewing results from production studies (Sections 2.1 through 2.4), moving then to comprehension studies in typical development (Sections 3 through 3.1.2). The theoretical interpretation of the emerged developmental path will be presented in Section 4 (4-4.3). A review in Section 5 of some results from forms of atypical development, from SLI, to hearing-impaired children, to autistic children and children with developmental dyslexia/DD will conclude the overview. Section 6 summarizes the findings and concludes the chapter with some considerations for future research.

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**5.** See also Chapter 4 and Chapter 6 for the analogous interpretation in the analysis of passives and wh-questions.

## 5.2 Production

### 5.2.1 The production of subject and object relatives in typically developing children

A number of works have addressed the acquisition of relative clauses in typically developing monolingual Italian-speaking children from the point of view of their ability to produce a Subject or an Object relative in an experimental situation of elicitation. The cross-linguistic acquisition literature has characteristically concentrated on the comparison between the acquisition of these two types of restrictive relatives, where the object is a direct object (not a prepositional object); Italian studies are no exception (but see Guasti & Cardinaletti 2003 on prepositional relatives). Overall, all results have shown a significant difference between the relatively smooth early production of Subject relatives, which contrasts with the significantly harder and later capacity to produce Object relatives.

A first pilot study (Utzeri 2007) adapted for the first time to Italian the elicitation procedures designed in Novogrodsky & Friedmann (2006), which consisted of a Preference Task (PT) and a Picture Description Task (PDT). In the Preference task, children were asked to choose between two boys or two girls involved in two different situations described by the experimenter by saying which child of the two they would prefer to be. In the Picture description task, the child had to continue with the description of a picture introduced by the experimenter; the situation depicted in the pictures was such that the production of either a Subject or an Object relative was expected.[6] As the Preference Task has then been utilized in several other experiments to be presented below, which have adapted the design to Italian in a more articulated and controlled

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6. In the PDT adapted from Novogrodsky and Friedmann (2006), two pictures are presented, one showing one character performing an action over another character, the other showing the reverse situation. The experimenter describes the first picture and then asks an eliciting question as in i a, b for subject and object relatives respectively:

   i.  *Experimenter: In these pictures, there are two rabbits. In one picture, the rabbit is pushing the penguin and in the other picture the penguin is pushing the rabbit. Which rabbit is this (pointing to the first picture)? Start with "This is the rabbit…."*

   a.  Target SR: Il coniglio che spinge il pinguino
         "The rabbit that is pushing the penguin"
       *Experimenter: And now which rabbit is this (pointing to the second picture)? Start with "This is the rabbit."*

   b.  Target OR: Il coniglio che il pinguino spinge
         "The rabbit that the penguin is pushing"

way than in the pilot, we only report here the basic results from the first running of the experiment given their significance. We will then move to the subsequent studies. Consider an example of the exchanges and of the expected elicited relatives:

1.

Experimenter: Ci sono due bambine. Una bambina sta leggendo una storia, l'altra bambina sta ascoltando una storia. Quale bambina preferiresti essere? Inizia con "(Preferirei essere) la bambina …

There are two girls. One girl is reading a story, the other girl is listening to a story. Which girl would you rather be? Start with "I would rather be the girl….

Target answer *Subject relative*:
(Preferirei essere …)

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| La | bambina | che ___ | sta | leggendo | una | storia |
| The | girl | that ___ | is | reading | a | story |

2.
Experimenter: Ci sono due bambine. La mamma sta baciando una bambina, il nonno sta baciando un' altra bambina.

Quale bambina preferiresti essere? Inizia con "(Preferirei essere) la bambina …
There are two girls. The mother is kissing one girl, the grandfather is kissing the other girl. Which girl would you rather be? Start with "I would rather be the girl….

Target answer *Object relative*:
(Preferirei essere…)

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| La | bambina | che | la | mamma sta | baciando ___ | |
| The | girl | that | the | mother is | kissing ___ | |

The Preference Task has two conditions: a Verb change condition, of which (1) is an illustration (for a Subject relative) and a Subject change condition, of which (2) is an illustration (for an Object relative; for the elicitation of a Subject relative the change affects the object in the relative). There were 41 school age children tested (age range: 6–11), and 30 adults (age range: 15–73). The overall results for children are the following:

> Subject relatives: out of 649 elicited Subject relatives, children produced 1156 Subject relatives
>
> Object relatives: out of 649 elicited Object relatives, children produced 144 Object relatives

This is a striking and huge difference. It clearly shows that it is hard for children to produce Object relatives; there is no comparable difficulty with the production of Subject relatives, which have also been produced in place of an Object relative in a significant proportion (whence the big number of subject relatives produced).

The first pilot study had various limits, the most important one being the lack of a careful analysis of the data divided per age; subsequent studies have corrected this limitation and have also investigated the production of relatives in younger children, as will be discussed below. However, this first pilot adaptation to Italian of the Preference Task has also an important merit: it is the first study, which has discovered for Italian that children in the age range analyzed tend not to produce Object relatives, and rather prefer to transform the target Object relative into a Subject relative, without misinterpreting the task. Indeed, children adopted various strategies, such as changing the verb of the relative clause in such a way that the intended meaning would still be preserved. This is the case illustrated in (5); in (5a) we have the sentence produced by the child and in (5b) the expected response.

(5)  a.  Il bambino che riceve un bacio dalla mamma
         the child that receives a kiss from the mother

     b.  Il bambino che la mamma bacia
         the child that the mother kisses

The most important strategy adopted in order to produce a Subject relative in place of an Object relative still preserving the intended meaning, however, is through use of Passive: it is the first time that this production strategy has been systematically documented as being widely adopted in Italian. Some resort to passive when an object relative was elicited had also been reported in Guasti and Cardinaletti (2003), where a different elicitation design adapted to Italian from Hamburger and Crain (1982) was utilized. In the pilot results reported here, a widespread resort to Passive when an Object relative was elicited has been shown to be even stronger in the productions of the group of adult controls. Let us refer to the Subject relatives in the passive when an Object relative is elicited as Passive Object Relatives (Belletti 2014; Contemori & Belletti 2013), sometimes abbreviated as POR. Thus, the overall group of 41 children produced Passive Object Relatives in 36% of the cases, i.e.: *il bambino che è pettinato dalla mamma* (the child that is combed by the mom) in place of *il bambino che la mamma pettina*; in 23% of the cases children used a *si*-causative type of structure (cfr. Chapter 4), e.g. *il bambino che si fa pettinare dalla mamma*, again in place of *il bambino che la mamma pettina*. Hence, overall, the group of children produced Passive Object Relatives in 59% of the cases. The overall group of adults did so at a much higher rate, in 93% of the cases. In other words, adults essentially did not produce (active) Object relatives in the elicitation conditions, but produced Passive Object Relatives, instead. These findings have been confirmed in various other studies, which have also considered children of younger ages; this has in turn made it possible to address the study of the emergence of use of Passive Object Relatives in development. We now turn to these studies.

Belletti and Contemori (2010) readapted to Italian the Preference test just described from Novogrodsky & Friedmann (2006)[7] and tested the children's production of Subject and Object relatives starting at a younger preschool age. Forty-eight Italian-speaking children aged 3;4–6;5 participated in this study. Contemori and Belletti (2013) is a further extension of this study to a wider population of 97 Italian- speaking children aged 3;4 up to 8;10 (thus adding children older than 6;5 already present in the first study). This second study also contains an adaptation of the Picture Description Task. The main features of these studies are reported here and in 2.2, 2.3 below.

The Preference Task elicited the production of Subject relatives and of Object relatives along similar lines as those described above for the first pilot experiment. In a first Study, 10 Subject and 10 Object relatives were elicited. Both the subject and the object of the relative clause were singular, under a verb change condition and an object or subject change condition; active clause were both singular, under a verb change condition and a subject change condition. In the first study, 6 items were added (3 in the subject change condition and 3 in the verb change condition) in the elicitation of Object relatives in which the subject of the relative clause was plural in number; this was done in order to avoid the ambiguity which may arise in the number match condition in Italian, illustrated in the relative clause in (5):

(5)   Vorrei essere il bambino che accarezza la mamma
       I would rather be the child that hugs the mother

(5) can be interpreted either as a Subject relative with the post-verbal noun phrase being the direct object of the verb of the relative clause, or it can be interpreted as an Object relative with the post-verbal noun phrase being the post-verbal subject of the relative clause, as in (1)c of the introduction. The ambiguity of sentences like (5) comes from the grammatical possibility in Italian of admitting lexical subjects in post-verbal position. The intrinsic ambiguity of sentences like (5) makes it hard to evaluate the results of the elicitation task in the case of Object relatives. Children's productions as in (5) may be evaluated as errors in which the child has produced a Subject relative instead of the expected Object relative, or else they can be evaluated as correct productions in which the child has made use of a post-verbal subject. As use of a post-verbal subject could be appropriate under the discourse conditions of the elicitation situation (especially under the subject change condition),[8] the proper evaluation of similar

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7.   Analogous adaptation has been done for a number of other languages under the COST/A33 project. Friedman et al. in prep. for the report of the crosslinguistic results.

8.   There are two children. The doctor examines one child, the nurse examines the other child. Which child would_ you rather be? Start with "I would rather be the child…"

Target: Vorrei essere il bambino che il dottore/l'infermiera visita

or

productions by children is simply impossible. Since children can produce post-verbal subjects from early on – with production increasing at age 5, as reported in Belletti & Contemori 2010 – whether productions of sentences like (5) should be interpreted as target Object relatives or as non-target Subject relatives remains a necessarily arbitrary decision left to the experimenter's judgment. The only clear Object relatives produced under the matching condition are those in which the lexical subject is preverbal as in (6), those in which the child utilizes a resumption relativization strategy, in which the relative clause contains a resumptive clitic pronoun corresponding to the relative head, as in (7), or else, possibly, also a non-target resumptive relative in which the resumptive element is a full noun phrase, corresponding to the relative head as in (8), a strategy which is known cross-linguistically to be resorted to especially by young children:

(6)  Il bambino che la mamma accarezza ____
     the child that the mother hugs ____

(7)  Il bambino che la mamma lo accarezza ____
     the child that the mother him-$_{cl}$ hugs ____

(8)  Il bambino che la mamma accarezza il bambino (or: quel bambino; quell'altro bambino…)
     the child that the mother hugs the child (or: that child; that other child)

The most reasonable conclusion that can be drawn from these considerations is that some ambiguous productions by children are indeed target productions containing a post-verbal subject whereas some are in fact non target subject relatives with a direct object following the verb of the relative clause. Belletti and Contemori (2010) provide two calculations of the relatives produced by children when an Object relative was elicited: one including both the (irresolvable) ambiguous productions and the unambiguous ones, and one only counting the unambiguous Object relatives. In both cases, the production of Subject relatives (SR) is generally significantly higher than the production of Object relatives (OR). In a second run of the experiment the other possible mismatch condition for OR has been implemented, in which the head of the relative clause is plural and the subject is singular. Also in this study, the production of OR is significantly lower than the production of SR in all age groups. A summary of the results presented is given in Table 5.1, derived from Belletti & Contemori (2010):

The production of Object relatives seems to be rather high in the first three groups under the Singular head/Subject (and verb) singular or plural condition (up to 85.7),

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Vorrei essere il bambino che visita il dottore/l'infermiera_/("I would rather be the child that the doctor/nurse examines… or… that examines the doctor/the nurse").

**Table 5.1.** Percentages of Subject and (ambiguous if nothing is indicated and unambiguous, marked with Unam) Object relatives with Singular (Sing) and Plural (Pl) head (H) produced by the 48 children (adapted from Belletti & Contemori 2010)

|    |            | 3;4–3;11 | 4–4;11 | 5–5;11 | 6–6;5 |
|----|------------|----------|--------|--------|-------|
| SR | SingH      | 72.9     | 93.6   | 91.4   | 95.7  |
|    | PlH        | 60.8     | 90     | 84.7   | 88.6  |
| OR | SingH      | 76.5     | 85.7   | 71.8   | 59.8  |
|    | PlH        | 51.6     | 65.7   | 60     | 55.7  |
|    | UnamSing H | 36       | 52     | 42     | 37.5  |
|    | UnamPl H   | 39       | 52     | 49     | 53    |

including number match items (first raw, mainly).[9] This result is clearly affected by the inclusion in the counting of the ambiguous productions as it is also suggested by the much lower score in the number mismatch condition (second raw). Interestingly, when only clearly unambiguous Object relatives are considered, the percentages of target productions is even lower. This is expected in particular in the case of the Singular head condition, as the ambiguity problem triggered by the number match condition is factored out.[10]

### 5.2.2   The production of Passive Object Relatives in children

In their larger study, Contemori and Belletti (2013) concentrated on the production of ORs just taking into consideration unambiguous ORs and a larger group of 3;4–8;10 children. This work is in line with the results just summarized in the previous section; the interesting finding reported in Contemori and Belletti (2013) is the high recourse to the production of a POR instead of the elicited OR, particularly significant in the oldest group of children. Contemori and Belletti (2013) report that, as children grow older, use of passive in the relative clause increases as a way to respond to the

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**9.**   Recall that 10 items contained the match-condition Singular head/Subject singular and only 6 the mismatch condition Singular head/Subject plural. Thus, the amount of potentially ambiguous ORs is higher than the potentially unambiguous ones. Moreover, sometimes children changed the number of the subject (and agreeing verb) in the relative clause, which lead to the re-establishment of a match-condition. This happened both in the SingH and in the PlH batteries, which is the main reason why there are in fact also some ambiguous relatives in the PlH battery, although to a smaller extent. On the change of the subject number see the discussion in Belletti & Contemori (2010) who interpret it (at least in part) as cases of number attraction from the relative head. See also Chapter 6 for the similar phenomenon in wh-questions.

**10.**   The lower score in the PLH condition in both SR and OR suggests that processing plurality may be harder for children anyway. See Chapter 1 on verbal inflection for relevant considerations

elicitation of an OR, with the production of different types of passives in the POR as those in (9):[11]

(9)   a.   "si fa"- causative:   Il bambino che si fa pettinare dalla mamma
                                 the child that SI-makes comb by the mother

       b.   copular:            Il bambino che è pettinato dalla mamma
                                 the child that is combed by the mother

       c.   reduced:            Il bambino pettinato dalla mamma
                                 the child combed by the mother

This is interestingly revealed by the growing number of children responding with a POR in the two groups of comparable size of the 6 and the 8 year olds, illustrated in the following Table 5.2:

**Table 5.2.** Recourse to passive in the relative clause yielding to production of POR when OR is elicited

| Age groups | Number of participants | Participants producing PORs |
| --- | --- | --- |
| 6–6;11 | 23 | 8 |
| 8–8;11 | 22 | 16 |

     This result is also in line with the conclusion in Belletti & Contemori (2010) in this respect, summarized by the following graph discussed in Belletti (2012), based on (a smaller group of) children up to age 6:11.

     The increase in the use of passive in the relative when an OR is elicited is also found in Guasti et al. (2012)a in which a different elicitation technique had been used modeled after the classical design in Hamburger and Crain (1982) and Crain and Thornton (1998). Two different groups of children had been tested in this study, aged 5 and 9; recourse to POR is found in both groups, but significantly more in the older group (see also Chapter 6, Section 4 for similar trends in wh-questions).

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**11.**   Young children start with the production of passive sentences like (9)a with a "si fa"-causative passive, whereas adults prefer sentences like (9)c with a reduced passive. No "si fa"-causative passive in adults' production were observed, and no reduced passive in young children's productions were found. See below for more discussion. A developmental path has probably been identified through these results on the acquisition of passive, discussed in Manetti & Belletti (2014). See also Chapter 4. Lack of reduced PORs in children suggests that these structures are in fact complex; this aspect of children's behavior does not support an analysis of PORs as involving adjectival types of passive, allegedly easier for children (Chapter 4).
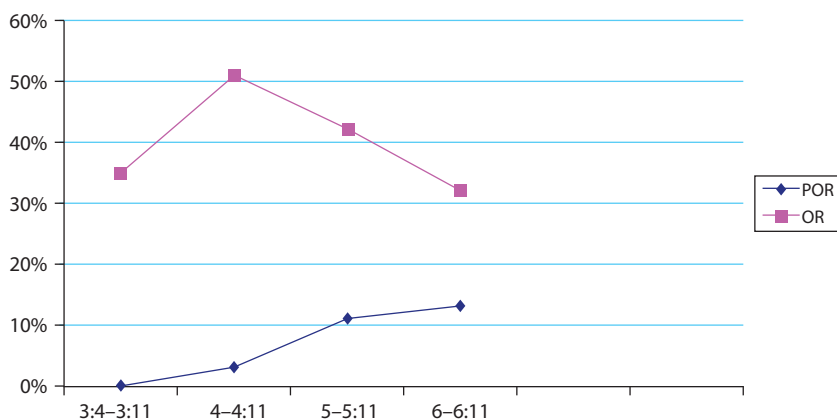
**Figure 5.1.** Development of production of ORs and PORs in a group of children from 3;4 to 6;1[12]

### 5.2.3 The production of Passive Object Relatives in adults in comparison with children of different ages

When exposed to the same elicitation task through the Preference test, Italian speaking adults tested in Belletti and Contemori (2010) and, with a bigger group, in Contemori & Belletti (2013) made an extreme recourse to use of PORs. In fact, only between 3% and 10% of the elicited ORs were actually produced in the target way. The rest were all PORs.

Although the experimental setting may turn out to be in some way critical in providing a reason for the described adults' and related children's behavior in a way which is yet to be understood, still this behavior cannot be simply considered a task-related effect. As discussed in Contemori and Belletti (2013), use of a POR, instead of an OR, also shows up with a different type of task, a Picture Description Task (adapted from Novogrodsky & Friedmann 2006); the shape of the results is the familiar one with older children making increasing use of PORs as a reaction to the elicitation of an OR, reaching 73% in the age range 8–8;10. The fact that, as mentioned in the previous section, Guasti et al. (2012)a also found a larger resort to passive in the relative in the

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12.  When passive becomes fully productively available, resort to POR by children increases and the production of active object relatives, which is present in a limited amount in young children (see also Table 5.1), decreases. Hence, older children do not struggle anymore for the production of (active) object relatives as they do at the young ages, with very limited success though (Table 5.1). See Belletti (2012) for further discussion on this point, addressing the issue of the comparison between the complexity of the computations involved in passive and in object relatives. See also below for further relevant considerations.

older group of the children they tested with a totally different technique confirms that we are not faced with a task related effect.

Belletti and Chesi (2011) tested a different group of Italian speaking adults with an adaptation of the same Preference task in which the animacy feature of the relative head and of the subject of the relative clause was manipulated. The research question was whether manipulation of animacy could favour the production of an OR, in particular in the mismatch in animacy condition between the relative head and the subject of the relative clause (e.g. relative head [−anim], subject of the relative [+anim]). The results clearly indicated that preference to resort to a POR was maintained also under this manipulation. Thus, although adults are able to process ORs in Italian, under the experimental conditions they went clearly for the production of a subject relative in the passive, i.e. a POR. This confirms that the behavior shown by children goes in fact toward an approximation to the adults' behavior, as suggested in 2.2.[13]

The research question whether mismatch in animacy between the relative head (inanimate) and the subject of the relative clause (animate) plays some facilitating role in favouring the production of an OR was also tested in Guasti et al. (2012)a. The main result in this study showed that mismatch in animacy appears to be of some help for the younger children tested aged 5, but not for the older ones, aged 9, who prefer to opt for a POR. This is also consistent with the finding reported from Belletti and Chesi (2011) who did not find any animacy effect in the group of adults tested through the Preference task. Thus, animacy appears to be a feature which may be taken advantage of in the early stages of development, but which is not directly relevant, at least as far as production is concerned, in the mature computational system. Thus, older children not only appear to be closer to adults in their increasing resort to passive and PORs, but also in their decreasing sensitivity to the animacy feature.

### 5.2.4    The position and nature of the subject in the object relatives produced by children

Although, as we have discussed, the production of OR by children is rather limited in the experimental conditions tested, some OR are produced by them. Belletti and Contemori (2012) have studied children's productions of ORs according to the position – pre- or post- verbal – and nature – overt or null pronominal – of the subject of the relative clause. As for the position, the results from the Preference Task of the study presented in 2.1 have already indicated children's ability to locate the subject in the post-verbal position and use it in the appropriate discourse conditions (typically

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**13.**    As discussed in Belletti and Chesi (2011), use of a POR is not due to the frequency of these type of structures in the input, which are in fact even rarer than active object relatives in the Italian corpora studied. See Section 4.3 for more on this study.

as the focus of new information) from early on, with an increase of production of post-verbal subjects over pre-verbal ones around age 5. The production of both pre- and post- verbal subjects then decreases, as past this age the production of POR starts growing, as discussed, and the issue of the location of the subject does not arise anymore: the external argument is expressed with the by-phrase, if overt; its discourse value can be the same as that of a post-verbal subject, focus of new information.

All in all, children are adequate in the processing of overt lexical subjects in the production of the OR, when they are produced, which is, we recall, a small amount, both in absolute and in comparison with SR. In some cases, in particular under the verb change condition of the experiment, the subject of the relative clause could be interpreted as given; thus, leaving it unpronounced was a felicitous reaction to the elicitation question. Again, children did not show any problem in the production of null subjects in these conditions.

A further new research question is addressed in Belletti and Contemori (2012) with children aged 3 to 7;11, which crucially hinges on the status of the subject of an object relative clause: lexical DP or pronoun. Recall that, given the null subject nature of Italian, a pronoun can be null or overt, according to whether it counts as given or as new information. In the version of the Preference Task discussed so far, the subject of the relative clause was always a lexical noun phrase; under the new design the subject was always a pronoun, either overt as or null as in (10) eliciting the two possible answers in (11) and (12) respectively; it is either 1st or 3rd person as is illustrated in (13)a, b (the head of the relative was inanimate; given the conclusion of the previous Section 2.3 although this factor may play some role, it is probably not crucial, see below).

(10)   Experimenter:   Cʼè un bambino e ci sono due panini. Un panino lʼha ricevuto e un panino lʼha preparato lui. Secondo te il bambino quale panino vorrà mangiare per primo?

"There is a boy and there are two sandwiches. The boy received one sandwich and he prepared the other sandwich. Which sandwich do you think he would like he would like to eat first?"

Possible target answers (depending on which Verb the child prefers):

Verb [– S][14]

(11)   Vorrà mangiare il panino che *pro* ha ricevuto
He will want to eat the sandwich that pro has received
"He will want to eat the sandwich that he received"

---

14.   The notation Verb [–S]/Verb [+S] refers to the absence/presence of the overt pronominal subject in the introductory eliciting story.

Verb [+ S]

(12)  Vorrà mangiare il sandwich che *pro* ha fatto lui
      He will want to eat the sandwich that pro has prepared he
      "He will want to eat the sandwich that he prepared"

(13)  a.

Experimenter:  Ci sono due palloni. Un pallone l'hai comprato e un pallone l'hai vinto
               al Luna Park. Con quale pallone vorresti giocare?

               "There are two balls. You bought one ball and you won the other ball at
               the Luna Park. With which ball would you like to play?"

Target answer:  (Vorrei giocare con Il pallone/Quello) che *pro* ho comprato/vinto
                "(I would play with the ball/the one) that I bought/won"

(13)  b.

Experimenter:  Cʹè una bambina e ci sono due canzoni. Una l'ha sentita alla televisione e
               l'altra      l'ha imparata a scuola. Secondo te la bambina quale canzone
               vorrà cantare?

               "There is a girl and there are two songs. The girl heard one song on the
               TV and she heard the other song at school. Which song do you think
               she would like to sing?"

Target answer:  (Vorrà cantare La canzone/Quella) che *pro* ha sentito a scuola/alla
                televisione

                "(She would sing the song/the one) that she heard at school/on the TV."

Details aside, the most relevant result in this version of the elicitation experiment through the Preference Task is that children showed no special problems in the production of the elicited OR, from the youngest ages, both with 1st and with 3rd person either overt or null subject. They also showed a very good mastery of the discourse conditions. A summary of the relevant results is given in Table 5.3.

Table 5.3a, directly taken from Belletti and Contemori (2012), indicates the appropriate use by children of all ages of post-verbal and null subjects: only in the Verb[+S] condition use of a post-verbal subject is felicitous in the OR (ex (12)) and post-verbal subjects are virtually absent in the Verb[−S] condition;[15] reciprocally, only a null subject is appropriate in Verb [−S] condition, and indeed null subjects are virtually the sole choice made by children, from the very young group on. But let us now concentrate on the values in Table 5.3b, adapted from the same article. The results here are in sharp contrast with the results seen so far in the previous sections, according to which ORs are hard for children, and so they are hardly produced. Table 5.3b shows that in

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**15.**   See Crain et al. 1990 for comparable young children data from Italian showing proper mastery of post-verbal subjects. See also Chapter 7 for a general overview on the acquisition of subjects.

**Table 5.3a.**  Raw figures and percentages of overt post-verbal or null pronominal subjects produced when the introductory story contained the pronominal subject, divided according to the target choice made by children (from Belletti & Contemori 2012)

| Verb [+ S] | 3–3;11 | 4–4;11 | 5–5;11 | 6–6;11 | 7–7;11 |
|---|---|---|---|---|---|
| Postverbal-S | 15/23 | 28/38 | 54/60 | 68/75 | 49/53 |
|  | 65% | 74% | 90% | 91% | 92.5% |
| Null-S | 8/23 | 10/38 | 6//60 | 7/75 | 4/53 |
|  | 35% | 26% | 10% | 9% | 7.5% |
| **Verb [–S]** |  |  |  |  |  |
| Postverbal-S | 3/49 | 5/76 | 5/61 | 2/78 | 1/49 |
|  | 6% | 7% | 8% | 3% | 2% |
| Null-S | 46/49 | 71/76 | 56/61 | 76/78 | 48/49 |
|  | 94% | 93% | 92% | 97% | 98% |

**Table 5.3b.**  Raw figures and percentages of ORs produced in the 1st and 3rd person condition out of the total of expected ORs (from Belletti & Contemori 2012)

| 1st **person** | 3–3;11 | 4–4;11 | 5–5;11 | 6–6;11 | 7–7;11 |
|---|---|---|---|---|---|
| OR | 77/110 | 117/140 | 121/140 | 148/160 | 104/110 |
|  | 70% | 83% | 86% | 92.5% | 94% |
| 3rd **person** |  |  |  |  |  |
| OR | 64/110 | 116/140 | 116/140 | 149/160 | 97/110 |
|  | 58% | 83% | 83% | 93% | 88% |

the version of the Preference Task in which the subject of the relative clause is pronominal, be it null or overt, ORs are produced by children, with no special difficulty.

Indeed, the crucial factor in making the children's performance good with these ORs seems to be the pronominal nature of the subject of the relative clause, in contrast with the version of the Preference Task discussed in 2.1 and 2.2 in which the head of the relative was a lexical noun phrase and the subject of the relative clause was also a lexical noun phrase (examples in (1)).[16] Recall that, as is also discussed in Guasti et al. (2012)a, children typically tend to make the relative head pronominal with use of the demonstrative pronoun "quello/quella", which is a natural choice in all the elicitation designs considered:

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**16.**    On the facilitating role of pronominal subjects also in adults see Gordon et al. (2004), Warren & Gibson (2005), and the discussion in Belletti & Rizzi (2013) and below.

(14)  Quello che i gatti rincorrono
      the one that the cats are chasing

As noted by the authors, although this occurs more with ORs, it also often happens in subject relatives, which suggests that, the pronominal nature of the relative head may not be a crucial factor in the OR case. As mentioned above, Guasti et al. (2012)a also note that use of an inanimate head ameliorates the performance of younger children (5 y.o.) in their groups, but not of the older ones (9 y.o.) for which the (in)animacy of the relative head appears to be uninfluential. Taken together with the results obtained with adults from Belletti and Chesi (2011), one may conclude that the fact that in the version of the Preference Task under discussion here the relative head was inanimate (see examples above), whereas it was mostly animate in the version discussed in the previous sections, should probably not be considered a crucial factor in enhancing children's performance. In conclusion, the major factor ameliorating/facilitating the production of object relatives here appears to be brought about by use of a pronominal instead of lexical subject in the relative clause, overt (and post-verbal given its status as focus of new information) or null. A note of caution is, however, in order here. The described design did not have a condition eliciting an overt pre-verbal pronominal subject, hard to create in a null subject language like Italian since a preverbal subject, which is a given/topic like subject, is typically realized as a null (pronominal) subject. Hence, we have here a confound: when the pronoun is overt it is also post-verbal. It would be most welcome to be able to tease apart in a new design the pronominal vs lexical nature of the subject and its overt vs null status. This project is yet to be implemented.

Data from Guasti and Cardinaletti (2003) confirm that children (age range 5;6–9;6) do produce post-verbal subjects in relatives also with lexical subjects with no difficulty. (15) is an example of one of the relevant children's productions in the relatives studied in that work, elicited through an adaptation to Italian of the original design from Hamburger and Crain (1982):

(15)  Tocca la panca che ci sono i due bambini         (7;2)
      touch the bench that there-CL are sitting the two children

Note, incidentally use of the clitic resumptive strategy in the indirect relative in (15). This is a fairly common strategy in children's speech, as noted in 2.1 also in the in production of (direct) object relatives, but especially so in indirect relatives. Guasti and Cardinaletti (2003) suggest that use of the relative pronoun, which should be used in indirect relatives – e.g. *Tocca la panca su cui sono i due bambini*/touch the bench on which are the two children, for Example (15) – is a very formal type of production, as relative pronouns are only found in indirect relatives in Italian (cfr. Examples in (1)); children probably only acquire it late, most likely through explicit teaching at school.

We now turn to the presentation of the results from comprehension.

## 5.3   The comprehension of subject and object relatives in typically developing children

Adani (2011), building on Adani (2008), tested the comprehension of SRs and ORs in Italian speaking children in the age range 3–7 y.o. Given the ambiguity of Italian relative clauses in which the relative head and the post-verbal noun phrase in the relative clause match in number described in 1/Example (1c), as the post-verbal noun phrase may be interpreted either as a direct object or as a post-verbal subject, Adani (2011) tested the comprehension of unambiguous relatives of the type in (16), in which the relative head (singular) and the noun phrase internal to the relative clause (plural) mismatch in number. The relative clauses are right branching relatives in which the relative head is the object of the matrix clause and the noun phrase in the relative clause can be either the subject (relative = SR, abbreviated as OS) or the object of the relative clause (relative = OR, abbreviated as OO); the noun phrase in the relative clause can be found in the post-verbal position and is interpreted as a post-verbal subject (relative = OR, abbreviated as OOp), as is unambiguously indicated by the plural verbal agreement:

(16)   a.   Indica il gatto [che sta bagnando le rane].                    (OS)
            Point to the cat that is wetting the frogs

       b.   Indica il gatto [che le rane stanno bagnando].                 (OO)
            Point to the cat that the frogs are wetting

       c.   Indica il gatto [che stanno stanno bagnando le rane].          (OOp)
            Point to the cat that are wetting the frogs
            Point to the cat that the frogs are wetting

This work uses the same experimental technique and pictures utilized in De Vincenzi et al. (1999) to test subject/object wh-questions; in this methodology a single picture with two possible referent choices is presented to the experimental subjects.[17] See (17) for a sample of the pictures used:
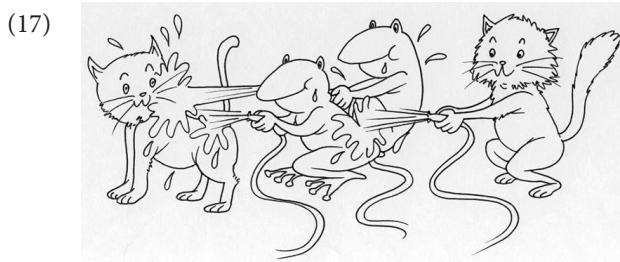
(17)


**Figure XX.**  Example of material used in Adani (2011)

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17.   This is done in order to avoid a number of potential confounds that have been sometimes claimed to possibly arise. E.g.: choice between two distinct pictures, often utilized in the majority

The main features of the results have indicated that:

– SR/OS: are the best understood at all ages, up to 91% in the youngest age group 3;4–3;11
– OR/OO: are understood at chance (53%) at the youngest age group 3;4–3;11; then, the comprehension increases (up to 83% at age 4–4;10; 74% at age 5–5;11; 85% at age 6–6;11; 89% at age 7–7;9)[18]
– OR/OOp: are poorly understood at all ages (36% at age 3;4–3;11; 59% at age 4–4;10; 54% at age 5–5;11; 55% at age 6–6;11); only the oldest group reaches a good comprehension in this condition (70%, age range 7–7;9).

The overall results are consistent with the general finding across languages that SRs are better comprehended than ORs and that the comprehension of the latter structures improves with age. The results specifically also clearly illustrate that the OOp condition is the hardest to parse. Thus, the processing of a post-verbal subject appears to significantly increase the difficulty of the parsing of the (already) complex Object relative structures.

In a Picture selection task Arosio et al. (2009) tested the comprehension of subject and unambiguous object relatives in partly older children (139) aged 5, 7, 9, 11. They tested the comprehension of unambiguous ORs in two conditions: in a number match condition between the relative head and the subject of the relative clause in preverbal position (18c); in a number mismatch condition with the subject in post-verbal position (18b). The types of sentences utilized are given in (18):

(18)  a.  Fammi vedere il cane che insegue i cavalli          **SR**
          Let-me see the dog that chase3g the horses
          "Show me the dog that is chasing the horses"

      b.  Fammi vedere il cane che inseguono i cavalli        **OR**: AGREEMENT
          Let-me see the dog that chease3pl the horses
          "Show me the dog that the horses are chasing"

      c.  Fammi vedere il cane che il cavallo insegue         **OR**: POSITION
          Let-me see the dog that the horse chease3sg
          "Show me the dog that the horse is chasing"

The results found the familiar clear subject/object asymmetry with SRs comprehended better than ORs. The authors also found that ORs disambiguated through the position

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of works, may be sometimes considered pragmatically infelicitous (although not necessarily); selection among four possible choices instead of two etc. may end up being too complex etc. The reader is referred to Adani's paper for an illustration of the methodological issues.

**18.**  The method used seems indeed to be effective in providing optimal condition to enhance children's comprehension, as shown by the good performance at age 4–4;10.

of the subject as (18)c were better comprehended than ORs disambiguated through number agreement. The authors interpret this difference in terms of real time parsing as due to the later stage at which the checking of morphosyntactic agreement features is performed compared to the early assignment of thematic roles: Under the assumption that the parser tries to close the dependency of the relative head as soon as possible, the first analysis at the complementizer is always a SR interpretation (coherently with the results found with wh-questions in De Vincenzi 1991). In ORs with a preverbal subject, the noun phrase in the relative can be immediately associated its Theta-role as the External argument due to its position in the clause so that the reanalysis can be quickly performed together with the correct theta-role assignment; in contrast, verbal agreement with the post-verbal subject implies that reanalysis takes place once Theta-roles assignment has already taken place. Hence, in these structures, reanalysis takes place later and they are consequently the hardest structures to comprehend.

Contemori and Belletti (2013) have tested the comprehension of ORs of the two types found in children's (spontaneous and elicited) production, though to a limited extent as discussed, i.e. with a gap and with a resumptive pronoun (19a, b). They have then compared the comprehension of both these structures with the comprehension of different types of PORs also found in children's production (especially in the experimental conditions eliciting the production of object relatives described in 2.1, 2.2; 19c–e). Children were aged 6–8;10, namely they were all within an age span in which passive is known to be mastered relatively well by children, as was also indicated by the increasing use of PORs in their (elicited) production (see 2.2). (19) summarizes the sentence types tested:

(19)   a.   Mostrami la bambina che la giraffa lava          **OR – gap**
             Show me the girl that the giraffe is washing

       b.   Mostrami la bambina che la giraffa *la* lava     **OR – resumptive clitic**
             Show me the girl that the giraffe is washing her-CL

       c.   Mostrami la bambina che si fa lavare dalla giraffa   **POR – "si fa"-caus**
             Show me the girl that SI-makes wash by the giraffe

       d.   Mostrami la bambina che è lavata dalla giraffa   **POR – copular**
             Show me the girl that is washed by the giraffe

       e.   Mostrami la bambina lavata dalla giraffa         **POR – reduced**
             Show me the girl washed by the giraffe

The test was run through a binary Picture matching task,[19] using pictures of which (20) is an illustration:

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19.   Kindly made available by Naama Friedmann and used in several other studies by various authors as well.

(20)



The aim of this comprehension test was to determine whether (and from which age) children comprehend those relatives that they appear to master, to different extents, in production, i.e. different types of Passive Object Relatives/PORs and ORs with gap and with resumptive clitic. The most relevant aspect of this comprehension experiment is its comparative dimension both between production and comprehension and between active ORs and (types of) PORs. The results are summarized in Table 5.4. They clearly indicate a major divide: active ORs either with gap or with resumptive clitic are significantly harder to comprehend than any type of POR, which are well comprehended at all ages tested; with POR with "si-fa caus" passive as those which are best understood. These results are consistent with those from production and indicate that indeed, children comprehend what they also produce.

**Table 5.4.** Percentages of relatives correctly comprehended by children (adapted from Contemori & Belletti (2013)

|  | 6;5–6;11 | 7–7;11 | 8–8;10 |
|---|---|---|---|
| OR – gap | 63 | 64 | 64 |
| OR – res cl | 66 | 69 | 77 |
| POR "Si fa" – caus | 83 | 87 | 95 |
| POR – copular | 76 | 85 | 92 |
| POR – reduced | 77 | 85 | 94 |

### 5.3.1 Intervention and feature mismatch in the comprehension of object relatives

The results from comprehension described in the preceding section, much as those from production described in Section 2, have clearly indicated that young (3–4 years) and also older (5–7 years) children acquiring Italian experience the same difficulty with the processing of ORs that has been described in the rich literature on the acquisition of relative clauses cross-linguistically (see references in the introductory section; with subtle differences sometimes related in part to the design utilized). SRs are well processed by typically developing children from the youngest age (3 to 4 years). The significant difference between the good mastery of SRs vs the poor mastery of ORs is a cross-linguistic robust finding to which developing children acquiring Italian conform.[20] In Section 4, the grammatical interpretation proposed for this asymmetry in terms of intervention as hinted at in the introduction will be illustrated in detail through the system proposed in Friedmann, Belletti and Rizzi (2009), in terms of the syntactic principle of Relativized Minimality (Rizzi 1990, 2004a).

The following two sections now review some relevant experimental results obtained through the manipulation of morphosyntactic features of the relative head and of the intervening subject in ORs. The rationale behind this manipulation is the following and is twofold: i. changing some feature(s) of the relative head and the intervening subject, thus creating a feature mismatch situation between the two, may make these two noun phrases different in a way that may render the intervention effect milder; ii. it seems reasonable to check the possible effect of dissimilarity starting from morphosyntactic features such as gender and number,[21] as these are features which minimally distinguish noun phrases in languages which overtly express them in their morphology, as is the case in Italian, e.g. bambin**o** vs bambin**a**//bambin**o** vs bambin**i**. This rationale is directly inspired by the grammatical approach in terms of intervention presented in Friedmann, Belletti and Rizzi (2009) to account for development referred to above and illustrated in further detail in Section 4.[22]

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**20.** A residue of the harder status ORs compared to SRs is also found in well established results from the literature on the adult parsing of these and other related structures involving A' dependencies such as clefts and wh-interrogatives. For a recent discussion, Belletti & Rizzi (2013).

**21.** Case is another possible natural candidate, not for Italian, but in other languages where it is morphologically present; the point has been addressed in Arosio, Yatsushiro, Forgiarini and Guasti (2012) for German, and Guasti, Stravakaki and Arosio (2012) for Greek.

**22.** In a similar vein, a closely related approach is proposed in Grillo (2008) to interpret classical data from the literature on acquired aphasia.

### 5.3.1.1 *The comprehension of object relative and number mismatch*

Adani et al. (2010) investigated three groups of Italian-speaking children aged 5–7–9, tested with a four-picture selection task on their comprehension of ORs. The authors compared the comprehension of ORs under the number match and number mismatch condition in sentences of the type in (22):

(22) a. Il leone che il gatto sta toccando è seduto per terra  M
the lion-SG that the cat-SG is touching is sitting SG

b. Il leone che i coccodrilli stanno toccando è seduto per terra  MM
the lion-SG that the crocs-PL are touching is sitting SG

c. I coccodrilli che i leoni stanno toccando sono seduti per terra  M
the crocs-PL that the lions-PL are touching are sitting PL

d. I coccodrilli che il leone sta toccando sono seduti per terra  MM
the crocs-PL that the lion-SG is touching are sitting PL

The authors also tested the match and mismatch condition for the gender feature. The test sentences and results on the gender condition are presented and discussed in the next sub-section specifically dedicated to the gender feature.

Each picture contained four possible options as in the sample below. Children had to choose the picture matching the sentence presented to them in one of the conditions in (22):[23]



**Figure 1.** A sample of experimental pictures

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**23.** Pictures used for the test sentences to be presented in (25) below.

The results have clearly shown that:

– 5 year olds are significantly less accurate than both 7 and 9 year olds
– the Number Mismatch condition is significantly more accurate than the Match condition in all groups

As for the comparison between the number feature and the gender feature also discussed in the experiment, the overall result is that the number conditions were significantly more accurate than the gender conditions. See Section 3.1.2 for additional discussion on gender. Relevant results are summarized in the following Table 5.5:

**Table 5.5.** Percentages of correct comprehension in each group for the match (M) and mismatch (MM) condition (adapted from Adani et al. 2010)

| Feature | Match | G5yo | G7yo | G9yo |
|---|---|---|---|---|
| **Number** | M | 41 | 79 | 85 |
| | MM | 64 | 88 | 95 |

As can be seen in (22) the test sentences were all center-embedded Object relatives, which are known from classical psycholinguistic literature (Chomsky & Miller 1963) to be generally harder to parse than right branching Object relatives, which have characteristically been tested in works on development. The authors explicitly justify this experimental choice with the idea that use of the harder structure could amplify the potential effect of the morphosyntactic feature manipulation.[24]

Adani et al. (2010) have shown that number matters. This connects to the results from Arosio et al. (2009) presented in Section 3, Examples (18) in which the comprehension of right branching relatives was investigated with a pair choice picture task, which had indicated that Object relatives disambiguated by the preverbal position of the subject were the best understood by children. Recall that the test sentences compared disambiguation through the position of the subject with disambiguation through verbal agreement. In the latter case the subject was postverbal in the sentences tested. In Arosio et al. (2009) there were no test sentences like (23) below in which the subject of the relative clause was both preverbal and plural, triggering verbal agreement in a mismatch situation with the singular relative head.

(23)    Fammi vedere il cane che i cavalli inseguono
        show me the dog that the horses are chasing

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24.    The effect could have otherwise remained obscured in children who were not particularly young and already had a rather good comprehension.

This was done in order to avoid a possible confound as two possibly relevant conditions are combined in (23): position of the subject and number mismatch between the subject and the relative head. Given the results from the number experiment presented in this section from Adani et al. (2010), and the results from Arosio et al. (2009) discussed in Section 3, it is expected that sentences like (23) in which both the position of the subject and the number condition are combined should be best comprehended by children. Although the experimental material utilized was different from the one utilized by Arosio et al. (2009), the results from Adani (2011) presented in 3, seem to go in this direction as sentences like (16)c, repeated in (24) below for convenience, were indeed the best understood ORs by the (older, 7,9) children tested:

(24)    Indica il cavallo [che i leoni stanno inseguendo]. (OO)
        'Point to the horse that the lions are chasing'

### 5.3.1.2    *The comprehension of object relatives and gender mismatch*
As mentioned in the preceding sub-section, Adani et al. (2010) also tested, with exactly the same methodology, the comprehension of (center-embedded) Object relatives in which the relevant feature manipulated in the match and mismatch condition is the gender feature. The type of sentences tested in these conditions are illustrated in (25):

(25)  a.  Il gatto che il topo sta lavando è salito sullo sgabello                 M
          the cat-M that the mouse-M is washing has climbed on the stool

      b.  Il gatto che la capra sta lavando è salito sullo sgabello                 MM
          the cat-M that the goat-F is washing has climbed on the stool

      c.  La capra che la mucca sta lavando è salita sullo sgabello                 M
          the goat-F that the cow-F is washing has climbed on the stool

      d.  La capra che il gatto sta lavando è salita sullo sgabello                 MM
          the goat-F that the cat-M F is washing has climbed on the stool

The main results are summarized in Table 5.6.

**Table 5.6.**  Percentages of correct comprehension in each group for the match (M) and mismatch (MM) conditions (adapted from Adani et al. 2010)

| Feature | Match | G5yo | G7yo | G9yo |
| --- | --- | --- | --- | --- |
| **Gender** | M | 36 | 74 | 85 |
|  | MM | 38 | 81 | 90 |

As in the former case with the number feature, the most interesting age is the youngest one, i.e. the group of 5 y.o. whose comprehension is still rather poor. A comparison with Table 5.5 indicates that the Number condition is more accurate than the Gender condition and that, overall, the mismatch condition is more accurate than the match

condition. The comparison between the amelioration induced by the gender mismatch condition is, however, milder than the one induced by the number mismatch condition.

This shape of these results, and the details emerging from the statistical analysis, led the authors to propose that the different role played by the two morphosyntactic features may be due to their different prominence within the functional structure of the noun phrase, hence, essentially, to a different status of the two features. This issue will be taken up in Section 4.1 again and discussed also in the light of further results on the role of gender mismatch in modulating intervention, to which we now turn from Belletti, Friedmann, Brunato, Rizzi (2012).

The authors investigated the role of gender features in a cross-linguistic perspective. In this work a comparison is made between the possible role of gender mismatch in facilitating the comprehension of Object relatives in two languages, Hebrew and Italian, which both have a rich overt manifestation of the gender feature in their morphology. Children (31) of the same (young) age (3;9–5;3/5; M4;7 in both languages) have been tested in their comprehension of Object relatives in the gender match and mismatch conditions illustrated in (26) with the Italian material:

(26)   **SR same gender**

Mostrami la bambina che disegna la donna
Show-to-me the girl (fem) that draws the woman (fem)
"Show me the girl that draws the woman."

**SR different gender:**

Mostrami la bambina che disegna il dottore
Show-to-me the girl (fem) that draws the doctor (masc)
"Show me the girl that draws the doctor."

**OR same gender:**

Mostrami la bambina che la donna disegna
Show-to-me the girl (fem) that the woman (fem) draws
"Show me the girl that the woman draws."

**OR different gender:**

Mostrami il dottore che la bambina disegna
Show-to-me the doctor (masc) that the girl (fem) draws
"Show me the (male) doctor that the girl draws."

Comprehension was tested using a sentence-picture matching task (adapted to Italian from the Hebrew version in Friedmann and Novogrodsky 2004). Children heard a sentence, and were presented with two pictures. One of the pictures matched the sentence, and in the other the role of the characters in the picture was reversed, as in the similar test described in Section 3, Example (20). A sample of the pictures used in the gender match and mismatch condition is given in (27) and (28) for the same gender and the different gender condition respectively:

(27)



(28)
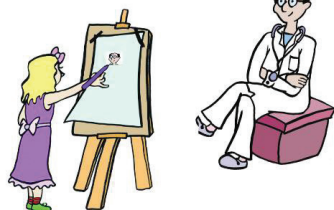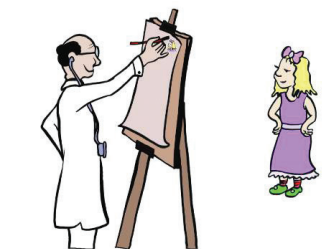


Results showed a very different effect of gender mismatch in the two languages in the comprehension of Object relatives, as illustrated by the following Table 5.7:

**Table 5.7.** Percentage of correct responses by Italian-speaking and Hebrew-speaking children (3;9–5;3/5; M4;7 in both languages) (adapted from Belletti, Friedmann, Brunato, Rizzi 2012)

| | Subject relative same gender | Subject relative different gender | Object relative same gender | Object relative different gender |
|---|---|---|---|---|
| Italian | 82% | 86% | 52% | 57% |
| Hebrew | 85% | 89% | 67% | **81%** |

Whereas Subject relatives were very well understood by all of the children, Object relatives were poorly understood in both languages in the same gender condition. The effect of gender mismatch is significantly strong in Hebrew, and it sharply ameliorates children's performance; it is virtually absent in Italian. The statistical analysis confirms the sharp distinction between the two languages.

Given the controlled comparison described, in which exactly the same material and method has been used in the two languages investigated with children of exactly the same age, these results indicate neatly that the role of the same morphosyntactic feature may vary from one language to the other, independently of its richness and possibly widespread presence in a given language, as is the case for both Italian and Hebrew. The question then becomes why it should be so. The authors have proposed to express this difference in terms of the different formal status of the same gender features in the two languages with respect to the locality principle of Relativized Minimality that constrains syntactic computations. The following Section 4 outlines in more details the approach developed in Friedmann, Belletti, Rizzi (2009), on which this proposal in Belletti, Friedmann, Brunato, Rizzi (2012) as well as the closely related proposal in Adani et al. (2010) presented in 3.1.1, and Adani 2010 discussed in 3, are all grounded.

## 5.4   Toward interpreting children's development: Intervention and the locality of syntactic dependencies

In Friedmann, Belletti, Rizzi (2009) a featural approach to the syntactic principle Relativized Minimality (RM, Starke 2001; Rizzi 1990, 2004a; and, along similar lines, Grillo 2008, for aphasia) was assumed to interpret the difficulty that children experience cross-linguistically in their development of an adequate mastery of ORs, which is also residually manifested in the slower parsing of the same structure by adults (Belletti & Rizzi 2013 for recent discussion, and the references cited therein). Belletti (2012, 2014) assumed the same approach to account for the ample use of PORs/Passive Object Relatives, i.e. Subject relatives in the passive produced when an Object relative is elicited, which is resorted to widely by adults in Italian and which Italian-speaking children also tend to use as they grow older and master the passive computation better. As presented in Section 3, Example (19) the privileged status of (different types of) PORs as opposed to active Object relatives (either with gap or with resumptive clitic pronoun) is also found in the comprehension results.

Based on results from (mainly) comprehension experiments in Hebrew speaking children (age range: 3;7–5), Friedmann, Belletti, Rizzi (2009) proposed that the difficulty in the processing of ORs that children showed in that language, and which contrasts with their good mastery of SRs from the youngest age tested, can be attributed

to the operation of the same syntactic locality principle interpreted in featural terms, featural-RM, which is known from theoretical work in syntax to constrain syntactic computations in general (similarly to principles of Minimal search as in Chomsky 2000, 2001). Consider the classical schema of the RM principle in (29):

(29)    In a configuration:

$$X \ldots\ldots Z \ldots\ldots Y$$
$$\text{target} \quad \text{intervener} \quad \text{origin}$$

a local relation between X and Y cannot be established if Z intervenes, and Z is a position of the same type as X.

> Same type = sharing relevant features

<div align="right">(Rizzi 1990, 2004a)</div>

Following Rizzi's approach, Friedmann, Belletti, Rizzi (2009) proposed that a feature that they label +NP is among the attracting features of the relative head in the CP space of relative clauses, as it appears to be in other A′-dependencies such as wh questions of the type in (30)a.[25] Adopting Starke's featural implementation of the RM principle, if the feature composition of the target position of syntactic movement is enriched of some feature to which the principle is sensitive, so that it becomes dissimilar enough from the intervener, the resulting structure is better processed in the adult grammatical system. This accounts for the better status of cases of extraction from a wh-island as (30)a, in which the wh-phrase *which problem* is extracted from the indirect wh-question introduced by *how* (the wh-island) and moved into the target position in the main clause CP. The wh-phrase *how* is then the intervener with respect to the moved wh-phrase *which problem*. (30)a contrasts with the ungrammatical (30)b, a classical RM violation in which the target and the intervener are identical in the feature composition relevant for the principle. As the ungrammaticality of (30)c shows, it is not sufficient to manipulate either the target or the intervener in order to make them dissimilar in feature composition for the structure to become better processed: the crucial role is played by the feature composition of the target position of movement, as enriching the feature composition of the intervener with exactly the same NP feature does not yield any amelioration in (30)c.

(30)    a.    ? Which problem do you wonder how to solve ⟨which problem⟩?
        b.    *How do you wonder who behaved ⟨how⟩
        c.    *How do you wonder which problem to solve ⟨how⟩?

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**25.**   In the relevant cases discussed the feature is realized in full lexical noun phrases, e.g. lexical head of the relative clause/lexical subject in the relative; lexical noun phrase in which-questions of the type in (30)a.

Thus, the featural approach to RM, phrased in Starke's terms, can be summarized as in (31) from Friedmann, Belletti, Rizzi (2009), where A and B are an abbreviation for any feature, relevant for the principle:

(31)

|  | X | Z | Y |  |  |
|---|---|---|---|---|---|
| (I) | +A | … +A | … ⟨+A⟩ | * | (identity) |
| (II) | +A,+B | … +A | … ⟨+A,+B⟩ | OK | (inclusion) |
| (III) | +A | … +B | … ⟨+A⟩ | OK | (disjunction) |

According to (31), identity of features between target and intervener yields ungrammaticality, whereas disjunction yields full grammaticality. Also the situation of proper inclusion of the feature(s) of the intervener within the target yields an amelioration up to acceptance; examples like (30)a are one representative case, as (32) schematically illustrates:

(32)    Which problem do you wonder how to solve ⟨which problem⟩?
          Q NP                              Q            Q    NP
       Q = the interrogative attracting feature

The schema in (31) describes adults' grammars and it underscores one crucial aspect of the functioning of the locality principle: the crucial role is played by the feature composition of the target; if it is enriched of feature(s) to which the principle is sensitive, so that the feature composition of the intervener becomes properly included within the feature composition of the target, the structure is properly processed by the adult system. As the target is the head attracting movement into the CP space in the derivation of A' dependencies – e.g. relatives, and wh-questions as in (30)a – according to (31), the statement in (33) can be made:

(33)    The crucial role is played by morphosyntactic attracting feature(s) triggering syntactic movement

Thus, not only the relevant features considered for the computation of dissimilarity between the target and the intervener are morphosyntactic features given the very nature of the formal grammatical principle; it is also the case that the only morphosyntactic features to which the syntactic principle is sensitive are attracting features, those features which trigger syntactic movement.[26]

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**26.**    This account is very much in the spirit of memory-based parsing accounts formulated in the psycholinguistic literature, e.g. Gordon et al. (2004). According to Gordon et al. much as in the account presented in the text, it is not just any dissimilarity between target and intervener, e.g. the relative head and the intervening subject (see discussion below) which makes the Object relative structure better parsed by adults, but the only relevant dissimilarity, which counts is the

On the basis of these background considerations, Friedmann, Belletti, Rizzi (2009) have proposed that:

i.   a nominal feature labeled +NP is among the attracting features in (restrictive) headed relative clauses much as it appears to be in wh-questions as (30)a;
ii.  the proper computation of the feature inclusion relation described in (31)II is subject to development

Recall that the feature inclusion relation described in (30)a is the relation that yields a properly processed rather acceptable structure in the adult grammar (e.g. (30)a/ (31)II). The hypothesis put forth by Friedmann, Belletti, Rizzi (2009) is that this takes some time to develop: children have difficulty in processing the featural inclusion relation. Hence, intuitively put, in the child grammar a situation of identity and a situation of inclusion are equally problematic. This interpretive hypothesis of development is schematized in (34).

(34)

|  | X | Z | Y | Children | Adults |
|---|---|---|---|---|---|
| identity: | +A … | +A … | ⟨+A⟩ | * | * |
| inclusion: | +A,+B … | +B …. | ⟨+A,+B⟩ | * | ok |
| disjunction: | +A … | +B … | ⟨+A⟩ | ok | ok |

Identity between X (target) and Z (intervener) is excluded by both children and adults, whereas disjunction is properly computed by both; there is development in the proper computation of the intermediate inclusion relation.[27]

This hypothesis accounts for why children have difficulty with the proper processing of headed Object relatives with an intervening lexical subject within the relative clause. As is illustrated in (35), the (hard for children) inclusion relation inevitably

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one expressed by morphosyntactic features. However, as is discussed in some detail in Belletti and Rizzi (2013), the formal syntactic interpretation described in the text goes one step further: it is not the case that any morphosyntactic feature plays a crucial role, but only features attracting syntactic movement do, which are expressed in the target.

**27.** To some extent the inclusion relation is computationally harder/more complex also for adults as witnessed by the non perfect status of sentences like (30)a, in which the wh-island violation is ameliorated but not totally eliminated. Hence, it is no surprise that the computation of the inclusion relation is harder, or even impossible for the (young) children's immature computational system. The view endorsed in the text and in the quoted references is that grammar and processing are related systems; grammatical principles drive processing in both production and comprehension, but some computational steps may be harder and then take some time to be fully mastered. Belletti & Rizzi (2013) for further discussion.

obtains in headed Object relatives with an intervening lexical subject within the relative clause (+R stands for the feature attracting the noun phrase head of the relative clause into the dedicated position within the CP (see (2) and Footnote (1):

(35)  (Show me) **the elephant** that **the lion** is wetting ⟨**the elephant**⟩
         +R, +NP           +NP                    +R, +NP
            X                  Z                        Y

The described approach put on the research agenda the natural question of which features are those to which featural RM is sensitive. This is precisely the research question addressed in the experiments described in 3.1.1 and 3.1.2, from which a different status of the number and the gender features has emerged in Italian. The following section takes up the issue in further detail.

### 5.4.1   Feature mismatch and the grammatical status of morphosyntactic features

Adani et al. (2010) proposed that the facilitating effect that the number mismatch condition appears to have in children's comprehension of Object relatives in Italian presented in 3.1.1 can be interpreted in terms of the featural approach to RM discussed in the preceding section by assuming a hierarchical representation of different morphosyntactic features inside the DP structure. According to the authors' proposal, the number feature corresponds to a prominent head in the functional structure of the noun phrase. Such prominence may be exploited by the computational system in calculating the dissimilarity relevant for the locality principle, which helps in modulating intervention making it milder in the mismatch situation, for the (older) children tested in their experiment. Given the results from the comparison with the gender feature in the equivalent mismatch condition emerged from their experiment, the authors concluded that the gender feature should be considered a less prominent feature within the DP functional structure of the noun phrase, which should thus not be accessible for the computation of the dissimilarity relevant for featural RM.

   The comparative results between Hebrew and Italian described in 3.1.2, have clearly indicated that the role of the morphosyntactic gender feature is not the same in the two languages: gender mismatch modulates intervention thus enhancing the comprehension of Object relatives only in Hebrew, but not in Italian, despite the fact that gender is a morphosyntactic feature widely represented in Italian as well as in Hebrew. The conclusion that can be drawn from these comparative results is that the status of a morphosyntactic feature is not uniform across languages, but it crucially depends on properties of the grammatical system of each language. Following the system in Friedmann, Belletti, Rizzi (2009), Belletti, Friedmann, Brunato, Rizzi (2012) proposed that the crucial property determining the status of a given morphosyntactic feature is whether the feature is among those triggering syntactic movement. These

are the features to which the locality principle is known to be sensitive from solid and long lasting results in formal syntactic research, briefly presented in the preceding section. Thus, the very same feature may be syntactically active for the principle in some languages but not in others. This could be precisely the case of the gender feature in Hebrew vs Italian. One important difference between the two languages is that only in the former is gender represented in the verbal agreement morphology with the subject (36a vs b). Hence, gender appears to be among the morphosyntactic features attracting the subject into the subject position of the clause from the vP-internal position where it is merged as a member of the argument structure of the verb phrase (Koopman & Sportiche 1991 for the original so called VP-internal subject hypothesis). No gender feature is expressed in the subject-agreement verbal morphology of finite verbs in Italian (36c, d):

(36)   a.   Yoni shar
            Yoni sings-singular-masculine

       b.   Miri shara
            Miri sings-singular-feminine

       c.   Gianni canta
            Gianni sings-singular

       d.   Maria canta
            Maria sings-singular

We note in conclusion that the different status of gender in the two languages may or may not be related to its hierarchical position within the noun phrase functional structure. If it does, this would imply that the position it fills in the functional structure of the noun phrase be different in the two languages. Should this be the case, one should then expect to find other differences in the internal and external syntax of the noun phrase in Italian and Hebrew involving the gender feature. This question remains open given the available evidence so far. In the lack of the required evidence, the null hypothesis is to assume that the gender feature be located in the same position within the map of the functional structure of the noun phrase of the two languages and that the difference concerns its status as an attracting feature triggering syntactic movement in Hebrew but not in Italian. Hence, only in Hebrew, but not in Italian, is gender relevant to modulate the locality of the long distance dependency of Object relatives constrained by featural RM.[28]

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**28.**   Belletti, Friedmann, Brunato, Rizzi (2012) propose that gender mismatch gives rise to a set theoretic feature intersection relation in Hebrew. Thus, the intersection relation appears to be well mastered by children in the relevant age. This suggests that the hard relation for children to compute and which is subject to development is just the feature inclusion relation, as discussed. This is a topic of current investigation.

By the same rationale of the described account, one should also expect that number mismatch should have an effect in accommodating the locality of the long distance dependency of Object relatives in Italian. As indicated by the existence of verbal subject agreement in Italian illustrated in (37), number should be attributed the status of an attracting feature in the same terms as gender in Hebrew; thus number is a feature to which the RM principle is sensitive.

(37)  a.  La ragazza disegna
          the girlSG paintsSG

      b.  Le ragazze disegnano
          the girlsPL paintPL

The results presented in 3.1.1 obtained by Adani et al. (2010) confirm the correctness of this expectation.[29] The described approach in terms of featural RM is thus predictive of the developmental path and provides a first explanation for it.

### 5.4.2  Number feature and pronouns as relative heads or subjects: Comprehension and production

Number mismatch does not seem to help children's production of ORs in contrast with the results from comprehension just reviewed. The results presented from elicited production in Sections 2.1, 2.2 (Belletti & Contemori 2010; Contemori & Belletti 2013; Guasti et al. 2012a) have indicated that, irrespective of the number match or mismatch between the relative head and the subject of the relative clause, children resort to different types of productions, with no difference based on the number feature. This could suggest that in production, at least under the experimental conditions tested, the tendency is to go for the optimal derivation/computation. As the results from Contemori and Belletti (2013) and related work show, this appears to be passive in Italian, as also shown by adults' results and by the developmental path (see

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Gender agreement on the past participle under object cliticization in Italian (e.g. L'ho vista/ (I) have her$_{fem, sing}$ seen$_{fem, sing}$; see Chapter (3) may indicate that gender is active in triggering this syntactic movement, i.e. cliticization, in Italian. However, gender never has this status in the higher part of the clause relevant for subject agreement in Italian. The intervention issue discussed in this chapter is concerned with subject intervention, hence with the high part of the clause.

**29.**  The idea that overtness of number agreement in Italian may play a role in facilitating the comprehension of Object relatives is also entertained by Adani et al. (2010), with number agreement interpreted as an overt cue which could be exploited by the parser. The proposal in the text, offers a formal characterization of what the status of a morphosyntactic feature should be in order for it to count as a possible cue: overtness does not suffice, the feature must be among those attracting syntactic movement, as discussed. Belletti, Friedmann, Brunato, Rizzi (2012) for further discussion.

Belletti 2012 for the proposal of this approach). A closer discussion phrased in terms of the locality approach presented in Section 4.1. as to why resort to passive could somehow qualify as optimal is presented in the following Section 4.3.

Guasti et al. (2012a) reached similar conclusions. First, they also noted that manipulation of the number feature was not exploited by children in the production of the elicited headed Object relatives.[30] Then, they interestingly noted that their youngest group (5 y.o), that is not yet able to resort to passive in a productive way (in contrast with their older group, 9 y.o.), had rather a preference for the production of Object relatives with a pronominal instead of lexical head (Reduced head response in their coding), with a lexical subject in the relative clause, as illustrated by productions like (38, repeating (14) above):

(38)    Quello che i gatti lavano
        The one that the cats wash

As the authors note, Reduced head responses are also found when a SR is elicited; given that the experimental conditions typically require the choice between two alternatives, a pronominal head like the demonstrative in (38) is pragmatically appropriate in both subject and object relatives. However, as the authors also note, pronominally headed relatives are found much more widely when an OR is elicited.

Clearly, this consideration is extremely relevant for the interpretation appealing to featural RM to account for development in terms of the system in Friedmann, Belletti, Rizzi (2009) presented in 4. It combines with the complementary consideration that can be made, based on the production results presented in 2 from Belletti and Contemori (2012) according to which (even young) children do not experience difficulty in the production of Object relatives when also the subject of the relative clause is pronominal (be it overt or null, see the presentation in 2.4).[31] Under the natural assumption that there is no +NP feature in the feature composition of pronouns, as the feature expresses the lexical nature of the nominal element carrying it, in both cases like (38) above and cases like (39) below (from Belletti & Contemori 2012 samples of children's productions) no inclusion of the NP feature is ever created between the target relative head and the intervening subject of the relative clause in these conditions.

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**30.**    In contrast with animacy by younger children only, see Section 2.3 above.

**31.**    This is a result in line with the results from Hebrew presented in Friedmann, Belletti, Rizzi (2009), in which Object relatives with a (null) pronominal subject were well understood by children in contrast with Object relatives with a lexical subject in the relative clause. Together with the good comprehension of Free Object relatives in Hebrew, this was one of the two strongest pieces of support for the account in terms of inclusion of the +NP feature presented in 4. See Friedmann, Belletti, Rizzi (2009) for detailed discussion.

(39)   quello che ha fatto (lui)
        the one that pro has done (he)

Note that if in the case in (38) the lexical subject of the relative clause is endowed of the +NP feature since it is a lexical noun phrase, in the case of (39) neither the relative head nor the intervening subject is endowed with this feature as they are both pronominal. The fact that (39) is easily processed by (even very young) children clearly indicates that the formal locality principle is not disturbed by similarity of the feature composition of the target relative head and of the subject of the relative clause when they are both pronominal. This interestingly supports the idea that it is not a pre-theoretical notion of similarity that seems to play the crucial role, but rather the formal notion relevant for featural RM ultimately solely concerning features attracting syntactic movement.[32]

As reminded above and reviewed in Section 3, Arosio et al. (2009) have established that in the comprehension of Object relatives disambiguation through position of the lexical subject is more effective than disambiguation through verbal agreement. Arosio et al. interpreted the less effective disambiguation through agreement as due to the fact that morphosyntactic checking of agreement takes place once thematic roles have already been assigned, hence it requires a longer and more complex reanalysis, the idea being that the SR interpretation is always entertained first and then abandoned at the position of the complementizer. Although this interpretation might very well be on the right track, further factors should also be taken into account that presumably play a role given the shape of the data tested by the authors. Since in the test sentences the plural lexical subject was always post-verbal under the number mismatch condition (see paradigm (18)) the possible often discussed intrinsic complexity of the computation of post-verbal subjects (De Vincenzi 1991) and of the computation of agreement with the subject in the post-verbal position may also play a role in accounting for the milder effect of agreement vs position. As proposed in Adani (2011) in connection with her results on paradigm (16), assuming Guasti and Rizzi's (2002) approach to agreement checking, verbal agreement with a post-verbal subject is solely checked through the AGREE relation whereas verbal agreement with a preverbal subject is also checked in a Spec-Head configuration. This makes the first type

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**32.**   The reader is referred to Belletti and Rizzi (2013) for relevant discussion in relation to the critical assessment of Warren and Gibson's objections to Gordon et al.'s similarity approach in adult parsing.

Belletti and Contemori (2012) note the also possible (marginal) role played by animacy mismatch in the good performance by the young children in the sentences tested in their experiment, suggesting however that the crucial role should be attributed to the mismatch in the [NP] feature. In Italian animacy does not generally lead to the strong amelioration found in the productions of this experiment, as pointed out in Section 2.3. For a first discussion on the possible role of animacy see Arosio, Guasti, Stucchi (2011).

of verbal agreement somewhat weaker as discussed in Guasti and Rizzi also through crosslinguistic evidence. Adani attributes the difficulty revealed by her results with the OOp Object relatives to the weakness of agreement obtained through AGREE in the terms of Guasti and Rizzi's system. It is not inconceivable that this factor be also involved in the weaker role of verbal agreement in comparison with position of the subject in disambiguation, ultimately in enhancing the correct interpretation. Alternatively, it is also possible that the agreement process with a post-verbal subject obtained through AGREE may be made harder by the intervening copy of the object moved into the relative head position; this copy may give rise to an intervention effect, as discussed in Chapter 6 Section 7 in connection to related structures in wh-questions (Guasti, Branchini, Arosio 2012, and relevant references cited in Chapter 6). All these considerations are the topic of current investigation and are open to further research.

### 5.4.3 Passive and intervention: PORs in elicited production

As was presented in 2.2 PORs are the preferred answer to the various tests eliciting the production of Object relatives, overwhelmingly for adults, developmentally for children. The question then arises as to why it is so. In particular, does the intervention account proposed have anything to say on this? As proposed in a number of the references quoted (e.g. Belletti 2012, 2014; Belletti & Rizzi 2013a; Contemori & Belletti 2013), the answer is positive under the analysis of passive in terms of the operation referred to as smuggling in Collins (2005) and related work. The operation is triggered by part of the passive morphology, illustrated by the preposition *by* in the schematic derivation in (40)a; this component of the passive morphology triggers movement of a chunk of the verb phrase, containing at least the lexical verb and the internal argument, the direct object. The effect of this displacement is that movement of the internal argument into the (EPP) subject position of the clause takes place in a way compatible with the familiar locality constraint/RM on syntactic derivations. The standard derivation of passive sentences traditionally assumed is incompatible with the otherwise general locality principle discussed, as movement of the internal argument would cross over the external argument in the vP internal position, as illustrated in (40)b (see also Chapter 4). Collins' approach provides an interesting suitable alternative. This approach to the passive has generated a research trend, which has demonstrated that smuggling type operations may indeed be quite widespread in grammar, with different triggers of the operation moving verbal chunks of the verb phrase.[33] The *by/da* component of the passive morphology is one such crucial trigger. In (40)c the derivation of a

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[33]. Causatives and passive causative are crucial further cases of derivations implying smuggling. See Chapter 4 for more on this in the context of acquisition of the passive in Italian. Manetti & Belletti (2014).

POR is indicated, with movement of the relative head in the CP dedicated position: as is clear from the schema, there is no intervention of the lexical subject in this derivation, as movement of the internal argument occurs from the smuggled position filled by the moved chunk of the verb phrase:

(40)
Schematic derivation of Passive trough *smuggling*:

a.   [$_{TP}$Il bambino   è   [$_{VP}$ abbracciato ⟨il bambino⟩] *da* [$_{vP}$ la mamma ⟨VP⟩]

Schematic standard derivation of Passive with no *smuggling*; intervention problem:

b.   Il bambino è abbracciato da [vP **la mamma** [$_{VP}$⟨abbracciato⟩ il bambino]][34]

Schematic derivation of a POR:

c.   [$_{CP}$ Il bambino che [$_{TP}$ *pro* è [$_{VP}$ abbracciato ⟨il bambino⟩] da [vP la mamma ⟨VP⟩]]][35]

The reason why passive takes priority in adults and, developmentally in children, over number feature mismatch, a condition tested in some of the material of the production experiments,[36] has been interpreted in the references quoted as again a consequence of locality along the following lines. Clearly the optimal way to satisfy featural RM is the feature disjunction condition of the schemas in (31III) and (34); feature disjunction amounts to lack of intervention altogether. The smuggling operation may be assumed to have a comparable effect as it is a radical operation affecting structural

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**34.**   The past participle is located in its derived position occupying some functional head where this component of the passive morphology is checked. The same operation should also occur in (37)a; it is not indicated to simplify the representation in (37)a.

**35.**   Movement to the CP is assumed to occur directly from the *smuggled* position; a silent (expletive) *pro* sits in the preverbal EPP-subject position. Movement does not occur from the EPP position for principled reasons. See Rizzi & Shlonsky (2007) for detailed discussion. Nothing crucial hinges on this technical detail, which is not directly relevant to the discussion in the text. It should be noted that presence of a (null) pronominal does not create intervention with the relative lexical head anyway, as discussed in the previous Section 4.2.

**36.**   In particular, the productions presented in Contemori and Belletti (2013) are for the largest part obtained in the Preference task under number mismatch between the relative head and the lexical subject of the relative clause.

dependencies: through movement of the relevant portion of the verb phrase intervention is simply eliminated. Thus, a POR can count as an optimal way to satisfy locality. This may be the reason why PORs are overwhelmingly produced by adults and children tend to conform to the adults' behavior as they grow older and passive becomes productively available to their computational system.

As discussed in Section 3 (types of) PORs are also well comprehended by children at the ages in which they master the passive computation.

The grammatical interpretation proposed for the robust results found in both production and comprehension of relative clauses may be challenged under the natural hypothesis that the privileged status of PORs be simply due to a possibly significant occurrence of the structure in the input to which children are exposed. In other words, the privileged status of PORs could just be a frequency effect: children would simply reproduce what they hear in their input. An account along these lines is immediately put into question by the observation discussed here, in particular for production, that children approach the adults' behavior gradually, with more PORs produced as they grow older. Hence, already from this developmental perspective, the frequency account would have to be supplemented by some further hypothesis. On this vein, one could say that the computation(s) involved in passive must mature in some sense, following an assumption often made more or less explicitly in the literature on passive(s) (Borer and Wexler 1987): Once children are ready to form passives, they produce PORs instead of the elicited active Object relatives because PORs are frequent in the input they are exposed to. However, even this somewhat weaker frequency account does not prove to be tenable on an empirical basis. The question whether PORs may be frequent in children's primary data and more generally in standard Italian has been explicitly asked in Belletti & Chesi's (2011) study. The authors have calculated the occurrence of different types of relatives in various corpora of Italian. Results from all the corpora analysed have shown that PORs are an extremely rare type of construction in Italian in general, and in child directed speech in particular. The following Tables from Belletti and Chesi (2011) clearly show that PORs are virtually absent in all the corpora analysed (see the reference quoted for precise description of the corpora considered). In Table 5.8 only full PORs are considered, with an overt complementizer and the full passive verbal structure; in Table 5.9 reduced PORs are added as they were widely attested in adults' productions; also in this latter case passive object relatives are very poorly attested in spontaneous production.

This study then provides a clear answer to the question raised on the basis of the experimental production and comprehension results: PORs are <u>not</u> privileged because they are a frequent structure in the (children's) input data, as PORs are extremely infrequent. The study then opens up the novel questions as to why, (i) despite their infrequency PORs are resorted to so widely by young and adult Italian speakers, and (ii) why the experimental data and the spontaneous production data should diverge

**Table 5.8.** Raw figures and percentages of various types of relatives in different Italian corpora (from Belletti & Chesi 2011)

| Corpus | # of Rs | # SRs (%) | # ORs (%) | # PORs (%) |
|--------|---------|-----------|-----------|------------|
| CIT | 477 | 295 (62%) | 117 (25%) | 19 (4%) |
| CHI A | 677 | 440 (65%) | 228 (34%) | 1 (0.1%) |
| SUT | 174 | 159 (91%) | 12 (7%) | 3 (2%) |
| CHI C | 94 | 83 (88%) | 11 (11%) | – |

CIT: Corpus di Italiano Televisivo (7 TV programs)
CHIA: Adults' productions from the analyzed files in CHILDES
CHIC:Children's productions from the analyzed files in CHILDES
(Same files considered for children and adults: 8 children, 113 files, plus 19 files from 1 child collected and transcribed at CISCL/University of Siena, Matteini 2011)
SUT: Siena University Treebank (29 television news programs, Chesi et al. 2008)

**Table 5.9.** Raw figures and percentages of various types of relatives in different Italian corpora, including reduced relatives (from Belletti & Chesi 2011)

| Corpus | # of Rs | # SRs (%) | # ORs (%) | # PORs (%) |
|--------|---------|-----------|-----------|------------|
| CIT | 477+48 | 295 (56%) | 117 (22%) | 19+48 (10%) |
| CHI A | 677+78 | 440 (58%) | 228 (30%) | 1+78 (10%) |
| SUT | 174+22 | 159 (81%) | 12 (6%) | 3+22 (13%) |
| CHI C | 94 | 83 (88%) | 11 (11%) | 0+15? |

so significantly as to the appearance of PORs. The discussion of this section has provided a formal answer to the first question in terms of elimination of intervention; the second question remains open for the time being and is the topic of current research.

## 5.5   The acquisition of Subject and Object relatives in special circumstances: In children with SLI, with developmental dyslexia, in autistic children, in hearing impaired children, in adult L2 acquisition

The present section reviews some recent results on the acquisition of Subject and Object relatives in Italian in special circumstances.

i.   Children with SLI
We start by considering the investigation conducted by Contemori and Garraffa (2010) who have utilized the same designs and material – Preference task and Picture description task – described in Section 2 to elicit the production of Subject and Object relatives and the picture matching task described in Section 3 to test comprehension.

These authors also tested the ability to repeat the sentences which were the target sentences in the elicitation experiments, i.e. (41)a for Subject relatives and (41)b for Object relatives:

(41)    a.    La bambina che lava la giraffa
              the girl that washes the giraffe

        b.    La bambina che la giraffa lava
              the girl that the giraffe washes

They tested four SLI children whose age range was 4;5–5;9 and compared their performance to that of eight children with typical development (TD), divided in two groups: four TD-I age-match, and four TD-II of a younger age (3;7–3;10). Given the relatively young age of the participants in the SLI group, children's performance was unsurprisingly rather poor overall. However, the authors found the by now familiar subject relatives vs object relatives asymmetry in a rather interesting way.

First of all, the comprehension of Subject relatives was significantly better than the comprehension of Object relatives and SLI children (range 85% to 95%) matched TDI, the older group of control children (range 85%–100%). Their comprehension of Object relatives instead (range 30%–60%) rather matched the also poor comprehension of TDII, the younger group of control children (40%–75%).

The production results were remarkably poorer in the SLI group compared to both groups of control, for both Subject relatives and Object relatives. As is known from previous sections, the production of Object relatives is anyway relatively poor in the age range tested also in typical development. Children produce a variety of non-target productions, such as changing the verb of the sentence to keep the relevant meaning (42a), changing the character they identify themselves with (42b), use of declarative instead of an object relative (42c); sometimes, typically developing children, especially in the younger ages, may answer with a simple noun phrase (42d): (see also Contemori & Belletti 2013 and Contemori & Garraffa 2010 for further detailed illustration); sometimes children also produce object relatives with the (clitic) resumption strategy (42e):

(42)    Target:   la bambina che la mamma accarezza ____
                  the girl that the mother hugs ____

        a.    la bambina che riceve una carezza dalla mamma
              the girl that gets a hug from the mother

        b.    la mamma che accarezza la bambina
              the mother that hugs the girl

        c.    la mamma accarezza la bambina
              the mother hugs the girl

        d.    la bambina
              the girl

  e.   la bambina che la mamma la accarezza
       the girl that the mother her-CL hugs

As they grow older, TD children start producing PORs, as illustrated in Section 2. This happens at around age 5 or later, which is the age of the older TDI group and the age range of the SLI group in Contemori & Garraffa's experiments. Hence, not surprisingly, PORs are absent in both TDI and in the SLI group in their results. The most widely adopted reaction by SLI children was however different from that of TDI and TDII: in half of the cases SLI children simply provided no response (52.5% for both Subject and Object relatives); another significant reaction was the production of a declarative sentence instead of the elicited relative clause (25.8% and 27.5% for Subject and Object relatives respectively).

The results from the repetition task also showed a very poor performance of the SLI group in the repetition of both Subject and Object relatives: in this case the widely produced structures were simple declaratives instead of relative clauses of either type. Interestingly, repetition was at ceiling (ranging from 92.5% to 80%) for both types of relative clauses in both groups of typically developing controls.

Thus, overall, these results indicate that the familiar Subject relative vs Object relative asymmetry is also found in SLI children. The comprehension results show this clearly. The partly different shape of the production results, both in elicited production and in repetition, indicates a particular difficulty for the weak computational system of the (relatively young) SLI group in processing the complex dependency of relative clauses. Contemori and Garraffa (2010) speculate that the difference between comprehension and production that emerges in their results with subject relatives in the SLI group could reflect the fact that good comprehension of Subject relatives may be only apparent in the comprehension results, as the SLI children could in fact interpret Subject relative clauses as simple declaratives, disregarding the presence of the complementizer. This interpretation would be made plausible by the fact that in subject relatives the order of arguments without the complementizer is the canonical order of declarative sentences: *Il bambino* (*che*) *accarezza la mamma*//The child (that) hugs the mother. Hence, the difficulty of the SLI group would concern all types of relative clauses in both production and comprehension. More data and results are necessary to draw any firm conclusion on this point. The issue is left open to further research, which should also consider SLI children of older ages, hence more likely to have developed in their linguistic abilities.

ii.   Children with developmental dyslexia-DD
Guasti, Branchini, Vernice, Barbieri and Arosio (in press) have tested the oral language of children with DD in their ability to produce relative clauses, both subject and object relatives, through an adaptation to Italian of the original Hamburger and Crain (1982) design (already mentioned in 2.1 and 2.4). By the elicitation technique,

children were led to choose a character in a video they had been presented with, by identifying it through the production of a relative clause (e.g. "Touch the man that the dancers greet", for an object relative). A group of 24 Italian-speaking children with DD aged 7;8–12;2, mean age 9;3, were tested and their productions were compared to those of a control group of typically developing children matching in chronological age (CA) with the same mean age of 9;3. No child of the DD group had been previously diagnosed as having SLI. The results have indicated that children with DD overall produced fewer correct relative clauses than the CA control children. Similarly to their CA matched controls they were better with subject relatives than with object relatives. More specifically, however, only half of the DD group, i.e. 12 children, scored below the means of the CA group in the production of object relatives. The hardest object relative clauses were thus harder for a subgroup of the DD children. This result is remarkably similar to those from studies on children with SLI. As the authors discuss at length, this suggests that this group of DD children were likely to be in fact undiagnosed SLI speakers. The comorbidity of SLI and DD is a central issue that studies of this type, which carefully look at the oral language of children with DD, address and contribute to clarify, also in the perspective of promoting early general screening for SLI.

iii.   Hearing-impaired children

By using the same comprehension design from Adani (2011) described in Section 3 based on Adani (2008), Volpato and Adani (2009) have tested the comprehension of subject and object relatives in a group of 8 hearing-impaired children (HI, age range 6;10–9;3) with cochlear implant (implanted before age between age 2;1 and 4;4). Their results reproduced those found in Adani (2011) with typically developing hearing children in the youngest ages (cf. Section 3, (16)), with Subject relatives comprehended well (89%) and Object relatives poorly understood (55%), and particularly so in the OOp condition (22%), i.e. an object relative with a post-verbal subject. Overall, however, the HI comprehension results have indicated a less accurate comprehension than that of Adani's (2011) original experimental group with typically developing children (Section 3 (16)), and of the (three) control groups (matching for morphosyntactic abilities, vocabulary and age) of their own study. Volpato and Adani also report the data on the number of HI children who performed above chance: whereas for Subject relative (OS) 8 out of 8 children performed above chance (same value as for all TD control children), in Object relatives in the OO condition only 3 out of 8 children did (against 6/8/7 out of 8 TD children of the three control groups) and in the OOp condition only 1 out of 8 was above chance (against 4/3/4 out of 8 TD children of the three control groups). This clearly indicates that in the HI group the complexity of the hardest Object relative structures is amplified.

A related result is discussed in Volpato (2012), in which 13 HI children (age range 7;9.10;8) with cochlear implant have been tested manipulating the number

feature of the head of the object relative clause and the subject of the relative clause. In contrast with the results from Adani et al. (2010) with typically developing children presented in Section 3 and from the control group(s) in this study, HI children showed no amelioration in their comprehension of Object relatives under the relevant number mismatch condition. This suggests that their impairment limits resort to morphosyntactic cues.

The ability to produce Subject and Object relatives by HI children with cochlear implant has been tested by Volpato and Vernice (2014). 13 HI children (age range 7;9.10;8) with cochlear implant were tested through an adaptation of the Preference task described in Section 2.1 also using pictures. HI children were tested orally; they had to produce Subject and Object relatives corresponding to their preferred choice, e.g. SR: *Mi piacciono i bambini che accarezzano/colpiscono il gatto*//I like the children that are hugging/hitting the cat; OR: *Mi piacciono i bambini che la maestra premia/sgrida*// I like the children that the teacher is praising/punishing. The productions of the CI children have been compared with those of normally hearing (NH) children matching in chronological age (CA), in language age (LA) (5;0–7;9) determined through standardized morphosyntactic tests, and in so called auditory age (AA) (7;5–9;4), namely with corresponding length of cochlear implant. Overall, as is the case with the different groups of NH children tested with the same test and as in all of the experiments reviewed for Italian and also for other languages, CI children have shown a better performance in the production of Subject relatives than of Object relatives. The different groups of NH children had a higher percentage of accuracy than the CI group for both types of relatives. A correlation has also been found in the production scores by CI children with the age of implantation and duration of the cochlear implant, but this only for Subject relatives; this is so since the production of Object relatives was extremely limited anyway, as in the familiar case. As for the types of structures produced when an Object relative was elicited, the most salient result of this study is that CI children appeared to have an intermediate behavior between the younger aged group LA and the matching age group CA: whereas the CA group resorted to the characteristic production of PORs in 42% of the cases, and the LA group did so in 14% of the cases, CI children reacted with PORs in 26% of their answers. Correspondingly, Object relatives were produced in 15% of the cases by CA children, in 33% of the cases by the LA group and in 23% of the cases by the CI group. Hence, CI children appear to have a more delayed development than CA children in this domain, but they tend to get to the same pattern. Overall, CI children have been less accurate and they have produced more ungrammatical non-target sentences than NH children of the different groups, especially so when the target sentence was an Object relative. For instance, sometimes the complementizer *che* was replaced by a different wh-word corresponding to the wh-word *where* as in: *Mi piace il bambino quello dove il papà lava*/ I like the child the one where the father washes. Notice that this type of answer may be

influenced by presence of the picture where the corresponding sentence was depicted; however, use of the wh-word corresponding to *where* has also been documented for younger children (Guasti & Cardinaletti 2003), and in other languages as well in HI children (e.g. use of *où* in French Delage & Tuller 2007; Guasti et al. 2014). The individual results indicated that not all of the CI children behaved in the same way: some did actually produce some target Object relatives and no POR at all, thus showing once again, a pattern resembling more the one of younger NH typically developing children (see also the discussion in 2.1).

iv.    Adult L2 speakers of Italian

A first pilot production study has been conducted with the same elicitation Preference task discussed in 2.1 on a population of 30 L2 speakers of Italian.[37] The general results indicated the L2 speakers did produce the elicited relative structures, with slightly better performance in the case of Subject relatives compared to Object relatives (93% vs 89%; the Object relative case is slightly less accurate, but the overall performance is almost at ceiling). The most revealing result, however, concerns the structures, which were produced when an Object relative was elicited, summarized in the following Table 5.10:

**Table 5.10.** Percentages of relatives produced when an Object relative was elicited

| Type of relative | Beginners | Advanced |
|---|---|---|
| Object relative (active) | **60%** | 15% |
| POR | 22% | **77%** |
| * | 18% | 8% |

The table reveals a sharp contrast, almost a reversed curve, between the group of beginners and the group of advanced L2 speakers: in the beginners case the somehow hardest structure, the active Object relative (in the majority of cases produced with a preverbal lexically realized subject), is accessed with a relatively high rate (60%), whereas PORs are produced at a much lower rate (22%). In contrast, PORs

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**37.**    15 L1 English, 3 L1 Mandarin Chinese, 2 L1 Spanish, 2 L1 French (of which one also speaks Kabiyè), 2 L1 Polish, 1 L1 German, 1 L1 Norwegian, 1 L1 Albanian, 1 L1 Magyar, 1 L1 Greek. Despite different L1, results and development are uniform across all of the L2 speakers. The L2 speakers have been dived in two main groups, Beginners and Advanced, according to their level of Italian as determined in language classes, which were attended up to 12 months by the first group and for more than 12 months by the second group.

We thank very much Antonio Migliore for collecting and analyzing these results in his MA thesis, University of Siena, 2011.

are produced at a very high percentage (77%) at the advanced level, approaching L1-Italian adults; at this level, Object relatives are fairly rarely produced (15%), again approaching the performance of L1-Italian adults. In both groups, there are also non-target productions, generally absent in the production of L1 speakers, which decrease as the level of the L2 develops further. These results suggest that passives may be relatively hard for the L2 population at the early stages of acquisition of Italian; it can be speculated that this is due to the general difficulty that L2 speakers typically encounter with the proper mastery of inflectional morphology. Thus, in these beginning conditions the adult L2 speakers rather access the complex Object relative computation more readily than PORs. However, as their level of Italian increases and passive morphology becomes more accessible, PORs become the clearly preferred computation, much as for L1-Italian adults and also for older children acquiring Italian, as discussed in 2.2. We can also note that children's early development illustrated by Figure 5.1 of Section 2.2, is almost matched by the development of the L2 population. It seems reasonable to speculate that this similarity may be due to (partly) different reasons: proper mastery of passive morphology in the adult L2 population vs overall availability of the computations implicated in passive in children. We leave this speculation at this tentative level. More L2 data are necessary to draw any reasonably firm conclusion and also to confirm the pilot findings.

## Summary and questions for future research

The chapter has reported on the fairly rich set of results on the acquisition in Italian of a notably cross-linguistically hard domain: the acquisition of relative clauses. The results reported have all coherently indicated, as one would expect, that Italian is no exception to this general crosslinguistic finding. Relative clauses are a complex structure to acquire, however, there is a crucial distinction to make: the really hard structure to acquire is Object relatives, since subject relatives are properly processed by young children acquiring Italian already at the earliest ages, between 3 and 4 years. This holds in both production and comprehension. The proper mastery of Object relatives takes much longer, and it may still not be at ceiling around age 9. However, not all object relatives are hard to be properly acquired; the really hard ones are lexically headed Object relatives with a (preverbal) lexical subject within the relative clause. This robust finding, which is the one holding cross-linguistically, has been traced back to a principled explanation under the proposal that the crucial locality principle constraining syntactic computations be responsible of the children's developmental difficulty. A residue of this difficulty can also be found in (slower) adult processing, as results in research from the psycholinguistic literature have repeatedly indicated. The relevant principle has been identified with featural Relativized Minimality, the

principle ruling out structures in which intervention of an element similar in relevant features to the target structurally intervenes in the construction of a long distance dependency. Following Friedmann, Belletti, Rizzi (2009), in the hard lexically headed object relatives a feature labeled [+NP] has been assumed to be shared by the lexical head and the intervening subject of the relative clause, which is at the origin of children's difficulty. Indeed, other types of Object relatives in which the hard intervention configuration does not hold are not difficult, and even young children do not have any problem in their proper mastery. This has been shown to be the case in the production of lexically headed object relatives with a pronominal subject in the relative clause.

The interpretation of the delayed development of object relatives in terms of the syntactic principle featural Relativized Minimality opens up the possibility that the features relevant to modulate intervention should be those triggering syntactic movement. Hence, this has generated subtle research questions in a number of studies, which have investigated the role played by morphosyntactic features such as gender and number. Results have shown that number mismatch between the lexical relative head and the intervening (preverbal) lexical subject does have an amelioration effect in the proper comprehension of object relatives at age 4; and even more so at age 5. In contrast, gender mismatch does not have the same effect in Italian: for children around age 5, comprehension remains low, often below chance, also in the gender mismatch condition.

Robust production results have indicated that children often resort to the production of a POR instead of the elicited active lexically headed Object relative; since Italian speaking adults have been shown to do so overwhelmingly, children's behavior appears to tend to conform to the adult's one, with increasing use of PORs as children grow older, clearly so after age 5. PORs of different types have been shown to be better comprehended than lexically headed Object relatives, also those containing a resumptive clitic, a structure present in children's spontaneous production. It has been shown that resort to POR is not an input effect, as these structures are very rare in spontaneous productions. Lack of intervention brought about by passive should then be at the origin of the systematic resort to this type of computation in elicited production and to the preference shown in comprehension.

Given the general difficulty with object relatives in typical development, it is not surprising that these structures are virtually impossible to master in the different forms of atypical development considered, for which data and experimental results are available. Rather, given the generally good performance of even young typically developing children with Subject relatives, difficulty in the proper mastery of (the easier) Subject relatives may be taken as an indication of atypical development.

The results presented in this chapter open up a number of new research questions, some of which have been mentioned in the course of the discussion, inspired

both by the data collected so far and by the account proposed which capitalizes on the principle ruling the intervention configuration under featural Relativized Minimality as hard or even impossible to master. Future work is needed on the crucial research question of which features are those relevant for the principle and how exactly they can express the observed developmental path. The number and types of features to investigate should be enriched and their study should be carried out in a cross-linguistic perspective; results from the comparative study between Italian and Hebrew has shown a different role of the very same feature, gender, in modulating intervention and thus in ameliorating children's comprehension of Object relative clauses. Hence, there must always be some caution in drawing general conclusions on the status of some morphosyntactic features with respect to the principle and cross-linguistic evidence must be gathered. A case in point is the animacy feature. The results presented for Italian suggested that manipulation of this feature may have a mild amelioration effect (especially at younger ages), but it does not lead to any significant improvement (at least in production). However, cross-linguistic evidence is needed, since it could be the case that the same animacy feature may have a different status with respect to featural Relativized Minimality in different languages. Results gathered from Italian development indicate the baseline in this language. More cross-linguistic evidence would also have an effect on the purely theoretical side of the issue, as it could shed light on the proper functioning of the locality principle responsible for adults' grammar and, as we have suggested, crucial to express development. A possible outcome of the newly foreseen cross-linguistic research could be that this feature in some other language be grammaticalized (as is known to be the case) and as such plays the morphosyntactic role of being a feature attracting syntactic movement (yet to be determined). If this were the case, the mild role played by the animacy feature in Italian development could be interpreted as the reflex of the status of this feature in some other language; an option that young children may explore to some extent and which might give to this feature a somewhat privileged status also in the Italian adults' grammar, still not assuming the decisive status of morphosyntactic feature triggering syntactic movement in this language. But all of this and much more has to be determined by new studies. In the same comparative vein, new studies should also verify whether also other features, e.g. abstract-concrete and many conceivable other ones may play a role in modulating intervention. The agenda is opened and waits for new results from acquisition, which will contribute to answer the family of questions raised.

The complexity of relative clauses in interaction with various properties of Italian has had the consequence that some of the described results presented in this chapter have some confound intrinsic to them. One case in point is the amelioration brought about by presence of a pronominal subject as the subject of a headed object relative and its post-verbal location when the pronoun is overt hence focalized. As already

mentioned in the presentation of the relevant results, it would be most welcome if this confound could be eliminated and the different conditions – overt vs null, pre- vs post- verbal – on the pronominal subject could be better teased apart. Again, this would directly contribute to the better understanding of the relevant principle(s) at play, which shape development in the way we have presented in the domain of the acquisition of Italian relative clauses.

CHAPTER 6

# The acquisition of Wh-questions

## 6.1 Introduction

Italian wh-questions generally display the order in (1), that is, the wh-element and the verb must be adjacent. In subject wh-questions, as shown in (1a), the order is the canonical order of Italian (SVO). In non-subject wh-questions, as shown in (1b–d), the subject typically comes at the very end of the sentence.[1]

(1) a. Chi ha mangiato la mela?
'Who has eaten the apple?'

b. Cosa ha fatto Gianni?
what has done Gianni?
'What has Gianni done?'

c. A chi ha dato un libro Gianni?
to whom has given a book Gianni?
'Who has Gianni given a book to?'

d. Quando ha parlato Gianni?
when has talked Gianni?
'When has Gianni talked?'

The position of the subject in a question is likely not the focus position that the post-verbal subject typically occupies in a declarative sentence (Belletti 2001b, 2004a). Although the position cannot be identified with a right dislocated position, it has been argued that the post-verbal subject is in a marginalized position (Antinucci & Cinque 1977; Guasti 1996b; Cardinaletti 2007) or in a low topic position (Belletti 2004) and is destressed. The adjacency requirement between the wh-element and the verb observed in (1) is removed in the case of *perché* (why). With this wh-element the subject can either be pre-verbal or post-verbal, as in (2) (Rizzi 1996).

(2) Perché (Gianni) ha dipinto la casa (Gianni)?
why (Gianni) has painted her house (Gianni)?
'Why has Gianni painted her house?'

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**1.** Questions like *Che cosa ha dato Gianni a Maria?* 'What has given Gianni to Maria' (What has Gianni given to Maria) with the PP complement surfacing after the subject are acceptable. It is likely that the PP here is marginalized or in a dislocated position.

As in declarative sentences, the subject of a question can be null, if this option is pragmatically appropriate. For first and second person, the use of null subjects is the unmarked option, as in (3).

(3)   Cosa hai fatto?
       What have (you) done?

Besides the order in (1), the order exemplified in (4) is also possible, with the subject in a left dislocated position before the wh-element. The question in (4) is pronounced with a short pause between the left dislocated subject and the wh-element, that is, in (4), the subject forms a prosodic unit on its own. In contrast, in (1b) there is no pause between the verb and the post-verbal subject.

(4)   Gianni, cosa ha fatto?
       Gianni, what has (he) done?

In spoken language, it is also possible to express a question through a cleft structure, as in (5). In this structure, the subject can stay either in a pre-verbal or in a post-verbal position, with the latter option being more natural.

(5)   Cos'è che (Gianni) ha fatto (Gianni)?
       What is it that (Gianni) has done (Gianni)?

Yes/no questions, instead, can display the same order of declarative sentences and they are distinguished from these by intonation. While a declarative sentence ends with a descending contour, an interrogative ends with an ascending contour.

Given the structure of Italian wh-questions, ambiguity can be observed when the verb is reversible, the subject is at the very end of the sentence and thus the sentence is with the typical order *Wh V N*, as exemplified below.

(6)   Chi ha richiamato il venditore?
       who has called-back the seller?

       Interpretation 1: 'Who called the seller?'
       Interpretation 2: 'Who did the seller call?'

Without a context, (6) is ambiguous: it can be a subject or an object question, as evident from the two English translations. This ambiguity stems from the fact that Italian subject and object questions display the same order, and the verb *ha richiamato* (has called-back) in (6) is reversible. Accordingly, *chi* (who) in (6) can be the subject or the object of the verb. Depending on whether (6) is a subject or an object question, the post-verbal NP stays either for the object or for the subject. Thus, a question like (6) can be disambiguated through the extra-linguistic context in which it is used. It could also be disambiguated through the linguistic-pragmatic context, e.g. if the question in (6) continues as in (7), it is no longer ambiguous (examples from De Vincenzi 1992).

(7)  a.   Chi ha richiamato il venditore, per chiedere uno sconto?   (SUBJECT Q)
          who called-back the seller, to ask for a rebate?

     b.   Chi ha richiamato il venditore, per offrire uno sconto?     (OBJECT Q)
          Who called-back the seller, to offer a rebate?
          'Who did the seller call-back, to offer a rebate?'

(7a) is a subject question, because typically, someone calls the seller to ask for a rebate, and (7b) is an object question, because the seller typically calls people to offer rebates. Disambiguation is brought about by the purpose clause. Subject and object questions can also be disambiguated when the wh-element and the post-verbal NP have different number features. Consider (8).

(8)  a.   Quali bambini tirano il cavallo?                     SUBJECT Q
          Which-masc-pl children pull-pl the horse?

     b.   Quali bambini tira il cavallo?                       OBJECT Q
          Which-masc-pl children pull-sg the horse?
          'Which children does the horse pull?'

(8a) is unambiguously a subject question with the verb agreeing with the plural phrase *quali bambini* (which children); (8b) is an object question with the singular verb agreeing with the singular post-verbal NP subject. *Which*-phrases in Italian can be singular and plural.[2] This is not so for the wh-element *chi* (who). A question like in (9a) is a subject question with the singular verb agreeing with the wh-operator and the post-verbal plural NP is the object. (9b) is an object question with the plural verb agreeing with the plural post-verbal subject. The wh-element *chi* is strictly singular and for the question to be interpreted as a subject question, the verb must be 3rd person singular.[3]

(9)  a.   Chi tira i cavalli?
          Who pulls the horses?

     b.   Chi   tirano   i    cavalli?
          Who   pull-pl  the  horses?
          'Who do the horses pull?'

---

**2.**  The *which*-phrase could also be singular as in (i). The verb agrees with the post-verbal NP and this is an object question.

     (i)   Quale bambino tirano i cavalli?
           Which-masc-sg child pull-pl the horses
           'Which child do the horses pull?'

**3.**  Ambiguity problems do not arise if the verb in the question is not reversible, as in the example in (1b) at the beginning.

Wh-questions feature a dependency between a wh-element in sentence initial position and a gap, annotated as ___ in (10), in the argument position within the clause. This dependency can be characterized in terms of movement of the wh-element to Spec, CP (or in some projection of the CP area). In (10a), we have the derivation of the subject question. In this case, the gap of the moved subject is in Spec, TP (or AgrSP or IP) and the movement is vacuous, as it does not alter the basic word order of Italian (SVO).[4] In (10b), we have a direct object question with the fronted *cosa* (what), the verb, the object gap and the subject. In (10c) we have an indirect object question with the gap after the direct object (in Italian, the unmarked order is direct object – indirect object).

(10)    a.   $[_{CP}$ chi___ ha mangiato la mela?]
             who ___ has eaten the apple?

          b.   $[_{CP}$ cosa ha fatto ___ Gianni?]
             what has done __ Gianni?

          c.   $[_{CP}$ A chi ha dato un libro ___ Gianni?]
             To whom has given a book __ Gianni?

As we said earlier, in Italian non-subject main questions, the subject must stay in the right periphery of the clause. Although Italian is an SVO language, the order *Wh S V* is either impossible (when the wh-element is bare) or highly dispreferred (when the wh-element is a *which*-phrase) (for discussion about the possible orders see Cardinaletti 2006; Greco 2013). Rizzi (1996) has formalized the adjacency requirement between the wh-element and the verb in terms of the wh-criterion. This is a universal well-formedness condition on the way wh-expressions are assigned scope and whose formulation is given in (11).

(11)   a.   Each Wh-operator must be in a Spec-head relation with a [+wh] $X^0$.
       b.   Each [+wh] head must be in a Spec-head relation with a Wh-operator.

In main questions, the [+wh] feature is generated on I and moved along with I (including the inflected verb) to C. In turn, the WH-operator raises to Spec, CP. As a result of these two movements, the [+wh] head (the verb) is in a Spec-head relation with the WH-operator and vice versa, as required by the two clauses of the WH-criterion. This is illustrated in (12b) for the question in (12a).

(12)   a.   Cosa prende Paolo?
           what takes Paolo?
           'What does Paolo take?'
       b.   $[_{CP}$ cosa$_j$ [prende$_i$ [$_{TP}$ Paolo t$_i$ t$_j$]]]?

---

4.   As Italian is a null subject language with post-verbal subjects, it is possible that subject extraction occurs from the post-verbal position, as in Rizzi and Shlonsky (2006). For simplicity, we assume the derivation in (10). See also Footnote 31 in Chapter 5.

Studies on the acquisition of wh-questions in Italian have shown that children from their first questions are able to perform wh-movement. They can produce a variety of non-ambiguous questions using various wh-elements (who, what, where, when, how, why) from age 2;0. However, their production and comprehension of object questions including reversible verbs are weak. At age 5;0, Italian-speaking children can produce subject and object questions including reversible verbs of the type in (9) and (10), but to a lesser extent than adult control subjects do. In addition, a clear subject advantage is observed. While subject *who*-questions are not challenging, object *who*-questions are. In comprehension, this tendency is exacerbated. At age 5;0, children's comprehension of object *who*-questions is very poor (around 50%) and it is only at age 10–11 that 80% accuracy is reached. Given these findings in typical acquisition, it is not surprising that questions are difficult for children with SLI and for children with Developmental Dyslexia (DD).

This chapter is organized as follows. In Section 2, 3 and 4, we investigate the acquisition of wh-questions in children with TD, both comprehension and production will be considered. We examine the production of wh-questions with irreversible verbs (Section 2) and with reversible verbs (Section 4) and the comprehension of questions with reversible verbs (Section 3). In Section 5, we put the Italian findings in a cross-linguistic perspective and in Section 6, we discuss a proposal about the source of difficulty underlying the acquisition of Italian questions. In Section 7, we discuss the hypothesis that *who*- and *which*-questions present distinct sources of difficulties and in Section 8, we report findings on the production of wh-questions in children with SLI and DD.

## 6.2    The L1 acquisition of wh-questions

Guasti (1996a) investigated the naturalist production of wh-questions, which comprised the natural production of 5 children (Calambrone corpus, Cipriani, Chilosi, Bottari & Pfanner 1993). In a period between 1;7 and 2;11, these children produced 296 questions with a fronted wh-element: 166 (56%) were null subject questions and 130 (44%) featured the presence of an overt subject, all in a right peripheral position. In addition, they produced 5 questions which were headed by *perché* (why) with the subject between the wh-element and the verb. This order is allowed in the adult grammar, as we said earlier. Thus, the order of words in early wh-questions is already the same as in the adult grammar.

This finding is confirmed by an additional elicited production study (Guasti 1996a). Here, 11 children between 3;1 and 4;8 were engaged in an elicitation task aiming at collecting positive and negative yes/no questions and positive and negative wh-questions extracting from different positions (i.e. subject, object and adjunct). The experimenter presented a story to each child and invited him/her to ask a question to

a puppet. In (13a) we give the lead-ins used to elicit an object question and in (13b) to elicit an adjunct question.

(13)  a. Exp:  Cè qualcosa che Paolo prende. Domanda alla lumaca cosa.
                'There is something that Paolo takes. Ask the snail what.'

      Target:  (che) cosa prende (Paolo)?
               (che) what takes (Paolo)?
               'What does Paolo take?'

      b. Exp:  Cè un posto dove il bambino non può andare. Domanda alla lumaca dove.
               There is a place where the child can't go. Ask the snail where.

      Target:  Dove non può andare (il bambino)?
               where NEG can go (the child)?
               'Where can't the child go?'

Through the experiment, 11 yes/no questions were collected, all displaying grammatical orders in Italian. In addition, 207 wh-questions (including 11 subject questions) were collected, all of which were grammatically correct. Questions extracting from the object or the adjunct position displayed various structures, listed in (14).

(14)  a.  Null subject questions
          Come ti chiami? (M., 4;4)
          how you call?
          'What is your name?'

      b.  Questions with left dislocation of the subject
          e lui, cosa fa lì da solo? (A., 3;1)
          and he, what makes there alone?
          'and he, what does (he) make there alone?'

      c.  Questions with the subject at the end of the sentence
          Cosa può fare il cowboy? (A., 3;1)
          what can do the cowboy?
          'What can the cowboy do?'

      d.  Cleft structures
          Chi è che può andare sull'altalena? (AR., 4;5)
          Who is that can go on the see-saw?
          'Who can go on the see-saw?'

In the case of questions headed by *perché* (why) and in the case of yes/no-questions the subject could either be pre-verbal or post-verbal. In the examples from children in (15) it is pre-verbal. Notice that it is only in the case of *perché* that the order *Wh S V* was found.

(15)  a.  Perché la bambina non vuole andare a scuola? (D., 4;7)
          why the girl NEG want go to school?
          'Why doesn't the girl want to go to school?'

b. Perché la signora non può bere il caffè senza zucchero? (A., 4;5)
   why the lady NEG can drink the coffee without sugar?
   'Why can't the lady drink coffee without sugar?'

c. Viene in su quello là? (F., 4;3)
   comes up the one there?
   'Does the one there come up?'

d. Quette, non gli piacciono? (G., 4;5)
   these, NEG to+him like-pl?
   'Doesn't he like these?'

The number and percentages of positive and negative non-subject questions produced by the group is shown in Table 6.1. The first column includes questions with pre-verbal subjects, the second questions with left dislocated subjects, the third with subjects at the end of the sentence; the fourth includes null subject questions, the fifth cleft structures. Structures that were not classified were not included.

**Table 6.1.** Frequency and percentage of positive and negative wh-questions produced by 11 Italian-speaking children (age range 3;1–4;8). *Wh S V* order was only observed with why-questions. Elicited production data from Guasti (1996a)

|  | WH S V | S Wh V | Wh V S | Null S | Cleft |
|---|---|---|---|---|---|
| Positive Q | 0 | 3 (3%) | 13 (15%) | 67 (77%) | 3 (3%) |
| Negative Q | 3 (2%) | 3 (2%) | 19 (16%) | 73 (64%) | 3 (11%) |

Therefore, both naturalist data and elicitation data prove that children have good command of the rules implicated in the formation of questions from about age 2;0 and they respect the licit orders in Italian and the adjacency requirement between the wh-element and the verb. They also know that they must front the wh-element, as no case of wh-in-situ is reported in any study on Italian. We can also conclude that they know that they have to move the verb to the C domain or can respect whatever requirement forces the subject not to intervene between the wh-element and the verb and be typically located at the end of the clause.

## 6.3 Comprehension of subject and object wh-questions

In previous studies, object questions included the wh-element *cosa* (what), subject questions contained the wh-element *chi* (who) and both featured the presence of irreversible verbs. In order to produce or understand this kind of questions, one needs to know the argument structure of the verb, the meaning of *who* and *what* (*who* stays for an animate entity and *what* for an inanimate one) and the link between these

wh-elements and the argument structure of the verb. Children from age 2;0 seem to master these pieces of knowledge.

In additional studies on comprehension and production, object wh-questions were introduced both by the wh-element *chi* (who) or *quale* (which) and included reversible verbs, as in (16) and (17). De Vincenzi, Arduino, Ciccarelli and Job (1999) tested children's comprehension of these questions. Three hundred and fifty-two children from 3;0 to 11;0, which were divided into 8 age groups, took part in the study, and were presented with 36 non-ambiguous reversible questions. De Vincenzi et al. presented children with pictures displaying three sets of characters, as shown in Figure 6.1, and asked them questions like in (16) or (17).

(16)  a.  Chi sta rincorrendo le tartarughe?          Subject who-question
          who is chasing the turtles?
          'Who is chasing the turtles?'

      b.  Chi stanno ricorrendo le tartarughe?        Object who-question
          who are chasing the turtles?
          'Who are the turtles chasing?'

(17)  a.  Quale gallina sta rincorrendo le tartarughe?   Subject which-question
          which chicken is chasing the turtles?
          'Which chicken is chasing the turtles?'

      b.  Quale gallina stanno rincorrendo le tartarughe?  Object which-question
          Which chicken are chasing the turtles?
          'Which chicken are the turtles chasing?'
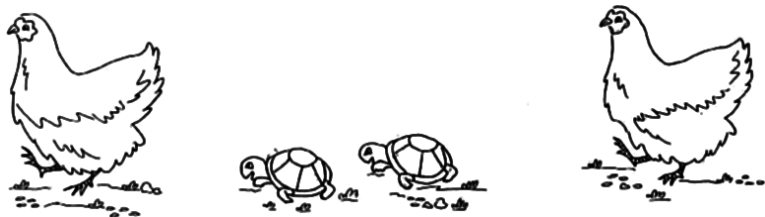


**Figure 6.1.**  Material used in De Vincenzi et al. (1999)'s experiment to test comprehension of wh-questions by Italian-speaking children

Children had either to point to the chicken on the right or on the left, depending on the question. Control questions were included to give children the opportunity to point to the middle characters.

Comprehension of reversible subject questions was already relatively good from 3;0–4;0; however, comprehension of reversible object wh-questions appeared to be extremely delayed, with only the oldest group (aged 10;0–11;0) displaying good

performance. Table 6.2 reports the percentage of correct responses of the groups of children for the four types of questions.

Table 6.2. Percentage of correct responses to reversible wh-questions (Example 16 and 17) by 352 Italian-speaking children (44 for each age group) as a function of question type (Subject vs. Object) and wh-type (*who* vs. *which*) (data from De Vincenzi Arduino, Ciccarelli & Job 1999)

| Age group | S who | S which | O who | O which |
|---|---|---|---|---|
| 3–4 | 64 | 75 | 53 | 45 |
| 4–5 | 83 | 83 | 56 | 38 |
| 5–6 | 90 | 92 | 54 | 39 |
| 6–7 | 97 | 98 | 50 | 36 |
| 7–8 | 97 | 97 | 54 | 47 |
| 8–9 | 96 | 99 | 60 | 52 |
| 9–10 | 97 | 98 | 58 | 53 |
| 10–11 | 97 | 99 | 89 | 81 |

In all age groups, subject questions were easier than object questions. While children were almost at ceiling in the comprehension of subject questions (both *who*- and *which*-questions) from age 5;0, they moved toward a ceiling performance (80% accuracy) in the comprehension of object questions at age 10;0–11;0. In addition, a statistical difference was observed between object *which*- and object *who*-questions in the groups 4–5, 5–6 and 6–7, with the former being harder than the latter. In the other groups, instead, no difference was evident. These findings are in striking contrast to previous results based on production reported in Section 2: children from age 3;5 on were adult-like in the production of a range of questions, including object questions, as established through the elicited production experiment, but even from age 2;0 on they spontaneously produced object questions. There are two caveats. First, although production and comprehension are related they are likely to involve different processes. Production is under the speaker control, namely, the speaker decides which structure to use and how to express a concept, while comprehension is not controlled by the hearer. In addition, there is one major difference between the questions used in the comprehension study and the questions produced in the elicitation experiment reported in Section 2: the verbs were all reversible in the former case, while they were irreversible in the latter. De Vincenzi et al. pointed out that reversibility per se cannot be a problem, as in a standardized test for comprehension of the Italian grammar (TCGB, Chilosi & Cipriani 2006) children at age 6;0 understood reversible passive sentences correctly 95% of the time. Thus, it appears that passives

are comprehended earlier than object questions in Italian. This is coherent with the discussion in Chapter 4 on passives. Additional evidence that reversibility *per se* cannot be the problem comes from studies on other early languages. First, Avrutin (2000) established that 4;3 year old English-speaking children were equally good in comprehending subject and object *who*-questions including reversible verbs (80% correct responses in both cases). The same result is confirmed by Hirsch and Hartman (2006). Similarly, Yoshinaga (1996) found that, in the production of object *who*-questions with reversible verbs, English-speaking children did not have problems at age 5;0. Interestingly, Avrutin also found that the same English-speaking children understood object *which*-questions less well than subject *which*-questions (48% correct versus 86% correct responses). Thus, a subject/object asymmetry is evident in English only in the case of *which*-questions at the age of 4;3. Friedmann, Belletti and Rizzi (2009), replicated the comprehension result with 4;3 year old Hebrew-speaking children: object *which*-questions elicited 58% correct responses while subject *which*-questions 78%. These findings raise the question of why in Italian the comprehension of questions headed by *who* and *which* is so delayed compared to other languages. This issue was investigated through a study on the production of reversible wh-questions, which is introduced in the following section.

## 6.4  Production of subject and object questions with reversible verbs

To explore the delay in the comprehension of object questions by Italian-speaking children, Guasti, Branchini and Arosio (2012) engaged thirty-five 4;0–5;0 year-old Italian-speaking children (mean age 4;10) in an elicitation task aimed at leading them to produce subject and object questions, introduced by *who*- or *which*. All questions included reversible verbs (in many cases the same used in the comprehension experiment by de Vincenzi et al. 1999) and all questions were unambiguous. This was achieved by manipulating the number features on nouns staying for the agent and the patient; when the agent was plural, the patient was singular and vice versa. In addition, 20 adult controls were also tested. Children and adults were presented with pictures like in Figure 6.2, through a laptop computer. One character was covered and the two others were performing some action to it. A puppet was used that had to guess who was covered. While watching the picture, a pre-recorded voice introduced with a brief description the scene as in (18).

(18)  Guarda. Ci sono due orsi che legano qualcuno. Lui sa chi. Domandagli chi
Look here. There are two bears that tie someone. He knows who. Ask him who.

Target:  Chi legano gli orsi?
'Who do the bears tie?'
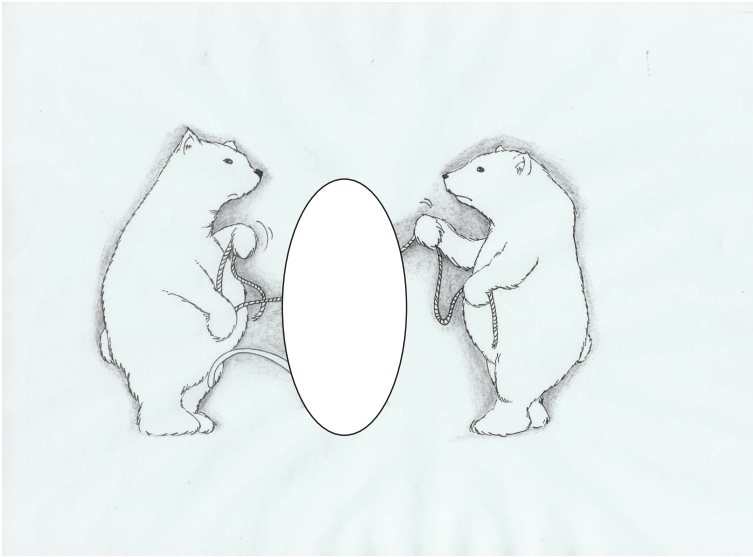
**Figure 6.2.** Material used to elicit wh-question in Guasti et al. (2012)'s study

After the child had addressed the question to the puppet and the puppet had answered, the covering disappeared and the hidden character became visible, so that the child could establish whether the puppet had answered correctly or not. The procedure to elicit *which*-questions required the use of an additional picture, in which the relevant characters were introduced, in order to meet the pragmatic conditions for the use of such type of questions. For example, in one picture there were two football players, one with a red shirt and the other with the blue shirt, and one cook. These characters were all verbally described. In the second picture, only the cook was visible and children were told that the cook was saying good-bye to one of the football players and we wanted to know from the puppet which football player was. The experiment was quite successful in eliciting 656 correct questions from children (each child had to produce 24 questions) and 434 for adults. Incorrect responses were 183 for children and 46 for adults. Although children made more errors than adults, they produced a lot of *wh*-questions. Table 6.3 reports the percentages of subject and object questions produced by children and adults as a function of the *wh*-element.

Beyond the difference between children and adults, the statistical analysis of the data revealed that children were better in subject than in object questions, but this held true only in the case of *who*-questions. In the case of *which*-questions, the asymmetry disappeared, as subject *which*-questions were also demanding. *Which*-questions were more difficult than *who*-questions and no asymmetry was evident between object *who*- and *which*-questions. Comparing the results in Table 6.3 and those in Table 6.2, it is clear that children (age 4–5) produce more object questions (71% and

**Table 6.3.** Percentage of correct subject and object questions produced by 35 Italian-speaking children and 20 adults as a function of extraction site (subject = S or object = O) and wh-element (*who* or *which*). Mean age of children 4;10. Elicited production data from Guasti, Branchini and Arosio (2012)

| | PRODUCTION RESULTS | | | |
|---|---|---|---|---|
| | **WHO-S** | **WHICH-S** | **WHO-O** | **WHICH-O** |
| Children | 88 | 80 | 71 | 73 |
| Adults | 98 | 83 | 93.5 | 85 |

73%, respectively) than they comprehend (56% and 38%, respectively). We return to this asymmetry later. The most interesting aspect of this study, however, is the kind of structures produced. Table 6.4 offers a breakdown of the various structures produced by children and adults.

**Table 6.4.** Percentage of correct subject and object questions produced by 35 Italian-speaking children and 20 adults as a function of extraction site (subject = S or object = O) and wh-element (*who* or *which*) and type of structure produced. Mean age of children 4;10. Elicited production data from Guasti, Branchini & Arosio (2012)

| Type of structure | Type of questions | Children | Adult |
|---|---|---|---|
| WH V N | WHO-S | 73% | 92% |
| | Who-O | 38% | 83% |
| | Which-S | 91% | 93% |
| | Which-O | 30% | 60% |
| S-left dislocation | WHO-S | | |
| | Who-O | 20% | 2% |
| | Which-S | | 0.9% |
| | Which-O | 21% | |
| Null argument | WHO-S | 3% | 0.8% |
| | Who-O | 30% | 0.8% |
| | Which-S | 7% | |
| | Which-O | 46% | |
| Passive | WHO-S | | 5% |
| | Who-O | | 14% |
| | Which-S | | 0.6% |
| | Which-O | 6% | 14% |

*(Continued)*

**Table 6.4.**  (Continued)

| Type of structure | Type of questions | Children | Adult |
|---|---|---|---|
| Cleft | WHO-S | 24% | 0.8% |
| | Who-O | 13% | 0.8% |
| | Which-S | 3% | 3% |
| | Which-O | 2% | |

For subject questions, children and adult produced the structure exemplified in (19) displaying the SVO order.

(19)   Chi   lega   le   cavallette?
       who   ties   the   grasshoppers?
       'Who ties the grasshoppers?'

Instead, for object questions, a variety of structures were used, all of which were correct. Beyond the structure with the post-verbal subject in (20a), the structure with left dislocation of the subject (20b) and with a null subject (20c) were employed. Although structures equivalent to (20b–c) could also have been used to form subject questions (with an object clitic included, as in *Gli orsi, chi li lega?* (Lit. The bear, who them ties?, "The bears, who ties them?"), they were not.

(20)   a.   Chi   legano   gli   orsi?
            who   tie-pl   the   bears?
            'Who do the bears tie?'

       b.   Gli   orsi,   chi   legano?
            the   bears,   who   tie-pl?
            'The bears, who (do they) tie?'

       c.   Chi   legano?
            who   tie-pl?
            'Who (do they) tie?'

Another finding was that children sometimes split the *which* NP, by producing questions like in (21), which are perfectly grammatical in Italian.

(21)   Il cuoco, quale sta salutando dei calciatori?
       the cook, which is waving of the football players?
       'At which of the football players is the cook waving?'

Children sometimes changed the *wh*-element *who* into *what*. These questions are structurally correct (the order of words is correct), but the features of the *wh*-element have been changed from animate to inanimate (as e.g. in *Cosa legano gli orsi*, What do the bears tie? rather than *Chi legano gli orsi?* Who do the bears tie?). In addition,

children used cleft structures for both subject and object questions. When used for object questions, the subject could be in the post-verbal position, in the pre-verbal position (something that is not possible in simple questions) or null, as in (22). However, most of the time, the subject was in the post-verbal position. Thus, cleft structures most of the time displayed the order Wh (is that) V N, for both subject and object questions.

(22)   Chi è che (gli orsi) legano (gli orsi)?
      who is (it) that (the bears) tie-PL (the bears)?

Adults displayed a different behavior in the case of object questions: they produced passive object questions of the type in (23).

(23)   Chi è legato dagli orsi?
      Who is tied by the bears?

Finally, children made errors. For example, they produced subject rather than object questions. The target object question in (24a) was turned into a subject question in (24b), by changing agreement on the verb.

(24)  a.  Quali bambini tira    la   fatina?
           which children pull-sg the fairy?
           'Which children is the fairy pulling?'

      b.  Quali bambini tirano la fatina?
           which children pull-pl the fairy?

Other incorrect answers included the production of only the *wh*-element or the production of structures other than questions. The results of Guasti et al.'s (2012) study indicate that:

1. Italian-speaking children can produce subject and object *wh*-questions including reversible verbs at age 4;0–5;0;
2. Object *who*-questions are more difficult than subject *who*-questions;
3. There is no asymmetry between subject and object *which*-questions;
4. There is no asymmetry between object *who*- and *which*-questions;
5. *Which*-questions are more difficult than *who*-questions.

## 6.5  Some reflections of comprehension and production of Italian wh-questions in a cross-linguistic perspective

We started with the question of why Italian-speaking children are delayed with respect to English- or Hebrew-speaking children, especially in comprehending object *who*- and *which*-questions. This question becomes even more notable, as Italian-speaking

children produce a fair amount of questions, the most popular structure for subject questions being Wh V N. This structure is also used to express object questions, but other structures are also employed. Notice that the structure that was employed in comprehension experiment by De Vincenzi et al. (1999) for both subject and object questions was WH V N. To get a quick view of the findings, we have summarized the percentage of comprehension and production of subject and object *who-* and *which-* questions in Table 6.5. In the case of production, we report the percentage of production of all structures together and of the Wh V N structure separate. In the latter case, between parentheses, we indicate the percentage of production of cleft structures, which also display the order Wh (is that) V N.

**Table 6.5.** Percentage of correct questions produced and comprehended by Italian-speaking children at age 4–5. Production questions are reported in two ways; in the first raw, we report the percentage of all structures together and in the second raw, we report the percentage of only the Wh V N structure (in parentheses, we report the percentage of cleft). Production data are from Guasti, Branchini and Arosio, (2012) and comprehension data are from De Vincenzi et al. (1999)

|  | WHO-S | WHICH-S | WHO-O | WHICH-O |
|---|---|---|---|---|
| ITALIAN-production (all structures) | 88 | 80 | 71 | 73 |
| ITALIAN production (structure WH V N) | 73 (24) | 91 (3) | 38 (13) | 30 (2) |
| ITALIAN-comprehension | 83 | 83 | 56 | 38 |

If we examine the results together in Table 6.5, we observe that the production rate of the structure WH V N used in comprehension was 38% (plus 13%) and 30% (plus 2%) for *who-* and *which* questions, respectively. These percentages align well with those obtained in comprehension. Thus, when we compare the same structure there is no longer an advantage for production. The advantage is apparent only if the whole set of structures produced is considered. A fair conclusion is that Italian-speaking children are equally challenged by the Wh V N structure both in comprehension and production, but this challenge is more evident in the former modality that in the latter one, because in production, children are guiding the race and can choose alternative grammatical structures. This hypothesis generates the prediction that children should comprehend the other structures they produced well. This remains to be tested.

Another point of cross-linguistic relevance needs to be addressed. Earlier we noticed that 5-year-old English-speaking children and Hebrew-speaking children obtained higher scores in the comprehension of object *who*-questions than in the comprehension of object *which*-questions. At the same age, De Vincenzi et al. (1999) reported an asymmetry in Italian as well, but the scores were lower than those in the other two languages. For example, Hebrew score for comprehension

of object *who*-questions was 81% and of object *which*-questions was 58%. Scores for Italian were 56% and 38%, respectively. We think that the source of the different scores obtained by Italian- and Hebrew-speaking children is the fact that a common structure for subject and object questions in Italian is Wh V N. This fact blurs the object *who* versus *which* asymmetry, which is also present in Italian comprehension, at least at age 5. The fact that in production this asymmetry is not evident in Italian raises the question of what happens in other early languages, such as English and Hebrew. We know that English-speaking children at age 5 produce object *which*-questions without trouble, as shown by Thornton (1995). However, we do not know whether there is any asymmetry between the production of subject and object *which*-questions or of object *who-* and *which*-questions at that age, as this was not the focus of that study. This is an issue for future research.

## 6.6 Why are Italian wh-questions hard?

We established that object *who-* and *which*-questions are harder than subject questions for Italian-speaking children. The locus of the difficulty is the presence in Italian of the structure Wh V N, i.e. of the fact that subject and object questions may have the same structure with the post-verbal N being either the object or the subject, respectively. There is no asymmetry between comprehension and production, once we compare the same structure, Wh V N, in the two modalities. The only difference that remains is due to the fact that children produce alternative structures. As for the cross-linguistic dimension, the difference between Italian and the other languages is essentially due to the presence in Italian of the Wh V N structure.

De Vincenzi et al. (1999) accounted for the difficulties with object questions in terms of processing. They assumed that the Minimal Chain Principle (MCP) (De Vincenzi 1991) operate in child and adult processing of sentences. According to the MCP, the parser attempts to interpret a moved element as soon as possible to avoid keeping it in memory for a long time due to economy reasons. If the initial analysis is not confirmed by further incoming material, reanalysis must apply. In (25a, b) *chi* (who) leads one to postulate a gap in the pre-verbal subject position and to link it to its antecedent, *chi*. This chain is assigned the subject function, case and an Agent thematic role. This choice is economic, as *chi* is interpreted immediately.

(25)   a.   $\text{Chi}_i$ ___$_i$ rincorre le tartarughe? (chi, ___) = Agent/Subject, Nominative
             Who chases the turtles?

       b.   $\text{Chi}_i$ ___$_i$ rincorrono le tartarughe? (chi, ___) = Agent/Subject, Nominative
             who chase-pl the turtles?
             'Who are the turtles chasing?'

When the verb *rincorre* (chases) is heard in (25a), the analysis is confirmed and thus comprehension proceeds smoothly. By contrast, when in (25b) the verb *rincorrono* (chase-pl) is heard, an incongruence between the feature of the verb (plural) and the feature of the *wh*-operator (singular) is detected. This leads one to reanalyze the previous assignment of the grammatical function, the thematic role and the case to the element *chi*. The subject trace is canceled and an object trace has to be postulated, instead; in addition, the chain must be reassigned a new grammatical function, thematic role and case. De Vincenzi et al. concluded that Italian-speaking children follow the MCP and interpreted subject questions correctly. However, they misinterpreted object questions, because they attempted to postulate a subject gap, thus obeying the MCP, but failed to revise the initial incorrect analysis, at least up to age 10;0–11;0.[5]

Although this account explains the comprehension facts, it does so less well in the case of the production facts. Specifically, it can explain the subject/object asymmetry in the production of questions, but it cannot explain why Italian-speaking children resorted to different structures specifically in the case of object questions and it cannot account for the form of the errors that they produced. To account for these additional pieces of data, Guasti et al. (2012) proposed the Agree interference approach (AIA). This analysis builds on insights from Guasti and Rizzi (2002), further developed in Franck, Lassi, Frauenfelder and Rizzi (2006). In this approach, the subject-verb agreement relation plays a key role, as agreement is crucial to decide whether a subject or an object question is intended in Italian.

Franck et al. proposed that agreement, a process occurring at the interface between syntax and morphology, may occur in two steps: AGREE and Spec-Head agreement. AGREE is the operation whereby the subject in the specifier of the vP (see Koopman & Sportiche 1991) copies its person and number features into the inflectional node AgrS above it, under c-command and in a local configuration, as displayed in the lower portion of (27a). Spec-Head agreement is an additional operation of verification, ensuring that the subject and the verb share the same features. It only occurs when the subject

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**5.** De Vincenzi et al. (1999) noticed that passives, which also involve movement and reversibility, are less difficult than object questions at age 5;0. They explained the discrepancy between passives and object questions by assuming that when the first NP of a passive sentence is heard, it is assigned the grammatical function subject, nominative case and the thematic role Agent. Upon encountering the verb and retrieving its argument structure, assignment of the grammatical function and case is confirmed (the subject remains a subject and is still assigned nominative), but assignment of the thematic role has to be revised. Revision involves the postulation of a gap in object position, formation of a chain connecting the initial NP with its gap and re-assignment of a thematic role to the chain. De Vincenzi et al. suggested that the revision process was simpler in the case of passive (revision of only the thematic role) than it is in the case of object questions (revision of thematic role, case and grammatical function). This difference should be responsible for the fact that children at age 6;0 comprehend reversible passives, but not reversible object questions.

moves from vP to Spec AgrS and in that position establishes a Spec-Head relation with the inflected verb in AgrS, as displayed in the upper part of (27b). Thus, in sentences with the SV order, agreement is obtained by AGREE, MOVE (of the subject), and Spec-Head, while in sentences with the VS order agreement is obtained solely from AGREE.

(27) a.



b.
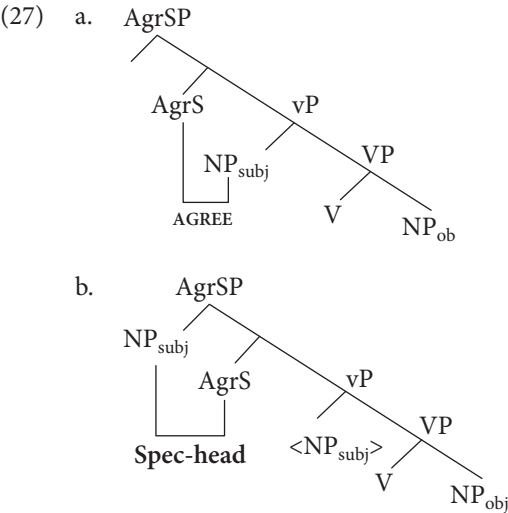


Let us now see how this proposal fares with the production of Italian wh-questions. We start with object questions. There are reasons to assume that object movement to the left periphery, as in questions, is stepwise and proceeds with a preliminary movement to an intermediate projection above vP (e.g. AgrOP; Kayne 1989; Chomsky 1995, see Chapter 3). When AgrS looks for a goal in its c-command domain, it first finds the object in Spec AgrOP, which can sometimes erroneously value AgrS and pass its features to it. Thus, the occurrence of the object *wh*-element in AgrOP interferes in the AGREE relation between AgrS and the subject in Spec vP. This is displayed in (28).

(28)
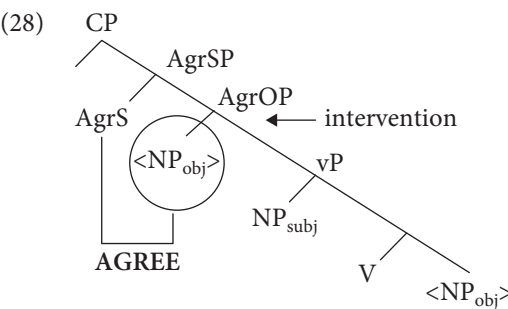


In object questions with a post-verbal subject, nothing else happens. This entails that if the object copy has erroneously valued AgrS, the object question looks as a sub-

ject question and this was one of the errors found in children's production (of course one does not know whether the intended question is a subject or an object question; we merely notice that the output will look like a subject question). When the subject occurs in a pre-verbal position, i.e. it has moved out of the vP to Spec AgrSP, agreement is further checked in the Spec-head configuration by verifying that the subject and the verb share the same features. In this way, (most of the) agreement errors created during AGREE are purged. This second part of the agreement process is meant to explain the various shapes that object questions take in Italian child grammar. They can be seen as ways to correct the errors originated during AGREE and to strengthen the agreement relation, which is crucial in Italian questions. Let us see how it works. In Italian *wh*-questions, the *wh*-element must be adjacent to the verb, as we said in the introduction. In other words, Spec AgrSP (or IP) is forbidden to lexical subjects, as shown in (29) (see Rizzi 1996; Cardinaletti 1997; Greco 2013).

(29)    *Chi i cavalli mordono?
        Who the horses bite?

However, Spec AgrS is available to phonologically null subjects, as shown in Cardinaletti (1997). Based on this, Guasti et al. (2012) argued that questions featuring null subjects or left dislocation of the subject (also called NP-topicalization) are questions featuring both the presence of a null subject in Spec AgrS and an optionally left dislocated subject (which can be left unpronounced in the case of null subject questions, see Belletti 2005), as in (30).

(30)    a.    Chi [$_{\text{AgrSP}}$ pro mordono] ?
              who bite-pl?
              'Who (do they) bite?'

        b.    I cavalli, chi [pro mordono]?
              the horses, who bite?
              'The horses, who (do they) bite?'

In these structures, the null subject is in a Spec-Head relation with AgrS and verifies the agreement features, thus allowing the correction of errors stemming from AGREE (for an analysis of left dislocation, see Belletti 2005; Cardinaletti 2007; and Cecchetto 2000).[6]

Under this approach, either intervention does not give rise to agreement errors, in which case the Wh V S structures is produced. If agreement errors occur, there are two

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**6.**    Guasti et al. (2012) extended Cecchetto's (2000) analysis of left dislocation. In this analysis, left dislocation is derived by movement of a big DP including the NP-subject and the null subject, which acts like a clitic. The null subject is moved to Spec AgrSP and the NP is moved in the left periphery of the clause.

options: either an incorrect wh-question is produced or the second step of the agreement process occurs and questions with null subject or left dislocation of the subject ensue.[7] Although adults produced more questions with the Wh V S order, they were also challenged by the interference of the object in the AGREE relation, witnessed by the fact that they produced a certain amount of passive object questions. This result is similar to that obtained in the elicitation of object relative clauses (see Chapter 5). When prompted to produce an object relative clause, both adults and older children produced passive object relative clauses. Passive object questions (POQ) can also be viewed as a radical way of eliminating the interference problem, as we assumed for relative clauses. In fact, under any analysis, passive clauses include a single argument (Jaeggli 1986; Baker et al. 1989; Collins 2005; Gehrke & Grillo 2008). For concreteness, assume the smuggling account of passive already adopted in Chapter 4 (see reference cited there; see also Chapter 5). POQs are derived by smuggling of the VP including the verb and the internal argument to a position above vP, as illustrated in (31).

(31)   Chi [$_{Agrs}$ è] [$_{VP}$ legato ⟨chi⟩ da [$_{vP}$ gli orsi ⟨VP⟩]?
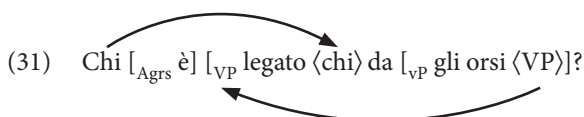
   Who is tied by+the bears?

In (31), when AgrS looks for a goal, it only finds the internal argument (the wh-element *chi*) that copies its features into AgrS and then moves to CP. In this way, a POQ or a correct passive subject rather than an active object question is produced. Passivization is not exploited by younger children, as it is known that young children have trouble with passives (Borer & Wexler 1987 and the reference cited in Chapter 4). We expect that older children will produce passive object questions, as they do for object relative clauses (Chapter 5).

   Subject questions are not problematic because when AgrS looks for a subject to agree with there is only one candidate: the subject in Spec vP.

   Both subject and object *which*-questions were difficult for children speaking Italian and no asymmetry was observed in their production. We think that this is due to additional sources of complexity featured by these questions. On the one hand, movement of the *which*-phrase is more complex as it involves pied piping of the nominal element. On the other, both the *which*-element and the N-element display agreement features and have to agree. In addition, in subject question the *which*-phrase has to agree with the verb. Agreement per se cannot be a problem, as Italian-

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7.   Cleft questions occurred both with subject and object questions and this suggests that they are not specific ways to deal with the interference problem. Moreover, cleft object questions had the subject in the post-verbal position most of the time and were assimilated to Wh V S.

speaking children master determiner-noun agreement and subject-verb agreement around 2–3 years (see Chapter 1). What may be demanding for children and exceed their computational capacity is the whole set of processes to be performed: agreement among various elements plus pied piping. This conjecture is supported by the avoidance of pied piping and production of questions featuring a split between *which* and the Nominal part (see (21)).

So far, we have examined cases of interference due to a DP copy that only differs from the goal in terms of number features. In Section 2, we have seen that *wh*-questions with an inanimate object are not problematic for Italian children (see (32)). These object questions also display the order Wh V S. Within the approach we have adopted, the lack of subject/object asymmetry can be explained as follows. Although *cosa* (what), while moving to Spec CP, goes through a position (Spec AgrOP) where it intervenes in the AGREE relation between AgrS and the post-verbal subject *il bambino* (the child), it is endowed with [-animate] feature. If animacy is a feature associated with AgrS (as it is in some languages, e.g. Georgian (see Harris (1981:149)), then AgrS would look for an animate goal and *cosa* (the object), being [−animate], is not an eligible goal and does not create interference.

(32)    Cosa vuole il bambino?
        what wants the child?
        'What does the child want?

Notice that the lack of asymmetry in these cases is hard to capture by the MCP, as a trace needs to be postulated both when the *wh*-question is introduced by *chi* (who) as well as when it is introduced by *cosa* (what).

In sum, object questions are challenging in Italian because the object copy intervenes in the AGREE relation. Errors ensuing in this process can be fixed by the additional Spec-Head agreement checking, which occurs if the subject moves to Spec AgrS, an optional process in Italian. When this additional process occurs, we obtain questions with a null subject or with left dislocation of the subject; when it doesn't, we obtain questions with the post-verbal subject or incorrect questions (if the object copy values AgrS). Finally, intervention can be radically removed by turning to passive object questions, an option mostly exploited by adults. Subject questions are not problematic, because nothing intervenes in the AGREE relation in this case.

We have described this process with reference to production, but it can be extended to comprehension as well (Guasti, Stavrakaki & Arosio 2012). During comprehension, children have to reconstruct the underlying structure from what they hear. In particular, they have to perform the AGREE relation and, in the case of object questions, they have to face the interference of the object copy. If something goes wrong in the AGREE process, i.e. the object trace values AgrS, children end up understanding the question as a subject question. There is an asymmetry between comprehension and

production that can be reduced to the fact that in production, children can venture to produce other structures and purge the errors, but in comprehension the errors cannot be fixed. Cross-linguistic differences are to be attributed to the fact that in Italian movement of the subject is not compulsory and object questions resulting only from the application of AGREE are common.

## 6.7    How many interference processes?

In Chapter 5 on relative clauses, we propose that the pre-verbal DP subject endowed with the +NP feature intervenes between the relative head and its copy, as schematically represented in (33a). Intervention in the configuration in (33) is responsible for children's failure to comprehend Object relatives with a pre-verbal subject.

(33)  a.    +R, +NP        +NP

b.    Il bambino che la mamma bacia
the child that the mother kisses
'the child that the mother kisses'

For Hebrew, Friedmann et al. (2009) have also shown that if the relative head does not have the +NP feature (as in free relatives) or if the subject does not have the +NP feature (as in relatives with an arbitrary *pro* subject), children's comprehension is accurate. Thus, the presence of the NP feature is crucial. Friedmann et al. extended their approach to *which*-questions. Consider the English example in (34), with the abstract representation of relevant features.

(34)    Which child does the mother kiss ⟨which child⟩?
+Q +NP            +NP

Similar to (33), the subject endowed with the +NP feature disrupts the local relation between the *which*-phrase and its trace or copy. This move allowed the authors to account for the fact that *which*-object questions are more problematic than *which*-subject questions in English and Hebrew. In the same vein, they explained the lack of asymmetry in English and Hebrew *who*-questions: *who* does not have a +NP feature and thus the intervening subject and the moved element do not share any features, as illustrated in (35).

(35)    Who does the mother kiss?
+Q        +NP

However, this explanation cannot do justice to the full array of facts that we know. First, Italian *who*-questions display a subject/object asymmetry; second, before age 4, this asymmetry is observed in English production (Yoshinaga 1996) as well. Hence,

one has to acknowledge that some other factor is responsible for the asymmetry in *who*-questions; this factor ceases to be operative in English at age 5, but at the same age is still operative in Italian and it must be distinct from that uncovered by Friedmann et al. For one thing, the factor involved in *who*-questions is operative in English for a shorter time than the additional factor responsible for children's difficulty with object *which*-questions. As we have seen, Guasti et al. (2012) proposed that this factor consisted in the violation of locality in the AGREE relation, i.e. the intervention of the object copy in the AGREE relation. Thus, we must acknowledge the presence of two interference processes: the interference in the AGREE relation and the interference of the NP subject between *which* NP and its copy.

In a developmental perspective, we can propose that initially children have trouble with object *wh*-questions (including reversible verbs) because of the intervention of the object copy in the AGREE relation and of the failure to raise the subject to Spec AgrS in *wh*-questions. Likely, facing these processes exceeds children's capacities. Hence, children fail to produce (and likely comprehend) object questions up to age 4–5. This holds true in Italian, English (based on Yoshinaga 1996) and likely Hebrew (for which data are not available). However, in English and Hebrew, movement of the subject to Spec AgrSP is compulsory and, as children grow older, their computational resources increase; this put them in a position to check agreement for a second time across the board, hence also in *wh*-questions. Therefore, around age 5, *who*-questions are no longer a problem for English- and Hebrew-speaking children, because the effects of interference in the AGREE relation can be fixed, as Spec Head is independently required in the language. In Italian, at age 5, *who*-questions may remain difficult, because Spec Head agreement is not compulsory and only AGREE may apply. Italian-speaking children have the computational resources necessary to compute the additional process of Spec Head agreement, as proven by the fact that they do, when they produce null subject questions and questions with a left dislocated subject. However, they do not always perform this additional process and may produce a subject rather than an object question.

At age 5, when children have overcome problems with AGREE in English and Hebrew, there is another threat and here is where Friedmann et al.'s account comes in. This time, it is the pre-verbal subject with a subset of the feature of the wh-phrase that makes object *which*-questions challenging.

In summary, there are at least two processes in the generation of an object question that violates strict locality operations: one is interference of the object copy in the AGREE relation (between AgrS and the post-verbal subject) and one is interference in the chain connecting the moved wh-element and its copy (the pre-verbal subject). These processes are independent, operate at given times in development and are regulated by language specific properties. For example, compulsory application of movement of the subject to the pre-verbal position pave the way for Spec Head agreement

in addition to AGREE and this frees children from problems in the application of only AGREE.


## 6.8 Wh-questions in children with SLI or Developmental Dyslexia

Guasti, Branchini, Vernice, Carravieri and Arosio (submitted) investigated the production of questions in 7-year old children with SLI. They found that *wh*-questions are challenging for them. These children produced less questions (both subject and object) than chronologically age (CA) matched and Language age (LA) matched children, but similar tendencies were evident in all groups. In particular, subject questions had the order Wh V O (see (19)). Object questions with the order Wh V S (Target questions) were also found, but often other structures were used (see (20)): object questions displaying left dislocation of the subject or featuring a null subject (N_Target questions). In addition, for *which*-questions, children with SLI split the *wh*-element and the N-part (see (21)). Thus, children with SLI displayed the same patterns observed in previous sections during typical development. Figure 6.3 depicts the percentages of the structures produced. Target-questions are those with the order Wh V O/S and N_target questions are correct questions featuring left dislocation of subjects, null subjects, passives. Errors were of three types: (1) agreement errors; (2) change of the *wh*-element *chi* (who) into *cosa* (what)[8] (3) other errors (use of the *wh*-element alone, production of a declarative, irrelevant questions). Agreement errors resulted in object questions being turned into subject questions (see (24)).

Children with SLI were particularly taxed in the formation of object questions and a clear subject/object asymmetry was observed but only in the case of *who*-questions. Subject and object *which*-questions, instead, were equally challenging (see later for discussion of this issue). Children with SLI made more errors than control children. In particular, they made more agreement errors than CA matched children, but not than LA matched children. This observation square well with the observation reported in Chapter 1, whereby 5-year-old children with SLI have problems with 3rd person plural morphology. In questions, children with SLI had problems when they had to produce questions with 3rd person plural verbs, which were changed into 3rd person singular verbs. Thus, it appears that the processing of agreement is demanding for children with SLI, but not more than it is for LA matched children, that is, their ability to compute

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**8.** In Guasti et al. (2012), questions introduced by *cosa* (what) rather than *chi* (who) were included among correct questions, as the structure was indeed correct. However, this choice may not do justice to the fact that the use of *what* is indeed an indication of a difficulty with the feature ± animate.

**Percentages of correct questions and errors**
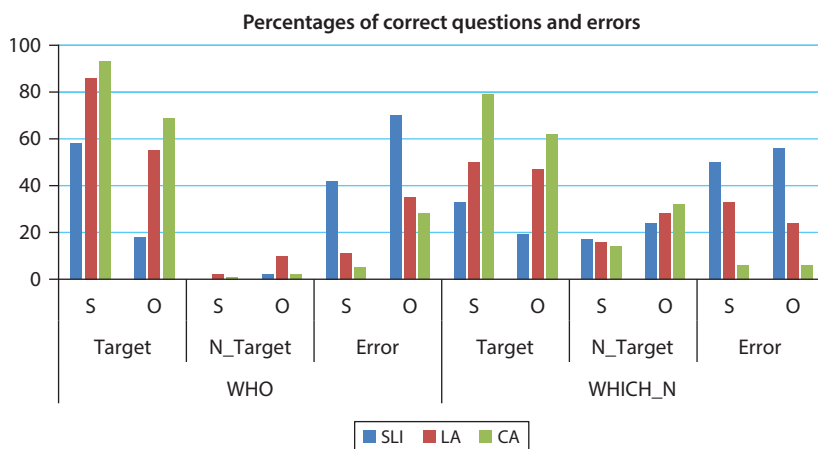


**Figure 6.3.** Percentage of *wh*-questions produced by children with SLI, Language age (LA) matched children and chronologically age (CA) matched children. Questions may have a Target structure (Wh V N) or a N_target correct structure (left dislocation of subjects, null subjects, passives). Errors are all conflated together. Questions are presented as a function of extraction site (subject and object) and type of *wh*-element (*who*- and *which*-questions). Elicited production data from Guasti, Branchini, Vernice, Carravieri & Arosio (submitted)

agreement matches that of 5-year-old children. Notice that children with SLI were weaker than LA matched controls in the production of questions, particularly object questions. Thus, difficulties with agreement cannot entirely account for difficulties in question formation. These data indicate that the course of language development in children with SLI is not uniformly delayed. When an object *who*-question was elicited, children with SLI made more changes of *chi* (who) into *cosa* (what) than children with LA, but not than children with CA. The source of this error may be the fact that object questions are often introduced by *cosa* (what) and are about the theme, which is often an inanimate entity. This finding is a hint that children with SLI rely on lexical features such as animacy as much as CA control children do. Their linguistic development, in this respect, is age appropriate or not delayed.

In summary, the study of *wh*-questions reveals that children with SLI are more than 2 years behind typically developing children. They display the same difficulties, however. Object questions and subject *which*-questions are challenging for them, as they are for control children, although to a greater extent. Children with SLI make the same errors as control children; in some respects, they are similar to LA matched children (agreement errors); in other respects, they are similar to CA matched children (changes into *what*), revealing an uneven profile.

*Wh*-questions are challenging also for children with Developmental Dyslexia (DD). Although, at the group level, these children did not differ from CA matched

control children, at the individual level they did. Guasti, Branchini, Vernice, Barbieri and Arosio (2014) reported that children with DD with mean age 9;4 (SD = 1.3) produced *wh*-questions, but had more trouble with object than with subject *wh*-questions, like CA matched children. Similarly to these, they changed the *which*-element more frequently when an object question was targeted than when a subject question was. They produced various types of object questions: questions with left dislocation of the subject, with a null subject and some passive questions. However, no group effect was found. Likely, this is due to the fact that not all children with DD had trouble with *wh*-questions. In fact, at the individual level, it was found that 9 out of the 18 children with DD scored below the means of the CA group on either *who-* (2 children) or *which*-questions (7 children). This confirms the fact that, among the children with DD, only a subset have problems with oral language. As we pointed out in other chapters, it is possible that these children are indeed affected by SLI, although no formal diagnosis was performed.

In conclusion, the production of object *wh*-questions is challenging for Italian-speaking children with TD, even at age 5, for children with SLI at age 7 and for some children with DD, at age 9.


## Summary and questions for future research

In this chapter, we have been dealing with the acquisition of *wh*-questions. Monolingual Italian-speaking children from about age 2;0 spontaneously produce a variety of *wh*-questions featuring movement of the *wh*-element to the left periphery of the clause. In these questions, the subject is either null or at the end of the clause, but never appears in between the *wh*-element and the verb. In other words, children's questions respect the requirement that the *wh*-element is moved to the left periphery and that it must be adjacent to the verb. In spite of the early use of *wh*-questions, a full mastery of these structures takes some time: in comprehension, object *wh*-questions featuring reversible verbs are hard to understand up to age 11;0, and by contrast, subject *wh*-questions are well understood from age 3–4 years.

In production, we observed the same subject/object asymmetry at age 5 and in adults. Production provides additional information with respect to comprehension, because it shows that participants produce a variety of structures when object questions are elicited, with differences between children and adults. In contrast, both children and adults produce only a single type of structure when subject questions are elicited (wh V N). Production provides us with the information that object questions with the structure wh V N are particularly taxing for children.

To deal with this range of facts, we discussed an account which is inspired by the same ideas exploited to explain the subject/object asymmetry in relative clauses.

The leading idea is that locality is central in the computation of linguistic structures and intervention by some qualified element in a given local relation affects or disrupts the computation. The specific execution of this idea is different (but compatible) from that adopted in the Chapter 5, because the elements involved are in different configurations. Specifically, object questions are difficult because the object copy intervenes in the AGREE relation between the functional head hosting agreement features and the post-verbal subject. AGREE interference may not be the only challenge in the formation of *wh*-questions.

Besides the difficulties observed with object questions (both *who* ad *which*), we also observed that subject *which*-questions were challenging for children. This suggests that the operation of pied-piping the nominal part, in combination with the various processes of agreement (between the *wh* and the nominal part and between the *wh*-phrase and the verb or between the verb and the subject), is challenging for (Italian) children.

Given these findings on typical development, it is not surprising that 7-year-old children with SLI are challenged in the production of object questions. Although they produce *wh*-questions, they are more than 2 years behind age expectations (LA matched control were 5 year olds). Some children with DD are also taxed in the production of questions, suggesting that these children may be affected by additional SLI.

These studies raise a number of questions. First, we have seen that children produce a variety of object *wh*-questions. Their comprehension has been tested with only one type of structure, the one with the post-verbal subject (wh V S). One natural area of investigation would focus on the comprehension of passive object questions, questions with null subjects or questions with subjects dislocated in the left periphery. Recall from Chapter 5, that passive object relatives (POR) are better comprehended than active object relatives by monolingual children from age 6 on.

A second area of inquiry concerns the development of the production of *wh*-questions. The data reported in this chapter concerns 5 year olds and adults, but one may want to know whether some of the structures produced by 5 year olds become obsolete at later ages, as adults do not produce object questions with left dislocation of the subject.

In this chapter, we have seen mainly subject and object questions. One study has looked at other types of questions introduced by other *wh*-elements (e.g. *where*, *why*). However, other types of *wh*-elements have not been tested, specifically those requiring pied-piping of prepositions like *a chi* (to whom), *con chi* (with whom), *in quale posto* (in which place), etc… If pied piping is challenging, one may observe difficulties with these wh-elements. Interestingly, some *wh*-elements do not display agreement, like *a chi*, while others do, like *in quale posto/in quali posti* (in which-pl place-pl). Thus, if pied piping is challenging when it is combined with agreement processes, then one may observe selective problems.

# The acquisition of the syntax and interpretation of subjects

## 7.1  Introduction

Italian is a null subject language, in which pronominal subjects are unpronounced unless some special discourse reason requires their overt realization. For instance, given the sentence in (1), the appropriate continuation could be a sentence like (2)a; (2)b is perceived as an inappropriate repetition (annotated as %), much like (2)c:

(1)  Gianni è uscito alle 5
   Gianni went out at 5

(2)  a.  Ha preso la metropolitana ed è arrivato a casa alle 6
      - took the metro and -arrived at home at 6

   b.  % Lui ha preso la metropolitana e (lui) è arrivato a casa alle 6
      He took the metro    and he arrived at home at 6

   c.  % Gianni ha preso la metropolitana e (Gianni) è arrivato a casa alle 6
      Gianni took the metro    and Gianni arrived at home at 6

To illustrate with another clear context, in the question answer pair in (3), an appropriate answer to the question in (3)a is (3)b, whereas (3)c is again felt as an inappropriate repetition:

(3)  a.  Che cosa ha fatto Gianni?
      What did Gianni/"What did Gianni do?"

   b.  È uscito alle 5
      - went out at 5

   c.  % Lui è uscito alle 5
      he went out at 5

In a different type of context, the overt realization of the pronominal subject may instead be felt as perfectly appropriate. For instance, in a context such as the one in (4)a, the overt realization of the subject pronoun in the continuation in (4)b allows for the required distinction between the two referents; similarly in (4)d as the continuation of (4)c, involving a first or second person pronoun; in (4)e use of the overt pronoun provides a corrective focalization with respect to the statement in (4)a:

(4)  a.  Gianni e Maria sono usciti alle 5
Gianni and Maria went out at 5

b.  Lui ha preso la metropolitana, lei è andata a piedi
he took the metro, she walked

c.  Io e Maria siamo uscite alle 5/Tu e Maria uscirete alle 5
I and Maria went out at 5 /You and Maria went out at 5

d.  Lei ha preso la metropolitana, io sono andata a piedi/Lei prenderà la metropolitana, tu andrai a piedi
She took the metro, I walked/She will take the metro, you will walk

e.  No, LUI è uscito, non lei/lei no (lei/Maria è rimasta a casa)
No, HE went out, not she/she didn't (she/Maria stayed home)

Hence, pronominal subjects, characteristically known and given from the context, are generally null in standard Italian, unless the need exists to express them for referent identification or types of focalization such as contrast/correction.

Overt lexical subjects fill a pre-verbal position in the structure of the clause and are associated with an interpretation that is characteristically associated to clausal subjects, sometimes called "aboutness" (Frascarelli's 2007; Rizzi 2005): The clausal predicate predicates some properties of the subject of the clause; in this sense, the clause is "about" the subject. A pre-verbal subject can be known from the context, and in this sense it has topic-like properties (5a), or else it can be introduced for the first time in an out of the blue context (5b, c) and thus it may typically be indefinite:

(5)  (Context: we all know Gianni; and we also have some expectation about him in the event described by the sentence)

a.  Gianni parlerà alle 5
Gianni will talk at 5

(Context: out of the blue)

b.  Un conferenziere parlerà alle 5
A speaker will talk at 5

c.  Uno stagista ha incontrato il direttore alle 5
An intern met the director at 5

In cartographic terms, pre-verbal subjects have been analysed as occupying different positions in the high part of the clause, according to their lexical or pronominal nature, across languages (Cardinaletti 2004; Rizzi & Shlonsky 2007). Null pronominal subjects, often labelled *pro*, fill the same position as the weak, topic-like overt subject pronouns of non-null subject languages such as e.g. English and French illustrated in sentences like (6), analogous to the Italian one in (3)b:

(6)  (Context: Q. What did John do?/Qu'est-ce-que Jean a fait?)
a.  He went out at 5
b.  Il est sorti à 5 heures

Null-subject languages typically avail themselves of the further important grammatical option of allowing a lexical subject to fill a post-verbal position. Indeed, since the first work on the null-subject parameter (Rizzi 1982; Jaeggli & Safir 1989), the grammatical possibility of admitting the subject in a post-verbal position has been identified as a direct consequence, in fact a correlated property, of the positive setting of the parameter itself. Italian sentences with a post-verbal subject are given in (7), illustrating some contexts favouring the post-verbal location of the subject:

(7)   a.   (Context: Q.  Chi ha parlato alla conferenza?)
                          Who has talked at the conference?
            –    Ha parlato Gianni
                 Has talked Gianni

      b.   (Context: Q.  Chi ha letto la sentenza?)
                          Who read the verdict?
            –    L'ha letta il giudice
                 It-cl read the judge

      c.   (Context: Q.  Chi è entrato nella stanza?)
                          Who entered the room?
            –    È entrato Gianni
                 (Is) entered Gianni

      d.   (Context: Q.  Che cosa è successo?)
                          What happened?
            –    È entrato un pompiere/?? il pompiere dalla finestra
                 (Is) entered a firemen /?? The fireman from the window

In (7)a–c the post-verbal subject constitutes the new information focus constituent, answering with the identification required by the question; in (7)d the subject is post-verbal in a so called all-new context. The sentences in (7)a–c contain verbs belonging to three different verb classes, intransitive (sometimes called unergatives), transitive, unaccusative (Burzio 1986). As the examples show, the new information subject is uniformly post-verbal with all verb classes. (7)d contains an unaccusative verb and an all-new/out of the blue type context. In this type of context the post-verbal subject is preferably indefinite with unaccusatives. This is the phenomenon that goes under the label Definiteness Effect (DE), illustrated by the two question marks on the sentence in (7)d in the version containing a definite post-verbal noun phrase. With unaccusative verbs, the internal argument of the verb corresponds to the argument, which may become the pre-verbal subject of the clause, or which can remain post-verbal, filling the internal argument position; in both cases in standard Italian the verb agrees with it. (8) illustrates the agreement, and (9) gives the (assumed) argument structure for unaccusatives, e.g. *entrare* of the examples in (7)d above and (8)a, b below.

(8)  a.  Due/Alcuni/Dei/I pompieri sono entrati dalla finestra
         Two/Some/some/The firemen (are) entered from the window
     b.  Sono entrati due/alcuni/dei/??i pompieri dalla finestra
         (Are) entered two/some/some/?? The firemen from the window

(9)

```
                    VP
             _____/ _____
            /               \
          /  \              PP
         /    \
        V    DP(IA)
```
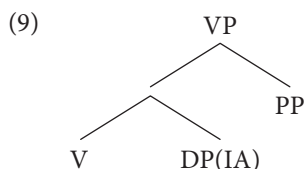
As (8)a indicates, there is no DE when the argument fills the pre-verbal subject position. DE has been assumed to be an effect that characteristically concerns the position of the internal argument of unaccusative verbs. Following the proposal in Belletti (1988), briefly put, there is no accusative Case available in sentences containing unaccusative verbs due to the somewhat reduced argument structure of this verb class illustrated by (9) that does not contain any functional "v" type head normally implicated in the assignment of accusative Case. The position of the internal argument has thus only access to a lexical/inherent type Case that can be directly assigned by the lexical verb.[1] This Case has the same properties overtly manifested by partitive Case in languages that morphologically realize it. In particular, only indefinite noun phrases can carry it and are compatible with the type of interpretation that this Case marker implies (Belletti & Bianchi 2014 for recent re-discussion of the proposal and of its semantic implications). If the noun phrase argument of an unaccusative verb is not filling the internal argument position, DE is not an issue anymore, and the noun phrase can be definite. This is what happens when it becomes a pre-verbal subject as in (8)a, which contrasts with (8)b in the definite version of the post-verbal subject.

This is in fact also the case when the subject fills the post-verbal position and is interpreted as the focus of new information. The examples in (7)a–c illustrate this fact, as in all of the examples, including the one with the unaccusative verb *entrare*, the subject is (hence, can be) a definite subject. It is then natural to assume that the noun phrase is not filling the internal argument position in examples like (7)c, in contrast with those in (8)b, and also in (7)d. Indeed, it can be assumed to fill a position external to the verb phrase in all of the examples in (7)a–c. Expressing this property in cartographic terms, the subject can be assumed to fill a position dedicated to the new

---

1.  Possibly, accusative is in fact never directly accessible to the position in which the internal argument is merged, also with transitive verbs, as in the following structure (10). The implications of the technical implementation of the way accusative is assigned and its possible interaction with DE are beyond the scope of the discussion in this chapter. As nothing hinges on these details, the slightly simplified assumptions in the text can be adopted.

information focus interpretation (Belletti 2001b, 2004a); this position should be low, in the immediate periphery of the verb phrase, and could be filled by the noun phrase subject of the clause with all verb classes. Such noun phrase is the external argument with transitive and intransitive verbs, whose schematic representation of the argument structure is given in (10) below, and it is the internal argument of unaccusatives, as illustrated by the unaccusative argument structure in (9). In (10) the verb phrase is bigger than the unaccusative verb phrase in (9), as it contains the external argument whose presence is mediated by the functional verbal head labelled "v" (Chomsky 1995; Larson 1988):[2]

(10)

```
              vP
          ___/  \___
       DP(EA)      \
              \___
               v
                \___
              ___/   \___
             V        DP(IA)
```
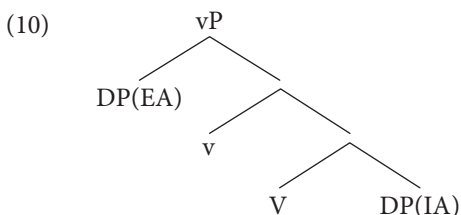
The low new information focus position is external to the verb phrase. To the extent that the constraint regarding definiteness concerns the VP-internal position of the low internal argument of the verb, it is expected that no such constraint should affect a new information focus subject that fills an external position in the periphery of the verb phrase. The relevant focus position and the overall structure of a sentence containing a new information focus subject is schematically illustrated in the (simplified) structure in (11) (see Belletti 2004a for detailed discussion); in (11) the pre-verbal subject position of the clause is filled with a silent (expletive like) pronoun, *pro*. Following the traditional approach to the null subject parameter as in the references quoted above, this analysis captures the fact that the possibility of so called subject-inversion structures displaying the order VS is tightly linked to the positive setting of the null subject parameter. According to the analysis in (11), the order VS is obtained by moving the external argument of transitive and intransitive verbs or the internal argument of unaccusatives into the specifier of the low focus position external to the verb phrase; the verb moves in turn into a higher inflectional position and this yields the linear order VS. Given the positive setting of the null subject parameter, this is the way in which the low focus position in the periphery of the verb phrase can be exploited in a

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**2.** The small "v" is the abstract head, which is overtly realized in the so called light-verb constructions that are found in various languages (Grimshaw 1988; Collins 1997). It is then natural to assume that what is overt in some language may be left covert in others, but still be present. This is a research strategy which has allowed for quite significant empirical discoveries, in particular in the P&P tradition, and we will follow it here in line with a long-lasting tradition.

null subject language like Italian. (11) illustrates the structure and the derivation with an intransitive verb (*parlare*/speak):

(11)
$[_{CP} \dots [_{TP} \textit{pro} \dots \text{ha} \dots [_V \textit{parlato}] \dots [_{\textbf{FocP}} [_{DP}\text{Gianni}] \dots \text{Foc} \dots [_{vP} \langle \text{Gianni} \rangle \dots \langle V \rangle \dots ]]]]]$

Let us now make explicit a property that has been left implicit so far, but which can be directly deduced from the presentation above. As discussed, in sentences containing unaccusative verbs, the order VS can result from two very different computations: the argument can either remain in the position where it is first merged as the internal argument of the verb, or it can be moved into the specifier of the low new information focus position. The difference depends on its discourse value illustrated in paradigms (7) and (8). In the former case the VS order reflects the linearization of the result of the first merge operation (verb-internal argument, in head initial Italian); in the latter case, the order results from the internal argument moving into the specifier of the new information focus position peripheral to the verb phrase, and the verb moving higher into a relevant inflectional position, as illustrated in (11). In the former case, some DE is manifested; in the latter case no such effect is manifested as (7)c has illustrated. Hence, as for the nature and interpretation of the post-verbal subject in the latter case, sentences with unaccusatives behave just like sentences with verbs belonging to any other verb class, transitive or intransitive ((7)a, b). In conclusion, with unaccusative verbs there are in principle two ways to obtain the linear order VS: (i) as a reflex of first merge, with the noun phrase in the internal argument position, as in (9); (ii) as a consequence of focalization in the low periphery of the verb phrase, as in (11). With transitive and intransitive verbs the order VS only derives from a computation as in (11), i.e. it is an instance of (new information) focalization.[3]

In the case of all new/out of the blue sentences, virtually corresponding to the answer to a question like *what happened?* (as in e.g. 7d), when the verb is transitive and intransitive, the subject can be pre-verbal as illustrated by examples presented in (5b, c) above. In this type of context, the subject can also be post-verbal both with intransitive (12a) and with transitive verbs (12b), in the latter case the object is a clitic (Calabrese 1992; Rizzi 1996 for discussion):

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3. The new information focus interpretation of post-verbal subjects in the vP external periphery is the most typical interpretation. See Belletti (2004a) for a discussion of the possible topic (-like) interpretation of some post-verbal subjects in the vP-periphery, which count as right dislocated and are associated with a special prosody. See also Cardinaletti (2001) for the discussion of other types of structures referred to as "marginalization" (Antinucci & Cinque (1977). Here we consider what we take to be the core of the phenomenon concerning post-verbal subjects, i.e. the new information focus interpretation in contexts like those in (7)a–c.

(12)   (Cosa è successo?)
      What (is) happened?

   a.   Ha parlato Gianni/un ragazzo
        Has spoken Gianni/a boy

   b.   (Il libro) L'ha presentato Gianni/uno scrittore
        (The book) it-cl has presented Gianni/a writer

This order can be assumed to be obtained through movement of the entire verb phrase into the (Spec of) the new information low focus position; the linear order VS is again obtained through further movement of the verb into a higher inflectional position. (13) illustrates the derivation for sentence (12)a, as the answer to the question *what happened?* Notice that the derivation in (13) shares the fundamental insight of (11) and is in this respect a very similar derivation. The only difference between the two cases is that in (11) a new information post-verbal subject is derived, whereas (13) illustrates an all new verb phrase, with the subject also being post-verbal:

(13)
$[_{CP} \ldots [ _{TP} \; pro \ldots ha \ldots [_{V} \; parlato] \ldots [_{\textbf{FocP}} \, [_{vP} Gianni \, \langle V \rangle \, ] \; Foc \ldots [_{v \, P} \; Gianni \; v \; [VP\ldots]]]]]$

As a final descriptive remark, we point out that in the VS order, with S = subject of new information in contexts as in (7)a–c, the post-verbal subject can also be realized as an overt pronoun. Consider (14) in this respect:

(14)   a.   (Context: Q. Chi ha parlato alla conferenza?)
            Who spoke at the conference?

       b.   A:   Ha parlato lui
                 Has spoken he

The well-formedness of (14) is consistent with the interpretation of the post-verbal subject in this context as a subject of new information. A focalized subject must be overt, hence if it is pronominal it must be an overt pronoun.

   The acquisition of the overall distribution of subjects, as can be deduced from the synthetic presentation above, involves several dimensions. It includes both the setting of the fundamental null subject parametric property of Italian and also the related interpretive properties which concern: the discourse-appropriate use of null vs overt pronominal subjects; the ability to properly locate the lexical subject in pre-verbal or post-verbal position according to discourse related factors concerning the information content to be expressed. Hence, we may say that there is one crucial formal grammatical property to be determined by any child acquiring Italian: the null subject property expressed by the null subject parameter; the positive setting of the parameter then requires the ability to properly use null and overt pronominal subjects and to locate overt subjects in the pre-verbal or in the post-verbal position in a way which is appropriate to the pragmatics of discourse exchanges. Furthermore, the distribution

of post-verbal subjects has been described above to interact in complex ways with the verb class to which the verb belongs. This is a further property that has to be mastered for the proper computation and interpretation of Italian subjects.

The present chapter reports on the current state of the art on these aspects in the acquisition of the syntax and interpretation of Italian subjects. The developmental question will consider different populations, with special attention to typical development and adult L2 and bilingual acquisition for which the literature is rather rich. In the case of adult L2 and bilingual acquisition the interesting situation may arise in which the setting of the parameter is different in the two languages involved. Some reference will also be made to atypical development in the domain of subjects.

The chapter is organized as follows: Section 2 presents the acquisition of null and overt subjects in typically developing children, including the acquisition of the conditions regulating the pre- or post-verbal location of the subject according to discourse and lexical factors and to definiteness (2.1). Section 3 addresses the acquisition of the syntax and interpretation of Italian subjects in different populations with considerations regarding the SLI population (3.1); special attention will be dedicated to (adult) L2 and to attrited Italian in this domain (3.2) as well as to the acquisition of overt and null subjects in bilinguals (3.3). The last section summarizes and concludes the chapter.

## 7.2 Null and overt subjects in typically developing children

Typically developing children acquiring Italian have been generally reported to display a behavior compatible with the positive setting of the null subject parameter from very early on, namely from their first productions. For instance, typically developing children acquiring Italian have been described as not undergoing a Root infinitive stage in contrast with children acquiring non-null subject languages (e.g. French, Pierce 1992; English, Hyams 1986; Rizzi 1993/4; Wexler 1994, see Chapter 1); they were also reported as being able to master verbal agreement morphology from their first productions (Guasti 1993/94, and Chapter 1). These two properties of very young Italian-speaking children together are also an implicit indication that they are able to properly use the null subjects from early on, as their first morphologically correct productions also involve null subjects. Specifically, Lorusso (2003) and Lorusso, Caprin and Guasti (2005) counted the ratio overt-null subjects in the spontaneous productions of Italian-speaking children from the Childes database, aged between 18 and 36 months, Diana, Martina, Raffaello, Rosa and compared it to the same ratio in the speech of the adults interacting with them. The finding is a remarkable parallel ratio in the two groups, which is matched by the results of every single child, as reported in Table 7.1 from Lorusso et al. (2005).

**Table 7.1.** Percentages of overt-null subjects in children (aged between 18 and 36 months) and in adults interacting with them (from Lorusso, Caprin, Guasti 2005)

|  | Overt subjects | Null subjects |
|---|---|---|
| Diana | 27% | 73% |
| Martina | 33% | 67% |
| Raffaello | 21% | 79% |
| Rosa | 23% | 77% |
| Total Children | 25% | 75% |
| Total Adults | 26% | 74% |

Lorusso et al. (2005) also studied the distribution of overt subjects according to the different verb classes present in the children's spontaneous productions (see also Lorusso 2014 for further consideration of the issue), both in the corpora from CHILDES and in newly collected corpora from a cross-sectional study. Interestingly, the two data sets showed a remarkable similarity. There were 59 children from the cross-sectional study aged from 22 to 35 months, they were videotaped and audiotaped in a natural conversational setting while playing with their caregivers. Overall, both studies have shown two basic patterns: (i) there were more overt subjects with unaccusatives than with transitive and intransitives, hence subjects were null in a smaller proportion with unaccusative verbs than with transitives and intransitive verbs (Table 7.2); (ii) overt subjects occurred more frequently in the post-verbal position with unaccusatives than with transitives and intransitives (Table 7.3).

**Table 7.2.** Percentages of overt subjects according to verb classes in children and in adults interacting with them. Longitudinal data from Childes and from cross-sectional data from Lorusso et al. (2005)

|  | Unaccusatives | Transitives | Intransitives |
|---|---|---|---|
| Children from CHILDES | 36% | 22% | 25% |
| Adults | 41% | 20% | 40% |
| Children from cross-sectional corpus | 29% | 11%–15%* | 12% |

*Divided according to presence/absence of complement; see Lorusso et al. for details

Since the highest percentage of overt subjects in children's productions occurs with unaccusative verbs, as shown by Table 7.2, this indicates that null subjects are less frequent with unaccusatives than with the other verb classes. This fact together with the highest percentage of overt subjects in the post-verbal position, shown by Table 7.3, indicates that young children treat the subject of unaccusative verbs differently from

**Table 7.3.** Percentages of Pre- and Post-verbal subjects according to verb classes in children and in adults interacting with them. Longitudinal data from Childes and from cross-sectional data from Lorusso et al. (2005)

|  | Unaccusatives | | Transitives | | Intransitives | |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Pre** | **Post** | **Pre** | **Post** | **Pre** | **Post** |
| Children from CHILDES | 34% | **66%** | 72% | 28% | 79% | 21% |
| Adults | 43% | 57% | 63% | 37% | 83% | 17%% |
| Children from cross-sectional corpus | 46% | 54% | 74% | 26% | 74% | 26% |

the subject of the other two classes. In particular, young children from early ages may be taken to be sensitive to the fact that the post-verbal subject of an unaccusative verb is in fact an internal argument. As discussed in Section 1, the order VS with unaccusatives may directly reflect the merge position of the nominal argument as the internal argument of the verb. It is known that children may omit subjects also in non-null subject languages in the so called early child-null subject stage (Hyams 1986; Rizzi 1993/4; Valian 1991); however, omission of internal arguments is much rarer in the same stage. Hence, the fact that null subjects are less frequent with unaccusatives in the children's earliest productions strongly supports the conclusion that they are treating the subject as the internal argument of the verb. Null subjects are licensed only in the (dedicated, Cardinaletti 2004) pre-verbal subject position; hence, a post-verbal subject of an unaccusative verb in its merge position cannot be a null subject.[4]

Italian speaking young children master null subjects from early on also as far as their appropriate use in concrete discourse exchanges is concerned. This is the conclusion that is drawn by Serratrice (2005) on the basis of her longitudinal study of the Calambrone corpus from the CHILDES database (containing the children studied in Lorusso et al. 2005 and two more children: Guglielmo and Viola). Further specific evidence comes from the production experiment discussed in Chapter 4, dedicated to the acquisition of passive. Manetti (2012) tested 12 children aged 3,5–4;6 on the type of answer given to Patient oriented and Agent oriented questions (the former type of question tested possible passive answers as discussed in Chapter 3). In the present discussion, the relevant questions to consider are the Agent oriented ones, which naturally elicit (S)VO answers and in which the (pre-verbal) subject is most naturally null. E.g.: Q: *Che cosa fa la mucca*/What does the cow do? A: (*La mucca*) *Lecca il*

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4. Notice incidentally, that a post-verbal subject can never be null with the other verb classes either, since, as discussed in Section 1, the post-verbal subject of a transitive or intransitive verb is typically a new information focus subject (as in (11), or is part of a focalized vP as in (13)), hence it is necessarily overt. See below for further discussion on new information post-verbal subjects.

*bambino*/(the cow) licks the kid. Overall, children answered with an appropriate null subject in 69% of sentences (65/94) and with an overt (lexical) one in 31% (29/94), similar to the adults' performances (80% vs 20%).[5]

### 7.2.1 More on post-verbal subjects in typically developing children according to verb classes and definiteness

In the light of the complex interaction of the different factors governing the distribution and interpretation of post-verbal subjects in Italian presented in the introductory Section 1, the results from Lorusso et al. (2005) presented in the previous section leave an important question open: if post-verbal subjects are more numerous with unaccusative verbs due to the possibility only available with this verb class to process the post-verbal subject as the internal argument of the verb merged in the direct object internal argument position as illustrated in structure (9), can we be reasonably sure that young children are aware of the interpretive limitations constraining the distribution of the internal argument/post-verbal subject of unaccusative verbs? Recall that this internal argument must be indefinite as it is constrained by the DE; the effect is in turn attributed to the Case property of this verb class and to the fact that only partitive Case is available to this position, a Case which only indefinites can carry, along the lines of Belletti (1988). If it can be proved that young children are aware of the indefiniteness requirement on the post-verbal subject of unaccusatives, then the fact that their post-verbal subjects are more numerous with unaccusatives is indeed a strong indication that they are able to treat this subject as an internal argument, according to the unaccusative hypothesis (Burzio 1986; Perlmutter 1989). Recall that the post-verbal subject of unaccusatives can also be a new-information focus subject, as it is the case with transitive and intransitive verb classes. Hence, as discussed in Section 1, there are two possible types of post-verbal subjects with unaccusatives: the post-verbal subject internal argument, and the post-verbal new information focus subject, derived as in 11 (or 13). Hence, unaccusatives are expected to occur with post-verbal subjects more than transitives and intransitives, as it was indeed the case for both adults and children in Lorusso et al.'s data (Table 7.3). But in order to make this conclusion strong for children, the question indicated above needs to be raised; simply put: are children aware of the possible double source of the post-verbal subject with unaccusatives? A crucial step in answering this question is whether it can be shown that they are aware of the

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**5.** The ability to master the null-overt distinction in the discourse pragmatics of the question-answer exchange is also indirectly shown by the fact that in the Patient oriented questions subjects had been overtly expressed by children appropriately in 74% of the answers; there was also a neutral condition (cosa è successo?/what happened) and also in this case subjects were appropriately overt in the majority of cases, 86%.

DE; this would in turn be an indication that they are aware of the different verb classes and treat them differently according to the structural distribution of their arguments, in particular of the subject: Only with unaccusatives the subject is merged as the internal argument (structure 9), whereas it is the external argument with transitives and intransitives (structure 10).

The question has been raised in all its complexity by Vernice and Guasti (2014), who checked and manipulated its three fundamental ingredients: definiteness of the subject, verb class, word order SV/VS. Vernice and Guasti (2014) tested a group of 25 monolingual Italian-speaking children in the age range 4;2–5;11 in a repetition task. The rationale behind the use of a repetition task comes from the idea that repetition is not simple retelling but rather active reconstruction of a sentence, along the lines of Friedmann (2007) (see also Lust 2005). Hence, incorrect repetition of an impossible sentence provides a kind of grammaticality judgment in disguise, in that it suggests that the ungrammaticality has been somehow detected.[6] The way a sentence is repeated is in turn an indication of the knowledge that children have of a given structure, since they should be able to repeat/produce only structures that involve computations that they can master. Thus, the incorrect repetition of an impossible sentence may in fact count as a correction of the sentence, which is in turn revealing of the children's internal grammar. Vernice and Guasti (2014) provide an articulated quantitative and qualitative analysis of their results, of which we report here the main features, directly relevant to the question under discussion.

The authors tested children's ability to repeat sentences like those in (15), where the marginality of (15)b illustrates the DE under the argument structure in (9) since the internal argument of an unaccusative verb can only be indefinite. The presence of the PP is a crucial indication that the noun phrase is kept in the internal argument position, along the lines of structure (9) and as in Example (7)d of Section 1:

(15)   a.   Esce un orsetto con i suoi amici
            Goes out a little bear with its friends

       b.   *Esce l'orsetto con i suoi amici
            Goes out the little bear with its friends

The sentences were presented with neutral intonation[7] in an all-new type context referring to a picture presented to the children. The sentences were introduced by

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**6.** The identical repetition of an ungrammatical sentence is expected to be harder.

**7.** I.e. with application of the Nuclear Stress Rule implying alignment to the right in Italian, Cinque (1993), Frascarelli (1997).

a preamble like: *C'è un bel sole nel bosco, Poi…*/It's a sunny day, then… In this situation, sentence (15)a is well-formed, whereas (15)b is not, as an instance of DE. Children were less prone to correctly (i.e. literally) repeat sentences like (15)b than they were to correctly (i.e. literally) repeat sentences like (15)a: the ratio is 31% literal repetitions in the case of (15b) and 52% literal repetitions in the case of (15a), as illustrated in Table 7.4 below. The statistical analysis shows that this difference is highly significant, which is in turn a strong indication that at age 4 children have a clear sense of the DE with unaccusative verbs, hence of the fact that the post-verbal subject of unaccusatives can be processed as an internal argument. Recall that the pragmatics of the sentence to be repeated involved an all new/out of the blue context; hence, in this type of context the post-verbal subject is not in the vP external peripheral focus position through a derivation like (11). Hence, in this type of context the order V S PP is only obtained with S in its internal argument position. This in turn implies that the noun phrase (S) must be indefinite, hence the DE and the unacceptability of (15)b. Interestingly, children repeated sentences like (15)b by changing the word order, thus producing sentences with the SV order in 57% of the cases (the remaining 12% were other type of answers, Table 7.4), i.e. they produced sentences like (16), which are perfectly grammatical, since definiteness does not condition the pre-verbal subject position:

(16)　(Poi…) L'orsetto esce con i suoi amici
　　　 (Then) The little bear goes out with its friends

Children also transformed VS into SV with intransitive verbs, as in paradigms like (17) also taken from the stimuli used in the study. Thus, sentence (17)a/b were transformed into (17)c:

(17)　a.　(Poi…) Passeggia un orsetto con i suoi amici
　　　　　 (Then…) Walks a little bear with its friends

　　　 b.　(Poi) Passeggia l'orsetto con i suoi amici
　　　　　 (Then…) Walks the little bear with its friends

　　　 c.　(Poi…) Un orsetto/L'orsetto passeggia con i suoi amici
　　　　　 (Then…) a little bear/the little bear walks with its friends

(17)c corresponds to the type of repetition produced by children in 63% of the cases for sentences like (17)a and 67% of the cases for sentences like (17)b. Essentially, children transformed VS into SV with intransitives at a very similar rate in both cases, with no significant difference depending on the definite or indefinite nature of the subject noun phrase. This suggests that children know that the post-verbal subject is never an internal argument with intransitives. Hence, definiteness is not an issue in (17) and the sentences are repeated/changed with SV order independently of this variable. The

relevant argument structure should be along the lines in (10), modulo presence of the PP argument, as illustrated in (18):

(18)

```
              vP
            /    \
      DP(EA)      \
              /    \
             v      \
                   /   \
                  V     PP
```
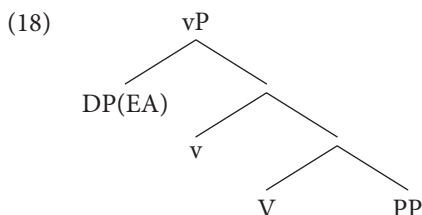
Given the argument structure in (18), in order to get the order verb-subject-PP with intransitives, the subject should be a focalized subject, filling a vP-peripheral position as in the derivation in (11).[8] However, this analysis and the related interpretation was not compatible with the discourse conditions set by the experiment in which the sentence was an all-new sentence, of the type presented in (5) in the introductory Section 1. Children's answers show that they did not entertain this analysis.

As discussed in connection with the sentences in (12) of the introductory Section 1, an all-new context of a similar type as the one set by the experiment could also be compatible with a derivation along the lines in (13), in which the whole verb phrase is the focus of new information and the verb is further moved to a higher inflectional position; given the argument structure in (18), this derivation could yield the order V S PP, once verb movement has occurred. However, as noted, children appear to have disfavored this type of derivation, as they have correctly (i.e. literally) repeated the sentence with the V S PP order only in a minority of cases with intransitive verbs, irrespective of the definite (23%) or indefinite (25%) nature of S (Table 7.4). This was in sharp contrast with their behavior with unaccusatives for which the correct (i.e. literal) repetition of the V S PP order reached 52% when S was indefinite.

As mentioned, children often "corrected" the sentences of the type in (17a, b) with intransitives by producing in their repetitions sentences as in (17)c with the SV order, up to 67% of the cases. Since they did so independently of whether the subject was definite or indefinite, this indicates that they were dealing with this noun phrase as the external argument of the intransitive verb for which there is no definiteness requirement as it is merged in a high position of the intransitive vP. It should be noted that children preferred the SV repetition in general, indicating a general preference for this word order in the all-new context set by the experiment. However, the preference was much stronger with intransitives than it was with unaccusatives, and especially

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8.    We assume that the subject does not remain in the vP/spec position. We have expressed this in cartographic terms in the introductory section deriving the new information focus interpretation of the post-verbal subject in the terms described there.

so in the indefinite condition. Indeed, with unaccusatives the correct repetition with the VS order reached a level (52%) when the post-verbal subject was indefinite, which was very close to the repetition/correction into SV order (57%) when the subject was definite. Hence, the order VS, which mirrors the order in which the noun phrase S is merged within the VP with unaccusatives, is much more readily available in an all new context with this verb class than it is with intransitive verbs, provided that S corresponds to an indefinite noun phrase.[9] Table 7.4 summarizes the articulated shape of the repetition results.

**Table 7.4.** Percentages of repetition according to verb class and definiteness of the Subject (adapted from Vernice & Guasti 2014)

| Sentence to be repeated | SV repetition | VS repetition | Other |
|---|---|---|---|
| VS indef | | | |
| Intransitive | 63% | 25% | 13% |
| Unaccusative | 39% | **52%** | 9% |
| VS def | | | |
| Intransitive | 67% | 23% | 9% |
| Unaccusative | **57%** | 31% | 12% |

Vernice and Guasti (2014) is the first study, which has manipulated the definiteness of the post-verbal subject in order to analyze children's awareness of the different positions in which the subject is first merged in the argument structure of the different verb classes of unaccusatives and intransitives. The results have shown that children at age 4 are aware of this difference. Indeed, children's behavior in repetition resembled the grammaticality scale produced by a group of adults also tested in the experiment, which provided a kind of baseline of the acceptability status of the sentences utilized. We can align with the authors' conclusion that children at age 4 have shown to be able to distinguish the syntax and interpretation of the post-verbal subject of unaccusative verbs in a way which is consistent with the unaccusative hypothesis and with the different argument structure (9) of unaccusative verbs, on one side, and intransitive (and transitive) verbs, on the other (10, 18).

The conclusion that there are more VS sentences with unaccusatives in children's early spontaneous productions because these sentences may reflect the linearization of

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**9.**   VSPP, with V = unaccusative in the all-new context could also involve a derivation like (13) with the whole VP focalized in the periphery of the verb phrase. This derivation does not affect the word order which, with unaccusatives, has the subject in the post-verbal position anyway as it is merged as the internal argument.

the first merge order, as was proposed in connection with Lorusso et al.'s (2005) data, is thus supported by the new experimental results presented in Vernice and Guasti (2014). Furthermore, the overall results of the latter study have also shown that there was a preference in children's repetition for the VS order with unaccusatives, with S indefinite, and for the SV order with intransitives, with S either definite or indefinite; these overall results strongly indicate that children treat the subject of sentences containing verbs belonging to the two verb classes differently and, at age 4, they know the grammatical/interpretive and the discourse factors constraining its distribution.[10]

Recent converging evidence for the early mastery of different verb classes and specifically of the special status of the indefinite post-verbal subject/internal argument of unaccusatives comes from Lorusso's (2014) recent recounting of the productions of the children from the CHILDES corpora (studied in Lorusso 2003; and Lorusso et al. 2005). Lorusso's recent recounting was performed according to the definiteness of the overt subject produced by the (young) children with different verb classes. A very sharp distinction emerged for the first time: whereas children produced few indefinite subjects overall across the three verb classes, the majority of indefinite subjects were produced with unaccusatives and they were located post-verbally in the overwhelming majority of cases (total of 26 indefinite subjects with unaccusatives, of which 3 pre-verbal and 23 post-verbal). Furthermore, whereas the quantity of pre-verbal indefinite subjects is very limited and equivalent across verb classes (2 with intransitives, 3 with transitives and 3 with unaccusatives), post-verbal indefinite subjects are relatively numerous with unaccusatives, but are simply absent with the other verb classes (23 with unaccusatives, and 0 with both intransitives and transitives). Results are summarized in Table 7.5.

**Table 7.5.** Raw figures and percentages of indefinite and definite subjects across verb classes (adapted from Lorusso 2014)

|  | Pre-verbal indefinite | Pre-verbal definite | Post-verbal indefinite | Post-verbal definite |
|---|---|---|---|---|
| Unaccusatives | 3 (4%) | 70 (96%) | **23** (18%) | 130 (82%) |
| Intransitives | 2 (4%) | 55 (96%) | 0 (0%) | 14 (100%) |
| Transitives | 3 (1%) | 290 (99%) | 0 (0%) | 117 (100%) |

10.    As the authors discuss in detail, these results argue strongly against the proposal in Babyonyshev (2001) (and also Borer & Wexler 1987) according to which young children would first analyze unaccusatives as intransitives; their conclusion is in line with Friedmann (2007), and Friedmann and Costa (2011), and also with Snyder, Hyams and Crisma (1995) and more recently Snyder and Hyams (2014), although none of these studies had also manipulated the definiteness feature of the subject.

These results are further clear evidence that children know different verb classes from early on, that they master the syntax of subjects accordingly and, crucially, that they also master the DE, which singles out the post-verbal subject/internal argument of unaccusatives from very early on. These are interesting new results as they also indicate that even very young children know enough about an intuitively, pre-theoretically complex property such as definiteness.

## 7.3    Subjects in different populations

### 7.3.1    Considerations on null subjects in SLI

There is not much dedicated research on the mastery of the syntax and interpretation of subjects by SLI Italian speakers. This poverty may reflect the intuition that this area of syntax does not represent a special difficulty in this population. No specific research has been conducted on the distributional and interpretive subtleties involving overt pre- and post-verbal subjects. Hopefully, new evidence will be produced in the future. As research now stands, however, some evidence is available on the mastery of null subjects by SLI Italian speaking children. Arosio et al. (2010, 2014) quoted in Chapter 3 have provided indirect evidence concerning the ability to use null subjects by SLI Italian speaking children in a discourse appropriate way. The conclusion has been reached in the context of the study concerning their mastery of object clitics. The quoted study showed the difficulty of the SLI population investigated in supplying object clitics. As observed by the authors, however, children did not show any general difficulty in the mastery of discourse pragmatics; in particular, the group of SLI children investigated (age range 6;4–8;7) showed absolutely no difficulty in the mastery of null subjects. Recall that in the experimental design, children had to supply a clitic in the familiar question-answer pair, e.g. *Che cosa fa la rana alla farfalla?*/what is the frog doing to the butterfly?; expected answer: *La mangia/*It easts it(cl). Whereas object clitics were hardly supplied in the answers, as discussed in Chapter 3, the SLI children had no difficulty in producing the discourse appropriate null subject that the question also elicited in the answer. Null subjects have been supplied at ceiling in 90% of the cases, as they were expected.

### 7.3.2    Post-verbal and null subjects in (adult) L2

#### 7.3.2.1    *Post-verbal new information subjects*
The L2 acquisition of the discourse appropriate use of new information focus post-verbal subjects was directly addressed by Belletti and Leonini (2004). This study investigated the ability to provide a post-verbal subject in the answer concerning its

identification as in the pairs in 7a-c, of Section 1. The study used verbs of different classes, as in (19):[11]

(19)  a.  *Chi ha urlato?*                    (intransitive)
          who has screamed

      b.  *Chi è arrivato?*                   (unaccusative)
          who is arrived

      c.  *Chi ha aperto la finestra?*       (transitive)
          who has opened the window

26 L2 speakers aged between 19 and 35 were tested. They were all visiting students in Italy, whose time of residence in Italy ranged from 1 month to 5/6 years. Their level of Italian was generally not advanced (although some were more advanced than others). The most numerous group was constituted by L1-German speakers (16); there was also a small group of (3) L1-French speakers. We report results from this two groups.[12] Each L2 speaker was presented with 22 short video clips through a Power Point presentation, in which everyday actions/events were displayed. At the end of each video a number of questions were asked, among which a question of the type in (19). A group of 10 adult L1-Italian speakers served as controls. The same video elicitation task was then run with another group of 17 L1-English speakers by Belletti, Bennati and Sorace (2007); the level of the L2 speakers was *near native* this time (under White & Genesee 1996 procedure). A further group of 8 adult L1-Italian speakers served as controls in this second study. In both studies, Italian-speaking controls answered with the order VS (98% and 93%), as indicated in (20):[13]

(20)  a.  *Ha urlato la ragazza*
          has screamed the girl

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11.  Also questions containing existential constructions were present as in: *Cosa c'è sopra il tavolo?/* what is there on the table? These were the only ones systematically leading to VS type answers in the L2 productions, e.g. *Ci sono le chiavi,* /there are the keys, indicating that the existential structure has its own peculiarity, shared across languages. We leave these structures out of our presentation.

12.  The rest was so constituted: 2 L1-Polish, 1 L-Russian, 1-L1Bosnian, 1 L1-Albanian, 1 L-Dutch, 1 L1 Greek.

13.  Since the order VS with transitive verbs requires use of the clitic, the L2 speakers had been tested on their capacity to produce object clitics. The results are reported in Chapter 3. Cliticization may add to the complexity of these structures with transitive verbs, which are the least produced by the L2 speakers of both experiments. From Belletti & Leonini (2004): L1-German: 14% vs 23% with unaccusatives, 16% with intransitive; L1 French: 2% vs 42% with unaccusative, 13% with intransitives. From Belletti, Bennati & Sorace (2007): L1 English: 20% with transitives, 32% with unaccusatives, 34% with intransitives.

     b.   *E' arrivato Francesco*
           is arrived Francesco

     c.   *L'ha aperta Silvia*
           it-CL has opened Silvia

Belletti (2013) discusses the relevance of these experimental results in enriching both the database on which formal linguistic theory can rely, and their descriptive relevance for language comparison and the characterization of (adult) L2 language development. We mainly concentrate here on the latter aspect. Table 7.6, adapted from the synthesis reported in Belletti (2013), summarizes the main results of both studies:

**Table 7.6.** * Percentages of answers to subject questions by adult L2 speakers of Italian as a function of structures used (VS = post-verbal subject; SV = pre-verbal subject, Cleft = subject cleft sentence) (from Belletti 2013)

| L1 | VS | SV | Cleft |
|---|---|---|---|
| German | 27% | 68% | 0 |
| French | 21% | 9% | 69% |
| Italian controls1 | 98% | 1% | 0 |
| English near native | 29% | 71% | 0 |
| Italian controls2 | 93% | 7% | 0 |

*Results of L1-German, French and Italian controls1 from Belletti & Leonini (2004). Results of L1-English near-natives and Italian controls 2 from Belletti, Bennati & Sorace (2007)

     Results in Table 7.5 indicate that the L2 speakers, independently of their level of Italian – both the non-advanced group and the *near native* group – tended to preserve the type of *answering strategy* of their L1 also in their L2 answers. Thus, both the L1-German speakers and the L1-English speakers answered more frequently with the order SV (and associated prosody as in their L1) than with the order VS; the L1 French speakers provided a high number of subject-cleft answers (e.g. *È una donna* (*che ha portato i fiori*)/it is a woman who has brought the flowers). SV and subject-clefts are the characteristic answering strategies of the L1s of the L2 speakers (Belletti 2007, 2009, 2013 for detailed discussion). The tendency to preserve in the L2 the L1 answering strategy was also observed in the adaptation to Finnish of the same video elicitation experiment run by Dal Pozzo (2011): 25 non-advanced L1-Finnish speakers of L2 Italian answered with their L1 SV order in 80% of the cases.[14] Taken together these

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**14.**   The percentage decreased a bit with the increase of the VS order in advanced L1-Finnish speakers all living in Italy suggesting that some development can occur. Individual variation may also play a role. We leave open at this level of elaboration this potentially subtle and very articulated issue.

results indicate that: i. the adult L2 speakers of Italian whose L1 was a non-null subject language in all cases had reset the value of the null subject parameter since they all did produce a significant proportion of VS structures, an option tightly connected to the positive value of the parameter; ii. despite this, all groups of L2 speakers, also at the near native level, continued to prefer, at a remarkably steady proportion, the answering strategy of their L1 also in the L2 Italian. This finding contributes to a characterization of adult L2 development: although the relevant grammatical property (i.e. null subject parameter) is properly mastered, yet in the discourse conditions identified by the elicitation experiment, the answering strategy of the L1 remains active and promptly accessible in the L2. This is clearly connected to the fact that the L1-type answer is not in conflict with any grammatical property of the L2. The SV order is clearly possible in Italian; it is a fact that it is overwhelmingly not adopted in L1 standard Italian where the VS answering strategy systematically prevails.

An interesting question that is opened by these results and by the interpretation just given is whether, in the opposite situation, e.g. L1-Italian, L2-English, the prevalence of the L1 strategy continues to be observed. If the interpretation given is on the right track, we should expect that this should not be the case since in English an Italian type VS sentences like those in (21) mimicking (20) are ruled plainly ungrammatical – contrary to SV in Italian – due to the non-null subject nature of English:

(21)  a.   [*]Screamed the girl
      b.   [*]Has arrived Francesco
      c.   [*]Opened it Silvia

The question was raised by adapting to English the video elicitation task; the results are presented in Belletti (2013). As expected, virtually no VS was produced by the 19 adult L1-Italian speakers of L2 English who answered with the appropriate English SV order in 72% of the cases (1% of verb-subject order only; the rest were 27% of other type answers);[15] 91% of SV answers have been produced by the L1 English speakers, comparably to the systematic VS answers of the L1 Italian controls of the previous experiments summarized in Table 7.5.

In conclusion, we can conclude that the appropriate answering strategy for the realization of a new information focus subject is relatively hard to acquire and the L1 preferred strategy remains active in the L2 grammars also at very advance levels of attainment. Interestingly, however, this is typically the case only when the non native-like answer is compatible with the L2 grammar, as it is the case for L2 Italian of L1

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**15.**  The experiment has been run and the data have been collected by Giulia Bellucci in 2010. Whereas word order was appropriate, the prosody of the SV L2 answers, which should require a particular stress on the pre-verbal subject, was not native like. On the general difficulty in acquiring L2 prosodic properties, see Zubizarreta & Nava (2011).

speakers of non-null subject languages investigated. The same does not happen in the opposite direction, which suggests that once the null subject parameter is reset on the L2 value, the extension of the L1 answering strategy to the L2 does not occur, as it would lead to the production of ungrammatical L2 sentences. This is what elicited production data have indicated so far.[16]

**7.3.2.1.1**  *Post-verbal subjects with unaccusatives.*    Some spontaneous productions of the same group of *near native* speakers were tested in Belletti Bennati Sorace (2007). In the relevant experimental task the L2 *near natives* had to describe a silent movie (*Storytelling*). Their descriptions were compared with those of the Italian controls. The aim was to provide a comparison of the two groups as to their productions of post-verbal and null subjects. The latter results will be discussed in the following subsection. Here we report the results on post-verbal subjects: they were remarkably similar for both *near natives* and controls, 16% and 15% respectively. Taken at face value, this result may appear in contradiction with the results on new information post-verbal subjects reported in the previous section. These results indicated that productions of post-verbal subjects were low in the *near native* group, and much lower than in the control group. The incoherence is, however, only apparent if the nature of the verbs and the type of subjects used in the *Storytelling* are considered. Since the verbs described the situation depicted in the silent movie they were the same in both groups and they were, for both groups, all unaccusatives; in most of the cases the post-verbal subject was indefinite.[17] Thus, we are in the situation in which the post-verbal subject is in the internal argument position, as in structure (9). It is then not surprising that the L2 speakers did not have any special difficulty in dealing with this type of post-verbal subject, whose possibility is due both to the lexical class to which the verbs belong and as for its indefinite nature to the fact that it is the internal argument of the unaccusative verb. This cluster of properties is different and independent from the properties relevant for the licensing of new information post-verbal subjects discussed in the previous section. Indeed, post-verbal indefinite subjects with unaccusative verbs are possible in English as well in *there* sentences of the type: *there came a man*. Hence, the universal status of the lexical semantics of the unaccusative class on the one side, combined with the possibility of similar structures in the L1 must be at the source of

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**16.**    Possibly, mistakes yielding the ungrammatical VS order may be found in spontaneous production data of L2 English, possibly at the early stages of attainment. This is an open question for which further study is required.

**17.**    The residue were definite noun phrases with a special interpretation, labeled *uniqueness* (i.e. having a unique single referent, as in e.g. *il portafoglio*/the wallet). This interpretation was assumed to be compatible with partitive Case in Belletti (1988).

the parallel behavior of the *near native* group and the control group in this experiment. Some of the sentences produced by the *near native* group are given in (22):

(22)  a.  Manca un cesto
          is missing a basket (A basket is missing)

      b.  Arriva un ragazzino
          arrives a boy (A boy arrives)

      c.  Passa un uomo
          goes by a man (A man goes by)

      d.  Cade una pera
          falls down a pear (A pear falls down)

Following traditional analyses of the null subject parameter, the pre-verbal subject position of these sentences is filled by a silent expletive *pro*, the equivalent of the overt English expletive *there* (Rizzi 1982; Cardinaletti 1997, 2004). In this respect, these sentences are a further indication that the null subject parameter has been adequately reset by these speakers, coherently with the same conclusion reached in the previous subsection. We now move to a description of the L2 mastery of referential null subjects.

**7.3.2.2**  *Null and overt pronominal subjects in (adult) L2 with reference to attrition*
The same group of 17 *near native* L2 speakers of Italian (with English as their L1) has been tested on the Picture Verification task (PVT) design developed in Tsimpli et al. (2004). We report here on the clearest results of this experiment (all relevant further details in Belletti, Bennati & Sorace 2007). The L2 speakers were tested on their comprehension of sentences containing a pronominal or a null subject in a subordinate clause as to the possible antecedent that could be picked up for it either in the matrix clause, subject or object or, alternatively, in the external context of the event described by the sentence. The L2 speakers saw a sentence and had to choose between three pictures the one that corresponded to the intended meaning of the sentence. The choice indicated the intended referent selected by the speakers. The two type of sentences whose results we report here are given in (23):

(23)  a.  L'anziana signora saluta la ragazza, quando lei attraversa la strada
          the old lady says hello to the girl, when she crosses the road

      b.  La mamma dà un bacio alla figlia, mentre *pro* si mette il cappotto
          the mother kisses the daughter, while (she) *pro* puts on the coat

Whereas Italian speaking controls had a clear preference for the selection of the direct object of the matrix clause as the antecedent of the overt pronoun in sentences like (23) a (C: 85%), almost never selected the subject (S: 5%), and only marginally selected the external referent (E:10%), L2 *near natives* reacted very differently: they also preferred the direct object (C: 65%), however they selected the matrix subject to a significantly

higher proportion (S: 30%); selection of the external referent was comparably marginal (E: 5%).[18] In contrast, the reaction to sentences of the type in (23b) with a null subject in the subordinate clause was quite parallel in the two groups. S: 54%, C: 45% E: 1%, for the L2 *near natives*; S: 40%, C: 54%, E: 6% for the controls. These results are summarized in Table 7.7:

**Table 7.7.** Percentages of choice of S = Subject; C = Complement; E = External referent as antecedent for overt and null subject pronoun in the subordinate clause by adult near native speakers of L2 Italian (L1 = English) and control subjects (adapted from Belletti, Bennati & Sorace 2007)

|  | S | C | E |
|---|---|---|---|
| L2 near natives *overt* | 30% | 65% | 5% |
| Controls        *overt* | 5% | 85% | 10% |
| L2 near natives *pro* | 54% | 45% | 1% |
| Controls        *pro* | 40% | 54% | 6% |

Table 7.7 indicates that the L2 *near native* speakers master the interpretation of null subjects at a native level. However, they do not have a native-like behavior as far as the interpretation of the overt pronominal subject is concerned: although there is a clear preference to pick the matrix object as the preferred antecedent as also controls do, they also pick the matrix subject as a possible antecedent for the overt subject pronoun at a significantly higher rate than controls (30% vs 5% is a highly significant difference). This behavior is most likely an indication of an analysis of the overt subject pronoun *lei* as a weak pronoun (Cardinaletti & Starke 1999). Since overt subject pronouns are in fact strong tonic pronouns in standard Italian,[19] it seems reasonable

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**18.**    On the preference for the non-subject antecedent of an overt subject pronoun in a null subject language like Italian, see Carminati (2002), Frascarelli (2007).

**19.**    According to Cardinaletti (2004a) third person subject pronouns *lei* and *lui* may be undergoing a change from strong stressed pronouns to possibly weak. This may be an interfering factor accounting for the behavior of the near natives. However, the fact that Italian speaking controls do not have the same reaction strongly suggests that the weak pronoun analysis is favored as a type of transfer from their L1.

Sorace and Filiaci (2006), in line with Sorace (2004) speculate that the preference for the "overt" pronoun that these results seem to indicate may reflect a sort of unmarked choice due to processing load considerations characteristic of the L2 situation, irrespective of the parametric properties of the L1 (see also Clahsen & Felser 2006). Notice, however, that the attrition facts to be reported in the test suggest a wider effect and a plausible role played by the "other" non null subject language and the nature of its pronominal subjects.

to conclude that this misanalysis is influenced by the weak nature of the overt subject pronouns of their L1-English. Thus, the interpretation of overt subject pronouns seems to represent a residual area of influence from the L1 also at the near native level.

The shape of these results is robust. A different group of 14 adult L2 *near native* speakers of Italian with English as their L1 were also tested with the same PVT by Sorace and Filiaci (2006) (L2 speakers living in Italy; see also Filiaci 2003, with L2 speakers living in the UK); their performance was compared against that of a different control group of L1 Italian speakers (living in Italy). The results are remarkably parallel those in Table 7.7, as summarized in Table 7.8:

**Table 7.8.** Percentages of choice of S = Subject; C = Complement; E = External referent as antecedent for overt and null subject pronoun in the subordinate clause by adult near native speakers of L2 Italian (L1 = English) and control subjects (adapted from Sorace & Filiaci 2006)

|  | S | C | E |
|---|---|---|---|
| L2 near natives *overt* | 27% | 60% | 13% |
| Controls *overt* | 8% | 82% | 11% |
| L2 near natives *pro* | 46% | 43% | 11% |
| Controls *pro* | 51% | 44% | 8% |

Interestingly, similar results had been obtained by Tsimpli et. (2004), which tested L2 speakers of English on their L1 Italian in situations of attrition with the same PVT. The authors tested 20 very advanced/near native speakers of L2 English with Italian as their L1, who had been living in the UK for at least six years and whose Italian might in principle have been subject to attrition. Indeed, the clearest attrited area in the domain investigated by the PVT task on the interpretation of null and overt subject pronouns concerned precisely the interpretation of overt pronominal subjects. In sentences of the type in (23a), both the L1-Italian attrited speakers and the Italian speakers acting as controls preferred the matrix complement as the antecedent of the overt subject pronoun (between 70 and 80% for the two groups); however, a significant difference emerged between the groups in that the L1-Italian attrited speakers selected the matrix subject as a possible antecedent for the overt subject pronoun to a much higher rate than the controls: 21.5% vs 7.6% respectively. Again, this may be interpreted as the sign of a misanalysis of the overt subject pronoun as a weak pronoun also in Italian, as it is the case in English, the L2 of the very advanced/near native speakers whose first language was undergoing attrition.

A similar conclusion can also be drawn on the basis of the results of the *Storytelling* task. We have seen in 3.2.1.2 that L2 *near natives* and controls had a completely parallel behavior as to the amount of post-verbal subjects produced in their spontaneous descriptions, all involving unaccusative verbs. Results on the descriptions provided by

the L2 *near natives* and the Italian speaking controls, however, were very different as far as the distribution of overt and null subject pronouns is concerned: although L2 *near natives* and Italian speaking controls supplied a comparable amount of null subjects (52% and 59% respectively), yet the amount of overt subject pronouns used by the L2 *near natives* in their spontaneous descriptions was significantly higher than that used by the Italian speaking controls: 14% vs 4% respectively. Interestingly, this is the only choice in which the two groups had a distinct behavior, as they had also been very close in the distribution of overt lexical subjects. Table 7.9, summarizes these results:

**Table 7.9.** Percentages of overt and null subjects in spontaneous descriptions by adult L2 near native speakers of Italian and their controls
(adapted from Belletti, Bennati & Sorace 2007)

|                    | Null | Overt pronominal | Overt lexical noun phrase |
|--------------------|------|------------------|---------------------------|
| L2 *near natives*  | 52%  | 14%              | 18%                       |
| Controls           | 59%  | 4%               | 22%                       |

Again, we can speculate that the possible analysis of overt subject pronouns as weak pronouns may be favored in the L2 *near natives* due to L1 influence and it is thus at the source of this residual different behavior of the two groups.

### 7.3.3   Overt and null subjects in bilinguals

As was clearly revealed by the interpretive judgments of the Italian-speaking controls in the experiments on the interpretation of pronouns reviewed in 3.2.2, an overt subject pronoun tends to pick up as its antecedent the complement of the matrix clause or, to some extent an external referent, but only very marginally the matrix subject (Tables 7.7 and 8). Results are less neat for a null pronominal subject, which is both compatible with a subject or a complement antecedent (Table 7.7), as well as, to the same extent as in the previous case, with an external referent. In the L2 population and in situations of attrition, the interpretation of the overt subject pronoun was shown to work differently, with the possibility of a significant higher acceptance of the matrix subject interpretation compared to L1-Italian-speaking controls. Hence, in the L2 situation overt pronouns have a wider range of possible interpretations. The question whether something similar also happens in the bilingual situation has been addressed in a number of studies, which investigated whether any overuse of overt subject pronouns can be detected in simultaneous bilinguals being exposed to two languages from birth.

Overall, studies, which have collected and analyzed production data repeatedly detected an overuse of overt subject pronouns in simultaneous bilinguals. In these studies dealing with Italian as one of the two languages, the other language was always

a non-null subject (Germanic) language; in addition, the data collected were from young bilingual children, overall from 1;07 up to 4;6 (Serratrice et al. 2004/English-Italian, one child: 1;10–4;6; Müller et al. 2006a/German-Italian, five children: 1;7–3;1, 1;8–3;1, 2;0–3;5, 1;9–3;5, 1;6–3;0; Pinto, 2006/Dutch-Italian, two children: 1;9–4;1, 2;9–3;9). Serratrice (2007) extended this line of research to English-Italian bilingual children (age 6;11–8;4) by means of a PVT of the type discussed in the previous Section 3.2.2 (in connection with adult L2). The test contained sentences like (24):

(24) a. La mamma dà un bacio alla figlia, mentre si mette il cappotto
the mother kisses the daughter, while (she) puts her coat on

b. Il portiere saluta il postino, mentre lui apre la porta
the porter greets the postman, while he opens the door

Also in this setting, bilingual children preferred the matrix subject as the antecedent for the overt pronominal subject of the subordinate clause to a significantly higher proportion than Italian speaking adults and children controls.[20]

Sorace et al. (2009) also addressed the issue experimentally with simultaneous bilingual children whose "other" language next to Italian was either English or Spanish. The rationale behind the choice of having an older population was that this allowed one to put to test a relatively complex task while being reasonably sure that the relevant syntactic knowledge was well in place in the two languages; the reason to have the same material tested in both English-Italian and Spanish-Italian bilinguals was that this allowed a direct comparison on a combination of languages, which were either different (English/Italian) or the same (Spanish/Italian) as for the setting of the null subject parameter. This could in principle highlight possible crosslinguistic influences between the two grammatical systems. We now report the main results of this study on the Italian sentences on which the bilingual children have been tested.

Overall 90 bilinguals were tested: 20 English-Italian bilinguals living in the UK, 39 English-Italian bilinguals living in Italy, 31 Spanish-Italian bilinguals living in Spain. Each group was divided in two subgroups of younger (Mean age: 6;9, 6;8, 6;7) and older (Mean age: 8;8, 8;8, 9;0) children. Two subgroups of Italian speaking monolinguals (Mean ages: 6;8, 8;9) and two subgroups of English speaking monolinguals (Mean ages: 6;7, 8;9) and one Italian monolingual group of adults and one English monolingual group of adults acted as controls. In total, 167 children were tested in this study. The English-Italian bilinguals were also tested on English sentences parallel to those utilized

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20.  The preference also obtained in the so called cataphoric condition in Serratrice's terms, i.e. in cases in which the subordinate clause containing the overt subject pronoun precedes the matrix clause. This condition was also tested with L2 adults in the PVT experiment presented in Section 3.2.2. However, as mentioned in text, we decided to only illustrate the clearest results, which typically concern sentences like those in (23)/(24), the anaphoric condition in Serratrice's (2007) terms. The reader is referred to the quoted works for all detailed results.

for the Italian material. In this test, they behaved at ceiling in a way wholly comparable to that of the monolingual controls. Since the English material contained both grammatical (e.g. *Donald said that she sneezed*) and ungrammatical (e.g. *Donald said that sneezed*) sentences, the English task was essentially a grammaticality judgment task, for which both bilinguals and monolingual controls behaved alike. The Italian material instead did not contain ungrammatical sentences, but the selection had to be made on the basis of preference in the interpretation. The Italian material was constituted of sentences like those in (25) which referred to a scene that each child watched on a video clip; four characters were present in each scene (Mickey and Donald; Minnie and Daisy), two in foreground and two in the background. One of the characters in the foreground said something, then each of the two characters in the background referred what the previous character had just said by beginning the sentence with e.g. "Minnie ha detto che (Minnie said that)…". One sentence had a null subject the other an overt pronominal subject in the embedded complement of the verb "ha detto". Children were told that the characters were learning Italian and that they should decide which one had spoken better Italian. The two relevant conditions are defined by the authors as [−Topic shift/TS] and [+ Topic shift/TS] respectively since in the former case the null/overt pronominal subject of the embedded clause is meant to refer to the subject of the matrix clause (i.e. a topic type argument), in the latter the null/overt pronominal subject of the embedded clause is meant to refer to a different argument, i.e. the other character in the foreground; hence, the [+TS] cases mimic the situation of sentences like those in (23a) of the PVT of the previous sections. Recall that in those sentences the object was the preferred antecedent of the overt pronominal subject for native controls. In the [+TS] of this study the referent for the overt pronominal subject may be taken from the contextual situation. Examples of the stimuli used are illustrated in (25)a, b:

(25)   a.   [−TS]
    (Minnie and Daisy in the foreground; Mickey and Donald in the background)
       Minnie:   sono caduta!
                I have fallen
       Donald:   Minnie ha detto che *pro* è caduta
                Minnie has said that (she) has fallen
       Mickey:   Minnie ha detto che lei è caduta
                Minnie has said that she has fallen

    b.   [+TS]
    (Minnie and Daisy in the foreground; Mickey and Donald in the background)
       Minnie:   Daisy è caduta!
                Daisy has fallen
       Donald:   Minnie ha detto che *pro* è caduta
                Minnie has said that (she) has fallen
       Mickey:   Minnie ha detto che lei è caduta
                Minnie has said that she has fallen

The clearest result of this study is that the bilingual children preferred the overt pronoun option also in [−TS] contexts in which the null option is the preferred one by controls to a significantly higher rate. The effect was stronger in the English-Italian bilinguals than in Spanish-Italian bilinguals; the latter group, however, did so to a rate comparable to that of the younger group of monolingual controls.[21] Figure 7.1, reproduced from Sorace et al. 2009, illustrates these results. A further aspect of the result was that in the [+TS] condition, the Italian controls preferred, as expected, the overt subject pronoun option, but they did so significantly more than both groups of bilinguals.

The first result is in line with the results of previous studies mentioned; the novelty of the present study is that the preference is confirmed also in Spanish-Italian bilinguals thus indicating that the choice of the overt option cannot simply be a matter of cross-linguistic influence, since Spanish, much like Italian, is a null subject language. The authors suggest that the overt option might be the unmarked initial choice, possibly preferred by immature processing systems, as also suggested by the fact that younger Italian speaking controls also adopted it in [−TS] condition, as indicated in Figure 7.1. The effect is stronger in English-Italian bilinguals resident in the UK, and this is plausibly interpreted as an effect of the bilingual input, which instantiates many overt subject pronouns in English, hence ultimately as a real cross-linguistic influence.

It may be noted however that also the adult controls did sometimes select the overt pronoun option, as Figure 7.1 indicates. Thus, the choice of the null subject option in these cases is in fact a matter of preference, a strong preference in adults' Italian (and also in older control children); but the overt option is not a source of ungrammaticality. We can speculate that this contributes to account for the bilingual children's behavior and for the fact that also Spanish- Italian bilinguals explore the overt subject option, the interesting new result of this study. The results illustrated in Figure 7.1 suggest that the exploration lasts longer in the bilingual groups than it does in the monolingual (children) controls. We may conjecture that the bilingual setting favors the exploration of different (UG) options, which is something that all children do, but may last a bit longer for bilinguals.[22] But what would the explored relevant option be? Again, the answer could be the analysis of the overt subject pronoun as a weak, instead of just a strong pronoun, as it typically is in standard Italian. This analysis may also

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21.  Overuse of overt (3rd person) subject pronouns has also been informally observed (no formally documented counting available, unfortunately) in some corpora of spontaneous production of young monolingual Italian speaking children. Thanks to Nina Hyams for pointing out this potentially very interesting observation, which deserves further work in the future.

22.  See Sorace et al. 2009 for a partly different hypothesis in terms of bigger processing demands for the null option.

be favored by an ongoing possible reanalysis of the third person singular pronouns *lui* and *lei* (those contained in the experimental stimuli) from solely strong to also possibly weak (see Cardinaletti 2004a for a development of this idea, and Footnote 19). If a weak form is the most appropriate one in the so called [-TS] contexts, then not only *pro* but also an overt weak pronoun can be selected as the subject of the subordinate clause, co-referent with the matrix subject. Note that, if this speculation is on the right track, the ambiguous status of the overt third person singular pronouns *lui* and *lei* as either strong or weak may also explain the adult controls' choice referred to above; furthermore, it may be an interfering factor in conditioning the behavior of adult L2 speakers discussed in the previous section, probably favored, in that case, by the convergence with the weak status of subject pronouns in the L1, as discussed, hence as a case of cross-linguistic influence.
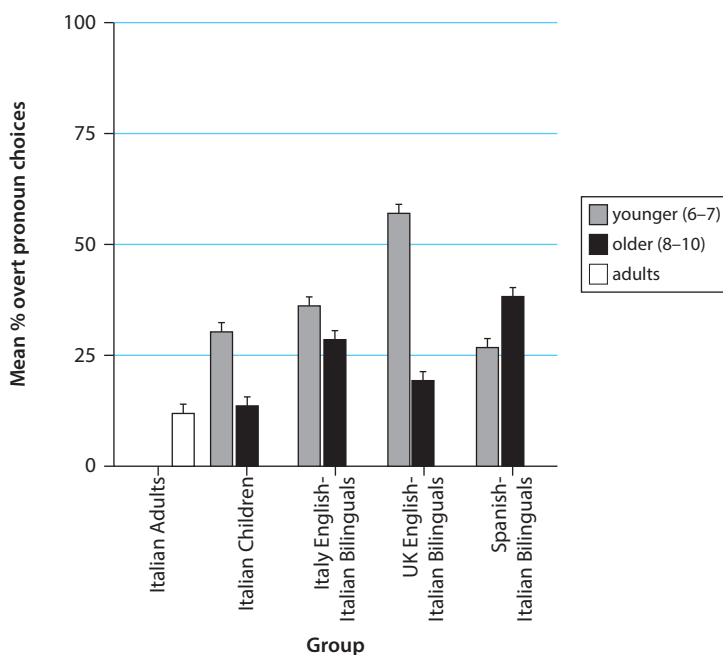


**Figure 7.1.** Percentages of overt subject pronouns choice in [−TS] contexts by various groups of bilingual children and one group of Italian-speaking adults (from Sorace et al. 2009)

In a similar vein, the initially surprising wider use of null subjects in the [+TS] context manifested in the bilinguals' preferences referred to above and illustrated in the following Figure 7.2 from Sorace et al.'s (2009) study could be interpreted along the following lines, close to the authors' proposal: use of the null subject option in the [+TS] context does not yield to ungrammaticality. It rather leads to a somewhat

more ambiguous sentence, since the overt (strong) option would be preferable in the standard language. However, since the video clip context may also help in identifying the relevant referent that is present in the video, this may lead some of the bilingual speakers to select the null option. Yet, preference for the strong option is not as clear as for all controls; this may also interact with the previous observation that the overt subject option is not so clearly analyzed as strong by these speakers.
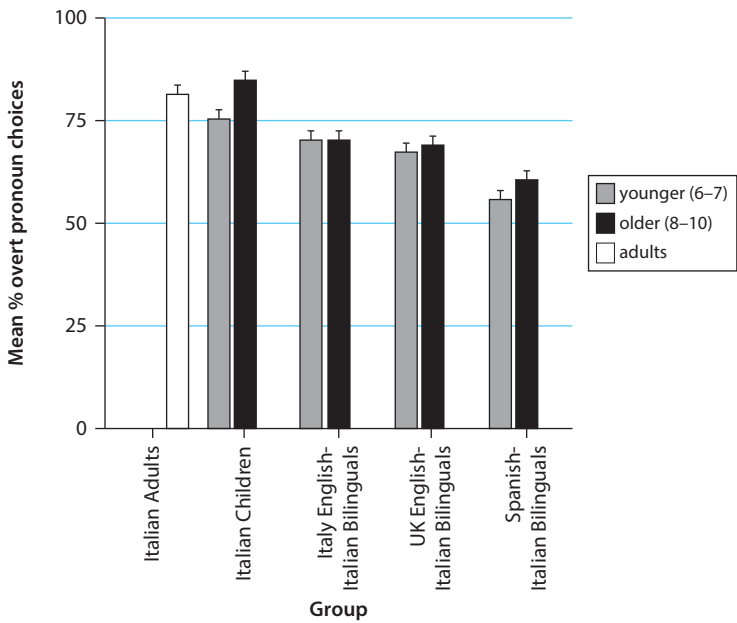


**Figure 7.2.** Percentages of overt subject pronouns choice in [+TS] contexts by various groups of bilingual children and one group of Italian-speaking adults (from Sorace et al. 2009)

Several interesting issues are raised by these results, which concern both the proper analysis of subject pronouns in different languages and a fine-grained characterization of the bilingual acquisition mode in an often intricate and non trivial way.

## Summary and questions for future research

The acquisition of the different properties of Italian subjects has been the topic of the present chapter. Robust results from spontaneous production have indicated a very early access to appropriate use of null subjects by Italian speaking young children. Good mastery of null subjects by Italian speaking young children converges with their early access to the proper mastery of verbal agreement inflectional morphology thus

indicating that the null subjects that Italian speaking children use from early on are of the type found in a null subject language and do not correspond to the so called child null subjects documented in children's early productions of non-null subject languages. Whereas children also properly use overt lexical subjects from their earliest productions, they do not use overt subject pronouns inappropriately; hence the different nature of overt and null pronouns appears to be in place from the beginning. Although the literature is relatively poor as for the acquisition of null and overt subjects in atypical development, from what is known in the research on SLI it can be concluded that null subjects are properly accessed and used in a felicitous way by SLI children in the age range examined, 6;4–8;7.

We have illustrated in the introduction and reconsidered throughout this chapter the intricacies of the syntactic distribution and interpretation of overt subjects in standard Italian. More specifically, overt subjects can be located in positions that either precede or follow the lexical verb. The post-verbal location of the lexical subject is not a unitary phenomenon though, as it is conditioned both by considerations related to the pragmatics of discourse exchanges, in particular to the focalized status of the post-verbal subject or of the whole verb phrase, and by factors depending on the lexical class to which the verb belongs. Typically developing Italian speaking children at age 4 have been shown to be aware of both types of properties from early on as they treat the post-verbal subjects of unaccusative verbs differently from those of intransitives, and they are also aware of the indefinite restriction holding on them, known as the Definiteness Effect/DE.

The lexical factor governing the distribution and indefinite nature of post-verbal subjects with unaccusative verbs appears to be relatively easily acquired also by adult L2 speakers of Italian, as can be deduced from the spontaneous description they provided in storytelling. In contrast, the strongly preferred post-verbal location of a new information focus subject characteristic of Italian appears to resist proper acquisition in adult L2, as is shown by robust results from work on answering strategies, where a peculiar instance of transfer and cross-linguistic influence clearly emerges. Finally, the L2 population, and to some extent also bilingual children, have been shown to overuse overt subject pronouns to an extent that is not found in the same proportion in the monolingual population, converging with similar results from attrited Italian.

New questions are raised by the results on the acquisition of the syntax and interpretation of Italian subjects reviewed here. One main question concerns the acquisition of this domain in the atypical populations on which very little is specifically known so far. It would be interesting to extend the elicitation designs from which robust results are now available to different types of atypical speakers; this would allows us to check on a peculiar type of discourse ability concerning the appropriate use and interpretation of pre-verbal and post-verbal focalized subjects, as well as null vs overt subject pronouns for which only indirect evidence is so far available. Similarly, the

proper acquisition of new information post-verbal subjects in both monolingual and bilingual children deserves special attention, in particular in the domain of answering strategies for which only preliminary evidence starts being gathered from on-going research. The question is particularly relevant from the theoretical point of view in the bilingual population when different strategies are preferably adopted in the different language combinations; a number of sub-questions naturally arise: is there a prevailing strategy? Are the different strategies equally early accessible in bilinguals? Is there cross-linguistic influence in simultaneous bilinguals as it appears to be the case in adult L2 speakers? These are among the questions naturally inspired by the research so far that may contribute to enhance our knowledge of both different acquisition modes and also the nature and precise theoretical characterization of the different strategies.

A domain of further investigation concerns the Definiteness Effect constraining the nature of the internal argument of unaccusatives; more data are welcome which should further reveal the different status of the post-verbal subject of unaccusatives depending on definiteness and its information value. Overall, the results already available that we have presented here indicate a sensitivity of young children to different verb classes as well as to the different information value of the VS order with unaccusatives with respect to intransitives. These data suggest an early mastery of both lexical properties and discourse properties in young children around age 4 and, partly, even earlier; more data from even younger children should continue to be gathered as this is a privileged complex domain simultaneously hinging on both lexical and discourse pragmatics competence for which developmental data may help in disentangling the various, often subtle, distinctions involved.

# The acquisition of aspects of Italian compositional semantics and of semantic-pragmatic interface

## 8.1 Introduction

This chapter is dedicated to the acquisition of some aspects of compositional semantics and of some aspects at the interface between semantics and pragmatics. In particular, we discuss the acquisition of scope interactions, of principle C in the contexts of quantified expressions and of reconstruction; we also consider the acquisition of scalar implicatures associated with the use of certain scalar expressions, such as connectives (*or*, *and*) and quantifiers, and the acquisition of the meaning associated to gradable adjectives, such as *tall*, *small*, *clean*, *dirty*.

The interpretation of scopally ambiguous sentences like (1a) is one of the central aspects of natural language semantics. The meaning of (1a) can be paraphrased as in (1b) or (1c) depending on the relative scope of the universal quantifier (*every*) and negation:

(1)  a.  Every horse didn't jump over the fence
     b.  Every horse is such that it didn't jump over the fence.
         (surface scope: every > NOT = none)
     c.  It is not true that every horse is such that it jumped over the fence.
         (inverse scope: NOT > every = not all)

The first interpretation, with wider scope of the universal quantifier, reflects the surface scope. On this reading, the sentence is true only in one situation; when no horse jumped over the fence. The second interpretation results from the assignment of inverse scope and means 'at least some horses (and possibly all) did not jump'. This meaning can be true in various situations; when some horses have jumped and some other did not jump. It is also compatible with a situation in which no horse has jumped. In fact, if "no horse jumped" is true, then *a fortiori* "not every horse jumped" is also true. Thus, (1c) is compatible with and weaker than (1b). This is because (1b) is true in a subset of the situations in which (1c) is true. Because of that, (1c) is less informative than (1b). In other words, if (1b) is true, (1c) is also true, namely, (1b) entails (1c) (see also below). One of the results from the acquisition of the relative scope of

negation and quantifiers is that children display a preference for the surface scope and have a hard time retrieving inverse scope. Italian is interesting in this domain. Since it is a language with a less rigid word order, it offers new opportunities to investigate the scope properties of negation and quantifiers. By examining the comprehension of sentences containing negation and post-verbal quantified subjects, we will see that inverse scope and surface scope are both accessible to children. This result allows us to establish that children compute scope relations based on a hierarchical abstract structure and not on linear order. The new contribution from Italian is that sensitivity to scope interactions is evident with minimally different sentences, which vary in the location of the subject, pre-verbal or post-verbal, both available in the same language. Sensitivity to inverse scope has been observed in previous work by Lidz and Musolino (2002) based on Kannada, which displays a different order of negation and quantifiers than English. Notice, incidentally, that sensitivity to scope interactions proves that children can move quantifiers, precisely to obtain the relevant readings. This conclusion is further reinforced by a study, discussed in Section 4, on children's sensitivity to principle C in sentences involving reconstruction (see Chapter 3, Section 5 for a discussion of children's interpretation of pronouns in contexts regulated by principles A and B of the binding theory). Results from this study have shown that around age 5, Italian-speaking children do not allow a bound reading of a pronoun c-commanding the R-expression, in compliance with principle C, which requires an R-expression to be free. At the same time, they allow the same reading when c-command of the R-expression does not hold.

A common view holds that sentence interpretation arises from the interaction of two major components: semantics and pragmatics. Sentences are assigned truth-values, which provide a characterization of their propositional content. Then, the use of the propositional content (i.e. truth conditions) in concrete communication is governed by pragmatic norms. In uttering a sentence, not only do we care about truth conditional content, but we also aim at being cooperative, saying the truth and saying something relevant in the given circumstances (Grice 1989). To understand how semantics and pragmatics divide their battlefield, a line of lively research has concentrated on the way adults and children interpret logical words, e.g. connectives and quantifiers. Consider sentence (2). On the most natural interpretation, this sentence invites the inference in (3).

(2)     Some Dutch linguists from Utrecht University spent their vacation
         in Italy in 2009.

(3)     Not all Dutch linguists from Utrecht University spent their vacation
         in Italy in 2009.

Adults do not seem to have trouble in deriving this inference, as demonstrated by their rejection of (2), if all Dutch linguists from Utrecht University came to Italy for their

vacation in 2009. In this same circumstance, 5-year-old children would accept a sentence like (2). Although research on this topic was very lively in the 1970s within the Piagetian framework, as part of an understanding of how logical reasoning develops, it was neglected in the linguistic investigation. Linguistic interest on this matter was revived in Italy in the late nineties within a linguistic framework (see Chierchia, Crain, Guasti & Thornton 1999; Chierchia 2004) and independently in France within a reasoning framework (Noveck 2001). Before examining the results in detail, let us briefly state the problem and introduce the relevant terminology.

Consider again the sentence in (2) and the inference in (3). Such inference is called scalar implicature (SI) and it is not part of the propositional content of the speaker's utterance in (2), but it is an inference that the hearer generates from the speaker's use of *some* in her utterance. In the neo-Gricean framework, the choice of certain terms rather than others affects our interlocutor's interpretation. In natural conversation, we aim at being informative as required by the situation, in conformity with the Maxim of Quantity, and we attempt to abide by the Principle of Cooperation and the other conversational maxims that rule our discourses (Grice 1989). Some elements, like *some* in our example, or *or*, belong to scales ordered according to informational strength, i.e. ⟨some, many, most, all⟩, ⟨or, and⟩, where *some* and *or* are the less informative elements of the respective scales. Informational strength refers to the quantity of information conveyed by a sentence; a sentence is more informative than another one, if it is true in a subset of the situations in which the other is true. For example, (4) is true in a subset of the situations in which (5) is.

(4)　Gianni o Maria verranno alla festa.
　　Gianni or Maria will come to the party

(5)　Gianni e Maria verranno alla festa.
　　Gianni and Maria will come to the party

Given the three situations in (6), (4) is logically true in all of them, while (5) is true only in S1. That is, (5) is true in a subset of the situations in which (4) is true and thus (5) is more informative and stronger than (4).

(6)　S1: Gianni and Maria both come
　　S2: only Gianni comes
　　S3: only Maria comes

The same reasoning holds for the scale ⟨some, many, most, all⟩. When the speaker chooses the weaker (less informative) term in the scale, she wants to convey the information that she doesn't have sufficient evidence to use the stronger (most informative) element, or that she knows that the stronger term does not apply. Thus, by hearing *Some Xs P*, the hearer will infer that the stronger term does not hold, i.e. that *NOT all Xs P*. Knowledge of the semantics and the pragmatics associated to scalar

items has been explored in various studies on Italian (and other languages), with both adults and children, with typical and atypical populations. In the following sections, we will review these data and then, based on the experimental findings, we will offer our view on the displayed behaviour, which is largely based on Foppolo, Guasti and Chierchia (2012).

Adjective interpretation is another area, where interpretation arises from the interplay of semantics and pragmatics, specifically that part of pragmatics that has to do with the retrieval of contextual information. From the semantic point of view, we can at least distinguish gradable adjectives (GA) such as *big*, *tall* and *small*, and non-gradable or nominal adjectives such as *Italian* and *vegetarian* (Partee 1995). Nominal adjectives are similar to common nouns (*apple*, *cat*) in that they denote a set of individuals sharing a property (i.e. the adjective *vegetarian* denotes the set of individuals that are vegetarian, just as the common noun *cat* denotes the set of animals that are cats). They combine with the noun modified via set intersection (e.g. a *vegetarian cat* is an animal that is both a cat and a vegetarian). For concreteness, and following Panzeri, Foppolo and Guasti (2013), we consider those GA adjectives that combine with degree expressions (*very tall*, *almost clean*) and enter into comparative constructions (*John is taller than Mary*). Although there is a debate and the distinction may not be categorical, GAs can be further distinguished into Relative GAs (e.g. *big*, *tall*, *fast*, *intelligent*) and Absolute GAs (e.g. *full*/*empty*, *open*/*closed*, *clean*/*dirty*) (e.g. Kennedy 1999). The interpretation of Relative GAs is always context-dependent. For example, we can say that John is tall for a 5-year-old child, i.e. when we compare John's height to the standard height at the age of 5. That is, in order to interpret relative GAs, we need to retrieve a contextual relevant standard of comparison, which vary from context to context. The interpretation of absolute GAs is claimed to be context independent instead, as the standard of comparison is the GA's upper or lower boundary (e.g. a glass is full when the liquid in it has reached the upper limit of the container). Data from acquisition have shown that children at age 2 are able to judge Relative GAs accurately (Ebeling & Gelman 1988), and from age 4 on, they can switch from one interpretation to the other (e.g, a cat is *big* in comparison to cat A, but small in comparison to cat B) (Sera & Smith 1987). In spite of that ability, children make a series of errors in the interpretation of GAs. First, the positive antonym of a relative GA (*big*/*small*) is comprehended before and better than its negative counterpart and this is often taken to mean the opposite: for example, young children treat *less* as if it meant *more* (Donaldson & Balfour 1968; Palermo 1973). Second, children exhibit extreme labelling: young children label as *tall* and *short* only the two extremes of a series of objects decreasing along the relevant dimension (height) (Smith et al. 1986; and Syrett 2007). Thus, findings about the use of GA are mixed. Investigations on Italian have focused on the question of whether children distinguish relative and absolute GAs and on the reason why relative GAs seem to elicit more errors.

The chapter is organized as follows. First, we report investigations about the production of quantified expressions and numerals (Section 2). Then, we discuss how children interpret sentences including negation and some other scope-bearing elements (quantifiers and modals) and point out some relevant facts that emerge from these investigations (Section 3). Next, we discuss Principle C data in the context of quantified expressions and in the context of reconstruction (Section 4). Then, we present data about the generation of scalar implicatures associated with the connective *or* and to the quantifier *some* in monolinguals, bilinguals, early L2 children and in children with SLI (Section 5). Based on this set of data from different populations of Italian-speaking children, we explain the delay in computing scalar implicatures that capitalize on metalinguistic abilities. Next, we turn our attention to the acquisition of the meaning of gradable adjectives and connect these results to the findings concerning the generation of scalar implicatures (Section 6). Finally, we conclude with summary and open issues.

## 8.2 Quantifiers in early speech

Italian-speaking children start to use quantifiers in their first utterances, as revealed by a survey of the transcriptions of five children from the Calambrone corpus (Cipriani et al. 1993) included in the CHILDES database (MacWhinney 2000). The first and most frequently used quantifier is *tutti* (all), which is already present in the speech of the 5 children between the age of 1;5 and 2;0 years. The construction *un po' di* (lit. a bit of) used with a variety of nouns (with a meaning comparable to the existential quantifier *some* in English) appears in the age range 2;0–2;5 years in the speech of one child, and later in the speech of two children. It was never found in the transcripts of 2 of the 5 children in the available data. In 69 transcripts, we have 119 occurrences of *tutti* and 9 of *un po' di*, for which some examples are given below:

(7)  a.  Guarda tutti li [=i] bambini come coggiono [=giocano]. (Diana, 2;6)
        Look all the children how (they) play-3-pl

    b.  Tutti i canini [=cani] hanno il collare. (Guglielmo 2;7)
        All the dogs have the collar

    c.  Perché uno ha ucciso tutti i cani. (Raffaello 2;6)
        Because one has killed all the dogs

    d.  Che ci vuol un po' di minettla. [=minestra] (Diana 2;8)
        That CI needs some soup

    e.  Mangiamo un po' di pane? (Martina, 2;7)
        Shall we eat some bread?

Numerals can be found in the earliest transcripts, in combination with nouns (this happens generally for the cardinals *one* and *two*), in isolation (in this use *1* and *2* are

more frequent, but *4*, *6*, *7*, *8* and *10* are also employed), and in sequences (one child has the sequence *1* to *10*, skipping *9*, in the age range 1;5–2;0; another child has the sequence *1* to *5* and then *7* and *8* in the age range 2:0–2;5). Usually, the sequence of numbers is not in the right order (2, 3, 4, 7, 8, 1, 3, 4, Diana, 2;4) (Wynn 1992). We may notice that the numeral *uno* (one) is homophonous with the indefinite article and the two are difficult to distinguish. This may explain its early and frequent use.

(8)  a.  Due mucche (Gugliemo, 2;3)
         Two cows

     b.  Voleva fregarmi due cucciolini
         (He) wanted to steal me two puppies

Thus, some words that convey expressions of quantification and cardinality are present in children's speech from very early. However, their mastery involves the acquisition of various properties, one of which is the assignment of scope that gives rise to different interpretations. Are Italian-speaking children able to obtain the different interpretations of scope-bearing elements? How do they obtain them and at which age? These are the topics of the following sections.

## 8.3   The acquisition of scope interactions

Musolino, Crain and Thornton (2000), based on the acquisition of English, observed that 5-year-olds often interpret sentences including negation and quantifiers based on surface order (see Lidz & Musolino 2002 for evidence from Kannada). Foppolo (2010) extended this observation to Italian by using numerals. Using the Truth Value Judgement task (TVJT), she tested children with sentences like in (9a), whose possible meanings are in (9b) and (9c).

(9)  a.  Due bambini non hanno nascosto il tesoro.
         Two boys not have hidden the loot

     b.  There are two boys that did not hide their loot.    two>NOT

     c.  It is not the case that two boys hid their loot.     NOT>two

Sentences like in (9) were uttered by a puppet at the end of a story featuring four boys, two of which hid their loot and two did not. Children were invited to say whether the puppet was right or wrong and explain their answer. On the surface scope interpretation given in (9b), (9a) is true in the context described, because two boys did not hide their loot. On its inverse scope interpretation in (9c), (9a) is false, because two boys hid their loot (the sentence would be true in a situation in which one boy hid his loot or in one in which no boy hid his loot). Four-year-old children said that the puppet was right, displaying a preference for the surface scope interpretation 70% of times.

These findings raise the question as to whether children also access the inverse scope reading. While in English this was tested by manipulating the pragmatic context of the experiment (e.g. Musolino & Lidz 2006 found that familiarizing children with the intended domain of quantification enhances access to the inverse scope reading), in Italian one can examine which scope relations children entertain by manipulating the syntactic context. Specifically, one can test whether children have access to the inverse scope reading by looking at the interaction between negation and post-verbal quantified subjects (likely focalized). In (10), the subject occurs in a post-verbal position, which is after the object (see Chapter 7 for a discussion on post-verbal subjects), and is c-commanded by negation. Nevertheless, (10a) is ambiguous between the two interpretations in (10b) and (10c). In other words, in spite of the occurrence of the subject in the post-verbal position, this sentence has the same range of interpretations that a sentence with a pre-verbal subject has, i.e. the sentence in (9a).[1]

(10)   a.   Non hanno centrato il bersaglio due signori.
             Not have hit the target two men
             'Two men did not hit the target.'
       b.   There are two men that did not hit the target.      Inverse scope: Two<not
       c.   It is not the case that two men hit the target.      Surface scope: Not<two

In the case of (9a) children interpreted the sentence based on the surface scope. If they do the same in the case of (10a), they should choose the interpretation paraphrased in (10c) in a situation in which two men hit the target and the other two men did not. On the contrary, if children have access to the inverse scope reading, we expect them to interpret (10a) as meaning (10b) and this is what has been found. In a first experiment, Foppolo (2010) tested sentences such as (10) in the same context used for (9a), but her results were equivocal. In a second experiment, she took more care of the context and tested a group of 4-year-old Italian-speaking children. According to Gualmini, Hulsey, Hacquard and Fox (2008), a pragmatic requirement states that a given interpretation is selected if it is an answer to a contextually relevant question or to a question under discussion (QUD). To meet the requirements of the QUD, Foppolo (2010) had a female puppet which provided instructions to four men about what it was expected from them (e.g. you have to hit your target), warning them that she would be disappointed if they did not fulfil their task. In this context, the sentence in (10) was a felicitous answer to the QUD: "Did all characters do what they were expected to do?". The story was presented to each child; two characters hit the target and two did not. At the end,

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1.   Some Italian speakers may find a sentence like "il bersaglio non l'hanno centrato due signori" (lit. the target NEG have hit two men, 'The target, two men didn't hit it') more natural, but in Foppolo (2010)'s experiment adults did not seem to have problems with sentences like in (10).

a second puppet uttered (10) and the child was invited to say whether the puppet was right or wrong. Italian-speaking children accepted (10) 98% of the time and correctly pointed to the characters that did not fulfil the task, i.e. that did not hit the target. This answer indicates that they accessed the inverse scope interpretation in (10b). Thus, Italian-speaking children can access both the surface and the inverse scope interpretation. In the last case, manipulation of the pragmatic context was necessary to meet the requirements of the QUD.

The sentences in (9) and (10) feature the presence of an indefinite subject. The quantificational nature of indefinites has been an issue of debate (Heim 1988; Diesing 1992). Heim claimed that indefinites are not quantificational on their own, and need to be treated as free variables that are bound by other quantificational elements in the sentence (such as an adverb). If there is no element in the sentence that binds them, then a default operation of existential closure provides an existential quantifier that binds them. By contrast, Diesing showed that indefinites can have their own existential force and are thus to be regarded as genuine quantifiers. The data from Foppolo (2010) contribute to this debate. If indefinites were only free variables, children should have preferred the surface scope interpretation in the case of (10). Being an indefinite, the post-verbal subject introduces a free variable that is bound within the VP (under the assumption that VP is the domain of existential closure, Diesing 1992). Negation would be higher and would have scope over it. However, this is not the result found. Children could interpret a post-verbal indefinite subject out of the scope of negation and thus could obtain the inverse scope interpretation. We conclude that indefinites can have quantificational force on their own and that children have access to this piece of information (see also Guasti & Chierchia 1999/2000 for evidence that indefinites possess quantificational force; see Section 4).

Another contribution of this experiment bears on the impact of post-verbal subjects on children's comprehension (see Chapter 7). The results show that Italian-speaking children do not have particular problems in assigning the correct interpretation to sentences including post-verbal subjects, under appropriate pragmatic circumstances.

Gualmini (2007) provided further evidence that Italian-speaking children can access the inverse scope reading. One group of 5-year-old children was tested with the TVJT by means of sentences like in (11a), where the relevant scope bearing elements that were manipulated in the experiment were negation and the existential quantifier *qualche* (some).

(11)  a.  Ogni contadino non ha pulito qualche animale.
         Every farmer did not clean some animal

      b.  Every farmer didn't clean some animal.

      c.  Every farmer is such that there is some animal he did not clean.

The context for (11a) comprised three farmers who were asked by an Indian to clean all the animals. All the farmers cleaned two animals; then, they considered cleaning the third, but in the end, they did not. On the surface scope reading in (11b), the sentence in (11a) is false, as all farmers cleaned some of the animals. On the inverse scope reading in (11c), the sentence is true.

Children accepted the sentence in (11a) 85% of the time, showing that they accessed the inverse scope reading (*some-not*). We may be cautious with this experiment, as *qualche* (some) in (11) may be a positive polarity item that cannot stay under negation (Szabolsci 2004), but has to scope out. Thus, the interpretation in (11b) is rather awkward and is blocked by a sentence like in (12), which expresses the meaning in (11b) more directly.

(12)  Ogni contadino non ha pulito nessun animale/alcun animale.
      every farmer not has cleaned no animal/any animal
      'Every farmer didn't clean any animal.'

Therefore, children might have answered *yes* accessing the inverse scope reading, simply because they have assumed that *qualche* (some) is a positive polarity item that has to scope out of the domain of negation. In any event, this finding indicates that children do not necessarily interpret quantifiers in the surface position, but are sensitive to their properties and have access to the inverse scope reading when this is the only available one or the most natural one.

Children's ability to go beyond surface scope was tested by Moscati and Gualmini (2008) (see also Gualmini & Moscati 2009, for additional evidence) based on the interpretation of sentences including deontic modals and negation (both in Italian and English). In Italian, negation is a clitic and thus precedes all verbs, in contrast to English where it follows modal verbs (no difference exists between lexical and non-lexical verbs in Italian with respect to their relative order with negation, see Belletti 1990). However, as far as meaning is concerned, negation interacts with other scope-bearing elements, like modals, as it happens in English. In the sentence (13a), negation precedes the modal verb, but the most natural interpretation of (13a), if not the only one, is in (13b), an interpretation in which the modal 'must' has wider scope than negation and the sentence is interpreted as a prohibition. The surface scope interpretation in (13c) is not natural.

(13)  a.  Il leone non deve stare nella stessa gabbia con la tigre
          The lion not must be in the same cage with the tiger

          Inverse scope *must-not* (prohibition)
      b.  It is necessary that the lion be not in the same cage with the tiger

          Surface scope *not-must*
      c.  It is not the case that the lion must be in the same cage with the tiger

Thus, if children have trouble with the inverse scope interpretation, they should have difficulties with the preferred interpretation of the sentence in (13), i.e. the inverse scope interpretation. To test this prediction, Moscati and Gualmini (2008) used a Question-After-Stories Task. A puppet, Dora, was working in a zoo and was given the instruction in (13). In the story for (13), there were two cages, in one there was a tiger and in the other there was a giraffe and Dora's task was to put two additional animals, a hippo and a lion, in each cage. As Dora forgot the instruction in (13), she asked the child the following two questions:

(14)   a.   L'ippopotamo può stare nella gabbia con la tigre?
            Can the hippo be in the tiger's cage?

       b.   Il leone può stare nella gabbia con la tigre?
            Can the lion be in the tiger's cage?

The answers to these questions depended on children's interpretation of the instruction in (13). If they understood the instruction on the inverse scope reading, the answer to (14a) should be *yes* (as (13) was a prohibition concerning the lion and the tiger and did not mention any restriction concerning the hippo) and the answer to (14b) should be *no*. If they interpreted (13) on the surface scope reading, the answer to (14a) should again be *yes*, but also the answer to (14b) should be *yes*. Five-year-old Italian-speaking children responded *yes* to (14a) 87% of the time and *no* to (14b) 93% of the time, suggesting that they were interpreting the sentence in (13) under its inverse scope reading. Similar results were obtained for English.[2] Thus, children have no trouble in accessing the inverse scope interpretation, when this is the preferred or the only natural interpretation. We should point out one weakness of this experiment, however. The surface scope interpretation is highly disfavoured, if available at all. One could claim

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2.   The sentences used for the English experiment included the modal can, as in (i). The preferred interpretation of this sentence is one in which negation has wider scope than the modal, as in (ii). The surface scope reading in (iii) is largely dis-preferred.

       (i)    The lion cannot be in the same cage as the tiger.
       (ii)   It is not the case that the lion can be in the same cage as the tiger.
       (iii)  It is possible that the lion not be in the same cage as the tiger.

The literal translation of (i) in Italian, given in (iv), is preferentially interpreted on its surface scope. As Gualmini and Moscati were interested in the inverse scope reading, they used the verb *must* for Italian.

       (iv)  Il leone non può stare nella stessa gabbia della tigre.
             The lion cannot be in the same cage as the tiger

Thus, the English and Italian sentences used in the experiments are equivalent. In fact, in modal logic not-possible is equivalent to must-not and possible-not is equivalent to not-necessary.

that (13) is not a genuine case of ambiguity, but represents a type of sentence in which one interpretation is highly disfavoured. Therefore, it is important to establish whether adults have access to the surface scope reading of (13) under some conditions in future work. Be that as it may, the finding lends support to the view that children can have access to the inverse scope reading and do not only rely on surface order.

To recap, we know that at age 4, the grammar of Italian-speaking children allows both the surface and the inverse scope interpretations from Foppolo's data and from Gualmini and Moscati's findings. Data from Italian add support to the idea that one crucial factor in resolving scope ambiguities is the relevance of the scopally ambiguous sentences to be possible answers to a QUD, i.e. what matters is the pragmatic context. This view is compatible with the idea that the surface scope is chosen preferentially not only by children, but also by adults, although to a lesser extent, when the context does not prime or enhance access to the inverse scope interpretation. This choice may depend on the fact that the surface scope reading is computationally less demanding; alternatively, it may be that this preference arises, because the surface scope reading is typically associated with a positive answer. Children, but also adults, may prefer to choose a positive answer, when they do not have strong evidence to give a negative answer.

## 8.4   Principle C, quantification and reconstruction

In (15a), the null pronominal subject, indicated with *pro*, can be bound by the indefinite expression *un pagliaccio* (a clown) or it can be free and refer to some extra-sentential character. In the first case, the sentence means that a clown was dancing and playing guitar, that is, *pro* is interpreted anaphorically. In the second case, the two actions were performed by distinct characters. This is called the exophoric reading. In contrast to (15a), *pro* cannot be interpreted anaphorically in (15b).

(15)   a.   Mentre (pro) ballava, un pagliaccio suonava la chitarra
            While (he) was dancing, a clown was playing the guitar

       b.   (pro) andava sul cavallo a dondolo, mentre un musicista suonava la tromba
            (he) was riding a docking horse, while a musician was playing the trumpet

In (15b), the bound anaphoric reading would result in a violation of principle C, as the R-expression *un musicista* (a musician) would be bound by the c-commanding null pronoun. The only legitimate interpretation is the exophoric reading, whereby the musician was playing the guitar and someone else was riding the rocking horse.

In a TVJ experiment testing comprehension of (15), Guasti and Chierchia (1999/2000) found that 18 Italian-speaking children with the mean age of 4;7 (age range 3;10–5;5) accepted both the anaphoric and the exophoric readings in the case

of (15a). When (15b) was used, they rejected the anaphoric reading 80% of the time. As expected, the same held true of adult controls. These findings support the claim that around 4;7 Italian-speaking children reject the anaphoric reading when principle C is violated, while they accept it when principle C is not violated.

In a second experiment, the two authors tested principle C with more complex sentences, involving reconstruction contexts. Consider (16).

> (16)  a.  Le scimmie hanno nascosto il tesoro di ciascun bambino, mentre
>           (pro) dormiva.
>           The monkeys have hidden the treasure of each child, while (he)
>           was sleeping
>
>       b.  Il tesoro di ciascun bambino, le scimmie lo hanno nascosto, mentre
>           (pro) dormiva.
>           The treasure of each child the monkeys have hidden it, while (he)
>           was sleeping

These two sentences are minimally different. In (16a) the direct object (*il tesoro di ciascun bambino* 'the treasure of each child') is located in its usual post-verbal position. In (16b), it has been fronted or left dislocated and is resumed by a clitic. The sentence in (16a) is ambiguous, as *pro* in the embedded sentence can be interpreted anaphorically, that is, it can be bound by the quantifier in the object complement (*ciascun bambino* 'each child'). In this case, the sentence means that the monkeys hid each child's treasure, while he (each child) was sleeping. Alternatively, (16a) means that someone else was sleeping while the monkeys were hiding the treasure of each child. This is the exophoric interpretation of *pro*. The same two interpretations are available in (16b), which minimally differs from (16a). Under a movement analysis of left dislocation (e.g. Cinque 1977; Cecchetto 2000), (16b) is identical to (16a), as a copy of the moved phrase is reconstructed in the complement position, as shown in (17a), where the copy is in italics. For completeness, we have to say that, to obtain the anaphoric reading, the quantifier in (16) has to receive wider scope over the sentence, as in (17b), where movement has occurred from the base or reconstructed position. From the scope position, the quantifier binds the null pronoun in the embedded clause (note that in (17b) the trace left by the quantifier is an R-expression, which is free in agreement with principle C).

> (17)  a.  Il tesoro di ciascun bambino, le scimmie lo hanno nascosto ⟨*il tesoro di
>           ciascun bambino*⟩, mentre (pro) dormiva.
>           The treasure of each child the monkeys have hidden it ⟨the treasure of each
>           child⟩, while (he) was sleeping
>
>       b.  Ciascun bambino$_i$, le scimmie hanno nascosto ⟨*il tesoro di t$_i$*⟩, mentre (pro$_i$)
>           dormiva.
>           Each child, the monkeys have hidden it ⟨ the treasure of t$_i$⟩, while (he$_i$) was
>           sleeping

Consider now the sentence in (18a), where a PP, *nel barile di ciascun pirata* 'in the barrel of each pirate' is left dislocated. Unlike (16), this sentence is not ambiguous. It can only mean that someone else put the gun in the barrel of each pirate, i.e. *pro* can only be interpreted exophorically. The anaphoric interpretation of *pro* is blocked in (18a) by principle C. As we did for (16b) (see (17a)), the left dislocated PP in (18a) is reconstructed in the post-verbal position and then the quantifier receives scope over the sentence as shown in the configuration in (18b). In this configuration, the trace of the quantifier, an R-expression, is c-commanded by the pronoun.

(18) a. Nel barile di ciascun pirata con cura (*pro*) ha messo una pistola.
In the barrel of each pirate with care (he) has put a gun

b. Ciascun pirata$_i$ con cura (*pro*) ha messo una pistola ⟨*nel barile di t$_i$*⟩.
Each pirate$_i$ with care (he) has put a gun ⟨in the barrel of t$_i$⟩

The same children, who were tested with the simple sentences in (15) above, were also tested with sentences like (16) and (18) by Chierchia and Guasti (1999/2000). These children accepted both the anaphoric and exophoric interpretation of the pronoun in the case of (16). However, they rejected the anaphoric interpretation of (17) 92% of the time. Adult controls behaved in the same way. Thus, we can conclude that Italian-speaking children access both the anaphoric and the exophoric interpretations of pronouns, when these readings are legitimate; however, they reject the anaphoric reading when principle C is violated.

Sentences (15)–(17) are relevant for our understanding of the comprehension of quantified sentences. In order to obtain the bound reading in (15a), we have to assume that indefinites have their own quantificational force and can move to a position, whence they have scope on and can bind the pronoun. Analogously, to create the configuration banned by principle C, the indefinite in (15b) has to move out from its pre-verbal subject position and leave there a variable or an R-expression. Since children access and reject the relevant readings that must be obtained by scoping indefinites, we can conclude that children know that indefinites have their own quantificational force and that quantifiers have to move (see Section 3 above). The same holds true of (16) and (17): to obtain the relevant configurations underlying the anaphoric reading the quantifiers must have scope over the pronoun. This is one of the first pieces of evidence lending support to the view that children know the movement properties of the quantifiers (see also Syrett & Lidz 2010, for similar evidence based on English).

## 8.5 Pragmatic knowledge: The case of scalar implicatures

In this section, we are going to examine children's interpretation of scalar elements, such as the connective *or* and the quantifier *some*.

### 8.5.1    Italian adults and children's interpretation of "or"

The scale including ⟨or, and⟩ was investigated in 5-year-olds and adults through a paradigm involving a bet by Chierchia, Guasti, Crain Gualmini, Meroni and Foppolo (2004). First, a puppet made a bet about what some props and toys in front of him were going to do, by uttering a sentence like (19).

(19)    Puppet: Scommetto che Batman prenderà un biscotto o una mela
         Puppet: (I) bet that Batman will take a cookie or an apple

Afterwards, a story was acted out in front of the child/adult, at the end of which the child/adult was invited to say whether the puppet had won the bet or not. In a typical story for (19), three outcomes were possible: Batman took both a cake and an apple, Batman only took an apple and Batman only took a cake. In addition to sentences of the kind in (19), sentences including *and* were also used in a context in which only one thing was taken. The purpose of this "and" sentence was to examine whether children distinguished between *or* and *and*. Results showed that children performed less well than adults did, but on average, like adults, they accepted (19), when only one thing was taken. They rejected a sentence obtained from (19) by replacing the connective *or* with *and* when Batman took only one thing proving that they distinguished between the truth conditions associated to the two connectives. However, children accepted (19) more frequently than adults, when Batman took both the cake and the apple. These results are reported in Table 8.1.

**Table 8.1.** Rate of acceptance of statements including conjunction and disjunction. Those occurrences that happened to be true in the situation are underlined (e.g. A or B means that A is true and B is not). Logical response refers to a response based on logical meaning without pragmatic considerations taken into account. In formal logic, *or* is true when both disjuncts are true (data from Chierchia et al. 2004)

| Type of sentences | Logical response | Children | Adults |
|---|---|---|---|
| A or B | Yes | 78% | 100% |
| A and B | No | 16% | 0% |
| A or B | Yes | 95% | 60% |

Acceptance of "A or B", when both disjuncts are true is higher for children than for adults, but it is not negligible for adults either. This must not be surprising, as the task employed does not invite the generation of a SI. In a betting task, neither the puppet nor the participants know the outcome. In such circumstances, it is appropriate to accept (19) in a situation, in which Batman took both pieces of food, because the puppet made a bet about what would have happened and did not simply describe a state of affairs. In such circumstances, even adults did not generate the SI most of the time,

because the context did not favor it. The use of a betting task was crucial in this study, as the authors wanted to test *or* also when only one disjunct was true. In fact, uttering (20) as a description of a situation in which Batman only took a cake is pragmatically very odd.

(20)    Batman took a cake or an apple.

This oddity may lead children to reject the target sentence or to say that the sentence is partially true on the ground that *Batman took a cake* would have sufficed to describe the given situation and the second disjunct is redundant. By contrast, betting that *Batman will take a cake or an apple* is perfectly compatible with a situation in which Batman will end up taking only a cake.

In summary, children at the age of 5 know the truth conditions associated with the items in the scale ⟨or, and⟩, but tend to generate the SI associated with *or* less than adults.

### 8.5.2    Italian adults and children's interpretation of "some"

The scale including *some* was more extensively investigated than the scale including *or*. Foppolo et al. (2012) conducted a series of experiments to investigate it. First, they conducted a developmental study with five groups of subjects: 4-, 5-, 6-, 7-year-olds and adults using the TVJT. A typical critical trial included five characters that had to decide which of two alternatives to choose. To place emphasis on quantity, the narrator emphasized the fact that there were many characters and that it would be very interesting to find out how many of them would choose one alternative over the other. (21) is an example of a story.

(21)    In questa storia c'è un gruppo di puffi in vacanza. Guarda quanti ce ne sono! Possono fare molte cose interessanti. Hanno una barca e possono fare un giro in barca. Hanno anche una macchina e possono andare nella foresta. Vediamo quanti scelgono la barca e quanti la macchina.

This is a story about a group of Smurfs that are on holidays. Look at how many there are! They can do many interesting things here. For example, they have a boat and they may go on a boat ride. They also have a car and they may drive in the forest. Let us see how many will choose the boat and how many the car.

The story went on with each character commenting about the two choices; in the end, all the characters opted for the same solution (go for a boat trip). At this point, the narrator asked the puppet to say what was happening in the story. The puppet described the outcome by using an underinformative statement containing *alcuni* (some), like in (22):

(22)    Alcuni puffi vanno in barca.
Some Smurfs are going on a boat ride.

This sentence should be judged false, if the SI associated to *some* is derived, despite being logically true. Subjects were asked to say if the puppet said it "well or badly", and if they did not agree with the puppet's statement, they were invited to explain what was wrong. Results showed a clear and sharp developmental trend, as shown in Figure 8.1.
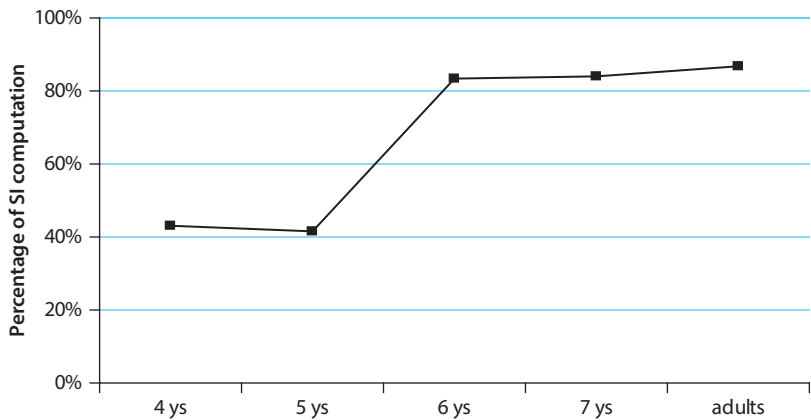


**Figure 8.1.** Percentage of rejection of underinformative statements (*some smurfs went on a boat ride* in a situation in which all smurfs went) as a function of age group (children from 4 to 7 years of age and adults) (data from Foppolo et al. 2012)

Six and 7-year-olds behaved like adults and rejected underinformative statements most of the time; 4 and 5-year-olds appeared to respond at chance level. However, under closer examination, the responses of 4- and 5-year-olds were not random. Children in this age range fell in two groups: one group consistently accepted all underinformative statements and one group consistently rejected them and behaved like adults. More specifically, the group, who rejected underinformative statements, included 30% and 58% of the 4- and 5-year-olds, respectively.

These findings invite the following conclusions. From the age of 6, children can derive SIs as much as adults, using a task like the TVJT. Before age 6, there are a number of children, who are less prone to generate SIs, with no significant difference between 4-and 5-year-olds. In other words, there is a sharp improvement from 5-year-olds to 6-year-olds. The question is why some children do not systematically derive SIs before age 6. The answer to this question is not easy. To better circumscribe the problem, we will proceed by excluding a number of possible answers and then we will speculate on some possible reasons why children are less likely to generate SIs before age 6.

### 8.5.3   Some prerequisites for generating Scalar Implicatures

The reason why children accept underinformative statements cannot be lack of knowledge of the meaning of *alcuni* (some) and *tutti* (all) (see Foppolo et al. 2012). At the

age of 5 years, children know that sentences including *tutti* (all) such as (23a) are true when all the smurfs went on a boat ride. They also know that (23b) is true when a subset of the smurfs went on a boat ride.

(23)  a.  Tutti i puffi sono andati in barca.
          All smurfs went on a boat ride

      b.  Alcuni puffi sono andati in barca.
          Some smurfs went on a boat ride

In addition, at this age children can also choose which of two statements better matches a given situation. To establish this fact, children were presented with pictures displaying 5 relevant characters involved in the same action. Two puppets learning Italian described the pictures. For the picture in Figure 8.2, one puppet uttered (24a) and the other (24b).



**Figure 8.2.** Example of stimulus used in the Foppolo et al.'s (2012) experiment

(24)  a.  Alcuni scoiattoli sono sul bus.
          Some squirrels are on the bus

      b.  Tutti gli scoiattoli sono sul bus.
          All squirrels are on the bus

The child's task was to decide which puppet said it better (Felicity Judgment Task; Chierchia, Crain, Guasti, Gualmini & Meroni 2001). On 95% of the cases, children accepted the most informative statement, i.e. (24b). This result suggests that children know that (24b) is more informative than (24a), i.e. that *all* is stronger than *some*, when the two alternative statements are readily available to them.

Foppolo et al. (2012) also established that children were able to detect violations of conversational maxims, in spite of the fact that they accepted underinformative

statements. They administrated the TVJT described in the previous session to a new group of 5 year olds. Then, the same children were submitted to a Conversational Violations Test (CVT) (Surian, Baron-Cohen and van der Lely 1996). This test is meant to examine subjects' ability to detect violations of 4 of the Gricean conversational maxims (the two maxims of quantity: be informative and avoid redundancy; the maxim of quality: speak the truth; the maxim of relation: be relevant) and of the maxim of courtesy (be polite) proposed by Brown and Levinson (1987). Children were presented on a laptop with 25 short conversational exchanges among three doll speakers, a male and two females. During each exchange, one female speaker asked a question to the other two characters, which in turn gave a short answer. One answer violated a conversational maxim, while the other did not. Children had to point to the doll that said something silly or rude. The test included five utterances for each maxim. In a typical trial for testing the First Maxim of Quantity, the answers were as in (25b, c), with (25b) designed to fall short of providing an informative enough answer and (25c) intended to be an informative answer. The target response was expected to be (25b), being this underinformative with respect to the question being asked.

(25) a. Speaker 1: Cosa hai mangiato a pranzo?
"What did you eat for lunch?"

b. Speaker 2: Del cibo
"Some food" (underinformative answer – expected target)

c. Speaker 3: Una pizza
"A pizza." (appropriate answer)

The TVJT replicated the findings of the experiment reported at the beginning. Five-year-olds were split into two groups, one including 62% of the children always accepting an underinformative sentence *some X P* in a situation in which *all X P* was also true and the other comprising 38% of the children always rejecting them. On the contrary, in the CVT children pointed to the puppet that violated the conversational maxim 88% of the time. The results obtained on the CVT confirms what was previously found in other studies for the control group of typically developing children by Surian et al. (1996) and by Siegal et al. (2009). Thus, children know the meaning of *some* and *all*, they know which item is stronger and choose the most informative statement. They also know Grice's maxims, including the quantity maxim, which is at the basis of the generation of SIs. One weakness of the CVT task is that some items are disputable and may not really investigate children's knowledge of Grice's maxims. For example, one question was "how many brothers do you have?" One puppet said 3 and the other said 500. Independently of Grice's maxims, but just based on world knowledge, it is clear that the second answer is silly. Thus, in future work, it is important to find examples more appropriate to test pragmatic inferences.

## 8.5.4    Experimental manipulations matter… to some extent

Generation of SIs or lack thereof is affected by the experimental settings. In another experiment, rather than administering only items belonging to one scale, as it has usually been done in most of the experiments testing comprehension of SIs, Foppolo et al. (2012) administered items belonging to different scales in the same experiment. In particular, they mixed numbers, quantifiers ⟨alcuni, tutti⟩ (some, all) and the scale ⟨un pezzo di, tutto⟩ (a piece of, whole). As in the previous experiments, 5-year-old children generate SIs less than adults. In addition, they were more accurate in rejecting underinformative statements in the case of numbers (97.5% rejection for (26)) than in the case of quantifiers like *alcuni* (some) (around 70% rejection for (27)). A similar discrepancy was reported by Papafragou and Musolino (2003) using a between subject design rather than a within subject one, as in the Foppolo et al.'s study.

(26)    Due puffi sono andati in barca.
Two dwarfs went on boat ride        SITUATION: three smurfs; all went on a boat ride.

(27)    Alcuni puffi sono andati in barca.
Some smurfs went on a boatride        SITUATION: five smurfs; all went on a boat ride.

Thus, children generate the SI associated to numbers, but they do so less in the case of quantifiers.[3] Results on *un pezzo di* (a piece of) were equivocal, and will not be discussed further, as children did not interpret this item as meaning a part of something, but in a numerical sense. This is likely due to the fact that, in Italian, the indefinite article in this expression (*un pezzo di*) is homophonous with the number 1, as we said

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**3.**    The status of numeral terms with respect to scalar items is debated both from the theoretical (e.g. Breheny 2008) and experimental side (e.g. Marty et al. 2013; Musolino 2004; Panizza et al. 2009). Musolino (2004) claims that numbers do not have the same semantics as quantifiers. In particular, he contends the view that children reject (26), because they generate a SI. On his view, numbers have an exact semantics, i.e. two means exactly two and children reject (26) because they know the semantics of numbers (see also Huang & Snedecker 2009). However, Panizza et al. (2009) have proposed that numbers start out as predicates with an exact interpretation. In fact, in (i) "two fast cars" in predicate position receives an exact interpretation.

(i)    Those are two fast cars.

When the predicate modified by a number is turned into an argument, it gets an at least interpretation. Therefore, (ii) is compatible with a situation, in which Simon has more than two fast cars. In this case, the exact interpretation is the result of a SI. Thus, there is an early stage of the semantic interpretation, in which the exact meaning is available and may intrude.

(ii)    Simon has two fast cars.

in session 1, and children interpreted *un pezzo* as meaning one and not two or more pieces, i.e. in a numerical sense.

In previous experiments, Foppolo et al. found that at age 5 (or earlier) children were split into two groups, with those generating SIs being 58%. In this new experiment, the proportion of children who generated the SI associated to *some* raised up to 75% (when *some* was in object position). Thus, the manipulation consisting in mixing scalar items succeeded in improving children's performance. Another piece of evidence that task and materials matter is reported in Guasti, Chierchia, Crain, Foppolo, Gualmini and Meroni (2005). These authors tested 7-year-old children with two tasks: a TVJT, like the one reported in the previous section, and a statement evaluation task (SET) adapted from Noveck (2001). In the SET, children were presented with oral statements read by a researcher and had to say whether they agreed or not. Some of the items used are reported in (28).

(28) a. Alcune giraffe hanno il collo lungo.
Some giraffes have a long neck (true, but underinformative)

b. Tutti gli elefanti hanno la proboscide.
All elephants have trunks (true)

c. Alcuni tulipani sono gialli.
Some tulips are yellow (true)

Although children were quite competent with all kinds of statements, they rejected underinformative statements like in (28a) only 50% of the time, much less than adults (with rejection rate 87%). If 7-year-olds received some training before the task that emphasized the notion of being as accurate and informative as possible in describing objects or persons (e.g. name a person *cook* and not simply *man*), their rejection rate increased, but when retested a week after the first test, their rejection rate decreased again. In addition, when the same children were tested with the TVJT, their rejection rate was almost at ceiling. Thus, children at 7 years of age reject underinformative statements in some circumstances (for example, when the TVJT is used), but much less in others (when the SET is employed). Bagassi, D'Addario, Macchi and Sala (2009) obtained similar outcomes. Four- to six-year-old Italian-speaking children rejected underinformative statements more frequently when the goals of the experimenter were made clear to them and when they understood that they had to establish the adequacy of a statement. The fact that manipulation of the pragmatic set up matters and leads to children's higher generation of SIs is proven by a study by Meroni and Gualmini (2013) with English-speaking children with mean age of 4;10. These authors manipulated the question that was asked to the puppet after the story. Rather than simply asking a generic question, like *what happened in the story?*, they asked a more relevant question, like *were some/all pizza delivered?*, in a situation in which the topic was precisely the delivering of some or all pizza. They found that children generate SIs in 90% of the cases.

In summary, at age 5, children do not generate SIs as much as adults. However, their unwillingness to generate SIs can be influenced by manipulations of the experimental tasks, by the material used and by the clarity of the requests.

## 8.5.5   Children are not underinformative speakers

Another relevant finding is that although children at 5 years of age generate SIs less than adults, they do not produce underinformative statements (Foppolo & Guasti 2005). This was established through an elicited production task. Children were presented with stories in which 10 smurfs received all the same prize, e.g. a candy, because they achieved the expected goal. Then, the master decided to give them some additional prize. He had 5 hats and 5 marbles. Therefore, he gave marbles to 5 smurfs and hats to the other 5 smurfs. At the end of the story, children were invited to describe what had happened. When they had to describe the fact that all smurfs got a candy, they rarely uttered underinformative statements (there were 4 out 73 statements of this kind, i.e. 5%). In the case of universally quantified sentences, they used *tutti* (all) or sometimes they use *tanti* (many). For existentially quantified sentences, various items were used: *alcuni*, *certi*, *dei* (the partitive plural article), *qualcuno* (someone), *altri* (others), *un po'* (a bunch) and *metà* (half). One error that was produced by 3 children (out of the 23 children that were tested) was the production of (29b) rather than the target (29a).

(29)   a.   Tutti hanno il cappello o la biglia.
             All have the hat or the marble

       b.   Alcuni hanno il cappello e alcuni hanno la biglia.
             Some-PL have the hat and some-PL have the marble

The statement in (29b) would have been appropriate if the connective *or* rather than *and* would have been used, as all smurfs had the hat or the marble. Thus, in general, errors are rare and children are accurate in using quantified sentences.

## 8.5.6   Where are we?

The facts presented thus far invite the following conclusions. It is uncontroversial that there is a developmental effect in the generation of scalar implicatures during sentence comprehension. The developmental trajectory does not seem gradual, but rather abrupt: there is a sharp increase in the generation of SIs from age 5 to age 6. With the TVJT, 6-year-old children reject underinformative statements, i.e. generate SIs as much as adults, but they do so less than 5-year-olds. It is also uncontroversial that the task or the specific manipulation matters. Some more naturalistic tasks, as the TVJT, lead to a higher rate of generation of SIs than other tasks, as the SET (see also Pouscoulous, Noveck, Polizer & Bastide 2007, for another task that led to some

improvement). An initial training whose function may be of focusing children's attention to the task's demands (being pragmatically appropriate and not paying attention to truth or falsity) also leads to improvement, but only when children are tested immediately after the training; the effect does not persist for a long period. Overall, children turn out to be quite competent pragmatic comprehenders:

i.   They know the meaning of quantifiers *alcuni* (some) and *tutti* (all).
ii.  They seem to be able to detect violations of Grice's conversational norms, in particular of the maxim of quantity, which is involved in the generation of SIs.
iii. They can compare statements that differ in quantity of information and choose the most informative, i.e. they can meet expectations of relevance.
iv.  From iii, we infer that they seem not to have memory limitations that prevent them from handling two representations at the same time.

In fact, if children can choose between two statements, as stated in (iii) on the list above, then they must have enough memory resources to keep the two statements in memory. In addition, to the competence displayed in (i) through (iv) above, it has been found that children recognize that an underinformative statement is not optimal. This has been established based on English through an experiment in which children had to reward a puppet who uttered a statement. If the statement was underinformative they could reward the puppet with a medium strawberry; if the statement was wrong, they could give him nothing and if the statement was informative they could give him a big strawberry (Katsos & Bishop 2012). It was found that children gave a medium strawberry when the statement was underinformative.

Given this rich system of knowledge and the ability to meet communicative expectations, it is rather puzzling that 5-year-olds are weak in generating SIs in comprehension. The fact that they can detect conversational violations, including the maxim of quantity, and can evaluate degrees of informativeness suggests that they are pragmatically rather competent. To gain some additional insights that can help us to disentangle the puzzle, we turn our attention to bilingual subjects and children with specific language impairments.

### 8.5.7   Conversational understanding in bilingual children

So far, we have concentrated our attention on pragmatic abilities in monolingual Italian-speaking children. To widen our perspective and better understand the nature of the delay observed in the generation of SIs, it is also necessary to examine the conversational understanding of bilingual subjects. Siegal, Iozzi and Surian (2009) tested monolingual Italian-speaking and Italian-Slovenian simultaneous bilingual children from 3;6 to 6 years of age, using the conversational violation test (CVT) mentioned in Section 5.3. These children were also administered a vocabulary test and two executive

functioning tasks measuring the ability to inhibit a response and the ability to shift focus of attention, respectively.[4] These two tasks were the Day-Night and the Card Sort task. The Day-Night test requires participants to inhibit the labelling of a picture displaying the sun or the moon, respectively, with the words *day* or *night*, in order to permit the opposite labelling, i.e. *night*, when they see the picture depicting the sun and *day*, when they see the picture displaying the moon. The Card Sort task requires inhibition of a previous rule of categorization e.g. categorization by shape, and use of a new rule of categorization (e.g. by colour). The results of the study showed that Italian-Slovenian bilingual children were delayed on vocabulary acquisition, as it often happens with bilingual children. On the two executive function tests (i.e. Day-Night and Card Sort) no difference was observed between monolingual and bilingual children. However, on the CVT, bilingual children outperformed their monolingual peers, i.e. they were better than monolinguals at detecting conversational maxim violations and thus at singling out the most appropriate answer in the context. This last result is a hint that bilingualism may enhance pragmatic abilities. Previously, we expressed some words of caution with respect to the CVT, as some items may not really test Grice's maxims. We reiterate this point, but note that bilingual children may be better equipped to handle conversational situations since they have to switch from one language to the other as required by the conversational setting. This fact may influence their ability to perform pragmatic tasks. It would have been interesting to test the same bilingual subjects with the SIs test to establish whether such an advantage could also be observed in the case of SIs and if and how scores on CVT and on the SI test could be related. Unfortunately, this was not carried out with Italian-Slovenian bilingual subjects.[5]

A different early L2 (EL2) group (i.e. successive bilingual children) has been studied by the second author using the Cave-girl task devised by Katsos and Bishop (2012). The study aims at assessing their semantic knowledge of various quantifiers (*tutti* (all), *non tutti* (not all), *nessuno* (nobody), *alcuni* (some) and their pragmatic understanding. In this task, Susanna, a beginning learner of Italian, had to arrange various objects into various boxes and then to describe what she had done. For example, in one situation she said *all oranges are in the boxes* in a situation in which only some were. Children were invited to say whether she was good or bad in describing the situation. Twelve EL2 children with a variety of Arabic as their L1 and ranging in age from 3;10 to 5;10

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4.  Executive functions refer to a series of functions that are responsible for planning, inhibiting automatic responses, selecting relevant sensory information, handling new situations.

5.  Siegal, Matsou and Pond (2007) investigated the ability to generate SIs in 4–6 year olds Japanese-English simultaneous bilingual children compared to monolingual children, but their results were equivocal.

(M = 5;2, SD = 0,5) were tested. They were matched for age, sex and socio-economic background to 12 monolingual Italian-speaking children ranging in age from 3;8 to 6 (M = 5;2, DS = 0,6). By parental report, all bilingual children had been exposed to a variety of Arabic from birth and very little to Italian. Their constant and continuous exposure to Italian started around 2;6–3 years, when they entered Italian public day care centers.

Children were administered the Cave-girl task and some other tests, among which a test for vocabulary comprehension (PPVT). It was found that successive bilingual children were about 2 standard deviations below the mean of the norms for Italian-speaking monolingual children in the vocabulary comprehension, replicating some-how Siegal et al. (2009)'s finding. Their semantic and pragmatic competence was not superior to that of monolingual children, as apparent from Figure 8.3. As a group, EL2 were weaker than L1 children in the comprehension of quantified sentences. As for underinformative statements, EL2 children provided a low percentage of pragmatic answers.
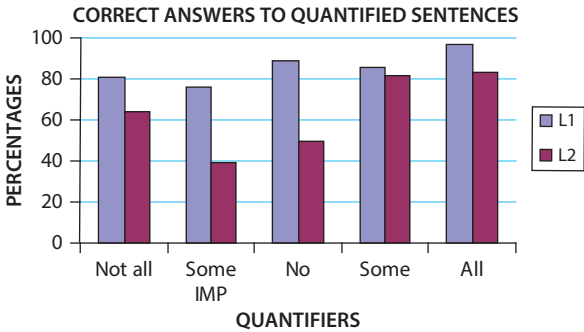


**Figure 8.3.** Percentage of correct answers by L1 (monolingual) and EL2 children for each quantifier tested. For underinformative sentences (*Some IMP*), correct answers are rejections of the relevant statements, because they are underinformative

The distribution of children as a function of how many times they answered pragmatically (i.e. they rejected) to underinformative sentences with *alcuni* (some) is reported in Table 8.2. It is apparent that most of the monolingual children answered correctly or almost correctly (9 children, i.e. 75% of the children in the monolingual group), while early L2 were split into two groups, one always answering correctly (4 children, i.e. 33%) and one answering always or most of the times incorrectly (8 children, i.e. 67%). An analysis of proportions applied to the frequency of L1 and of EL2 children that answer correctly to underinformative statements yields a significant result (p < .05).

**Table 8.2.** Distribution of children as a function of how many times (from 0 to 5) they answer correctly (that is, reject) to underinformative *some*-sentences

| Responses | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Early L2 | 6 | | 2 | | | 4 |
| Monolinguals | 1 | | 2 | | 1 | 8 |

The finding that children are split into two groups is not uncommon in the literature on SIs, as we have already discussed, and is indicative of an earlier stage of development than that observed in the L1 group. This is further confirmed, if we analyze the data according to a more lenient criterion. When children answered incorrectly, they were asked to explain their answers. Looking at these explanations is revealing. Although children accepted underinformative sentences, they added a statement in which they specified that ALL of the relevant objects were in the boxes. Similarly, for the other quantifiers, children may have offered a wrong answer but their justification suggested a correct comprehension. Considering these responses correct (because the justification is correct), we obtain the results displayed in Figure 8.4.
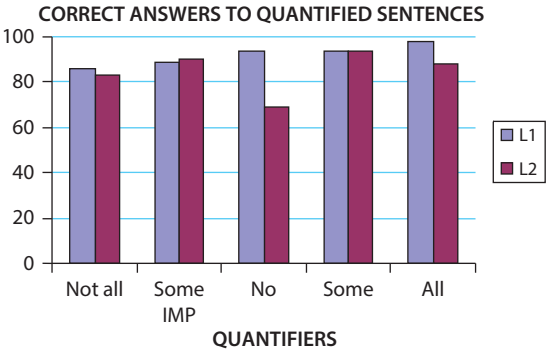


**Figure 8.4.** Percentage of correct answers by L1 (monolingual) and EL2 children based on the lenient scoring criterion (i.e. considering correct responses in which the explanation offered is correct)

As we can see in Figure 8.4, the performance of EL2 children is lower than that of monolingual children only in the case of the negative quantifier, a fact that deserves further investigation. Regarding the sentences involving the generation of a SI, the performance of EL2s children improves dramatically and the percentages of correct answers equals that of monolingual children (around 90%). Moreover, in this second scoring, only one early L2 child answered logically 6 times out of 6. The other children always answered pragmatically, rejecting underinformative *some*-sentences. Similarly,

only one monolingual child continues to answer incorrectly. Thus, when we consider the explanation offered by the children, early L2 and monolingual children do not differ any longer.

In conclusion, bilingual and EL2 children may not have a disadvantage with respect to monolingual children in their pragmatic competence. In this respect, they seem to have a shorter delay in pragmatic skills than in other linguistic areas, like vocabulary comprehension. This study does not provide evidence of an EL2 advantage in pragmatic understanding. Further research are needed that take into account the type of bilingualism or EL2.

### 8.5.8    Pragmatic skills in children with specific language impairments

In a study by Arosio, Branchini, Forgiarini, Roncaglione, Carravieri, Tenca and Guasti (2010), semantic and pragmatic abilities were assessed through the Cave-girl task described in the previous session. It was found that children with SLI (Mean age 6;10) were weaker than age matched control children in responding to underinformative sentences. However, they were like age matched controls in the comprehension of quantified sentences that did not require any specific pragmatic understanding, i.e. sentence including quantifiers such as *all*, *nobody*, *not all* and *some* (in a context in which only a subset of the characters did some action). To better appreciate this finding, it is interesting to know that these same children were poorer than both age matched and language matched control children (mean age 5;7) in the production of clitics (see Arosio et al. 2010, 2014; see Chapter 3, Section 4.1). In other words, the performance of children with SLI in the production of clitics is lower than that of 5;7 year-old children, but in the generation of SIs it is just lower than that of age matched control children (mean age 6;10). These findings indicate that children with SLI do not have problems with basic aspect of semantics; they are slightly impaired in the generation of SIs, although they are severely impaired in the production of clitics.

### 8.5.9    Taking stock. Why are children more logical than adults?

According to some accounts (e.g. Noveck 2001), children are less willing than adults to generate SIs, because computing an implicature is costly. We may note that not only children find it difficult to derive SIs, but under some circumstances adults do so too. For example, even adults overaccept underinformative statements when the task is not explicit, as it is the SET above (Noveck 2001; Guasti et al. 2005), or the intention of the experimenter are equivocal, as pointed out in Bagassi et al. (2009), or when they are under time pressure or when they have to accomplish two parallel tasks (Bott & Noveck 2004; De Neys & Shaenken 2007).

One possible explanation for children's failure to generate SIs is their shortage of computational resources. This conjecture would be in line with the fact that adults as

well do not generate SIs under conditions of time pressure or of dual tasks. Katsos and Bishop (2012) have offered an alternative explanation. These authors suggest that children's behaviour is motivated by pragmatic tolerance. In other words, as underinformative statements are not patently false, children do not think that they deserve to be rejected. Under this view, what develops is a metalinguistic ability that leads children to reject underinformative statements in conversation. Beyond the fact that it is not clear what this ability amounts to, the tolerance account suffers from some drawbacks. First, it is surprising that children become less tolerant (and thus reject underinformative statements more frequently) when training is supplied or when the requests are clearer. Second, the tolerance account does not fare well with the results from the children with SLI, as it is unclear why a language problem should lead to less tolerance.

A more promising line of investigation is discussed in Foppolo et al. (2012). According to this view, rejection of underinformative statements rests on the development of the metalinguistic ability that allows one to recognize that there may be multiple (linguistic) representations of the same physical object or scene. These multiple representations are all equally optimal in general, but in concrete situations, they are not all relevant. In fact, in the case of SIs the same situation, 5 elephants eating, can be described by saying *all elephants are eating* or *some elephants are eating*. Both sentences are true; the former is optimal if we have to describe a situation in front of us. The second one is also optimal, but in a different conversational setting, e.g. if we are betting or guessing. Children are sensitive to these different conversational settings from age 4 or even earlier; in fact, they respond differently to statements involving scalar items depending on whether the statements are descriptions of state of affairs or bets about what will happen (see Section 5.1 above). However, it is likely that the metalinguistic ability to choose the appropriate answer depending on the context requires some time to fully develop or to become automatized. Bilingual children may be more skilled, because they have to constantly deal with two languages and they know that they have to switch from one to another depending on the conversational setting (which language the listener speaks) or on the purpose of the conversation. Both languages are optimal for conversation, but whether one is more appropriate than the other depends on the situation and on the conversational partner. Children with SLI may be slightly worse than age matched control, not because they are impaired in generating SIs, but because their primary language problem and their slow language development delay the development of their metalinguistic abilities. Under this view, the impairment of these children with SIs is not primary, but secondary, and is a consequence of the primary linguistic problem. This line of explanation fits well with Gopnik and Rosati's (2001)'s finding, namely, that 3- and 4-year-old children do not reverse ambiguous figures (e.g. Rubin vase) even when they are informed of the alternative and fail to understand that the same stimulus can give rise to two alternatives. By contrast, a majority of 5-year-olds can reverse when they are informed that there is an alternative, but not

in an uninformed situation. In addition, children who reversed passed a false belief task[6] indicating that they can entertain multiple abstract representations of some situation (what is really inside the box and what one thinks is inside a box). Thus, 5-year-olds begin to see that there are multiple perceptual and abstract representations of the same physical object or scene, if they are explicitly told about this. In the same vein, Sodian (1990) showed that 6-year- olds, but not 4-year-olds, can understand when a sentence has more than one interpretation, i.e. they are sensitive to the fact that the same perceptual string of words can have two distinct syntactic representations and be interpreted in two ways. Similarly, children at age 6, but not at age 5, reject under-informative statements because they become sensitive to the fact that the same string has more than one use as a function of the context.

To sum up, it is possible that the metalinguistic ability to appreciate multiple representations and to choose the appropriate one in the context underlies the generation of SIs. This explanation also links directly to the fact that some tasks lead to drastic improvement in the rate of SI computation.

## 8.6   Gradable adjectives

Acquisition of the meaning of gradable adjectives (GA) presents some similarities to acquisition of SIs, as it will become apparent as this section unfolds. Panzeri, Foppolo and Guasti (2013) tested the comprehension of Relative GAs (*e.g. grande* 'big', *alto* 'tall', *piccolo* 'small', *corto* 'short (for length)') and of absolute GAs (e.g. *pulito* 'clean', *chiuso* 'closed', *pieno* 'full', *sporco* 'dirty', *aperto* 'open', *vuoto* 'empty'). Participants comprised two groups of children aged 3 and 5, respectively, and one group of adults. All participants were submitted to a TVJT and a Scalar Judgment Task (SJT). In the TVJT, a puppet described an object by using an adjective (e.g. *Questo è grande*, 'this is big') and the participant had to say either whether the puppet's description was accurate or whether she couldn't decide. Objects did not evoke any specific function to avoid the retrieval of a standard of comparison. The object used in the TVJT was extracted from a scale of seven objects decreasing along the relevant dimension (e.g. size). The whole series of objects was employed in the SJT. Figure 8.5 depicts the scale

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6.   In this task, children were presented with a crayon box and asked what they think was inside. After the child had responded (e.g. crayons), the experimenter and the child verified the content of the box. After opening it, the child could see six birthday candles in the box. The experiment asked the child *what really is in the box?* After the answer, she closed the box again and asked the child *what did you think was in the box before opening it?* Then she also asked *what do you think your friend would think is inside the box, if she sees it closed like that?* Children who responded *crayons* were coded as passing the task.

used in the SJT for big/small. The second and the sixth element of this series were used in isolation the TVJT for big and small, respectively.
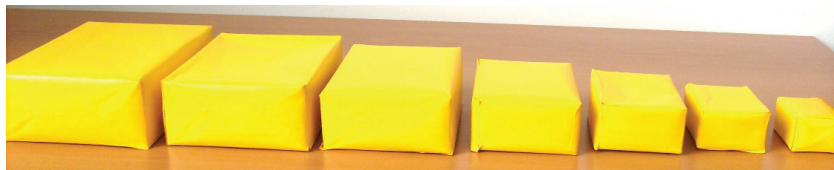


**Figure 8.5.**  Example of material used in the experiment of Panzeri, Foppolo & Guasti (2013) to test how children evaluate staments containing the adjective *big* wih respect to the objects shown

The SJT was modelled after Syrett (2007). Participants were presented with series of seven objects each, like in Figure 8.5, and for each item they were asked "Is this *Adjective*?". For Figure 8.5, the question was *È grande?* (Is this big?). The results of the TVJT revealed that for Absolute GAs, adults and 5-year-olds always accepted statements like *questo è sporco* (this is dirty) when the target object was minimally dirty and rejected statements like *questo è pulito* (this is clean) referred to the same object. By contrast, 3-year-olds were similar to adults and to 5-year-olds in accepting the statement *questo è sporco* (this is dirty) when the object was minimally dirty, but they differed from the other two groups, as they failed to reject consistently *questo è pulito* (this is clean) referred to the same object (that is, they accepted that an object minimally dirty can be considered to be clean). For Relative GAs (e.g. This is big), a developmental trend emerged. To a sentence like *questo è grande* (this is big), adults answered *non so* (I can't tell) 60% of the time. Therefore, in the context, in which an abstract object was presented in isolation, adults could not interpret sentences such as *questo è grande* (this is big), because they lacked the standard of comparison. In the same condition, 3-year-olds tended to accept the description and 5-year-olds laid in-between 3-year-olds and adults, that is, they also tended to accept "This is big" to a certain extent in a situation in which there was no standard of comparison. Answers to control items showed that children could provide "I can't tell" responses when this was appropriate. Thus, their over acceptance cannot be attributed to failure in understanding the task or to a tendency to answer in the positive when they are confused.

The results of the SJT lead to a different picture. Consider Figure 8.6. For absolute GAs, responses (left side of Figure 8.6) were more categorically than for relative GA (right side of Figure 8.6). Both children and adults, rejected *questo è sporco* (this is dirty) only for the last object of the series of 7 objects and accepted *questo è pulito* (this is clean) only for the first object of the series of 7 objects (see Figure 8.5). For relative GAs, the acceptance of statements like *questo è grande* (this is big) or *questo è piccolo* (this is small) constantly decreased across objects and dropped below 50% at the 4th object. Interestingly, adults and children displayed the same pattern.
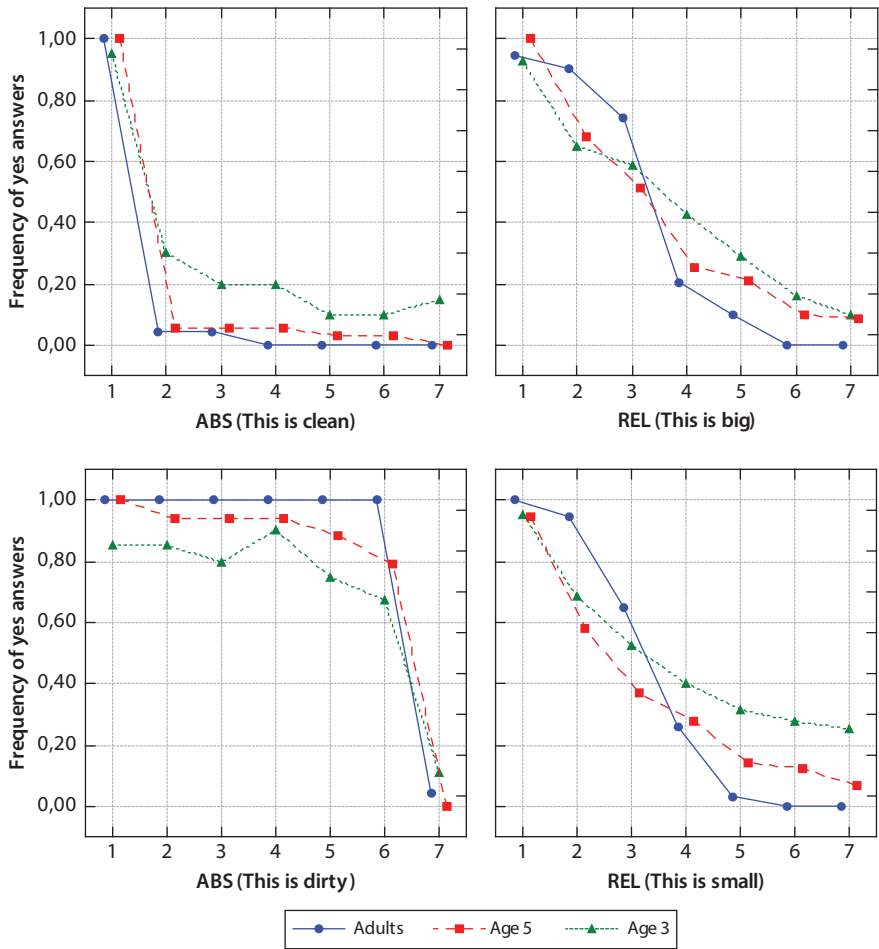
**Figure 8.6.** Frequency of *yes* answers in the experiment on scalar adjectives by Panzeri, Foppolo and Guasti (2013). The left graphs report responses to absolute gradable adjectives and the right to relative gradable adjectives. On the X-axis are the 1 to 7 objects; on the y-axis we have frequency of *yes* responses for each of the seven objects. Data are from 3- and 5-year-olds, and from adults

This set of findings proves that children distinguish between relative and absolute GAs, when the standard of comparison is provided as in the SJT. When it is not, as in the TVJT, they are more willing to accept relative GAs (*questo è grande*, this is big) in situations in which adults do not and answer *non so* (I can't tell), instead. In addition, 3-year-olds overaccepted statements with absolute GAs, like "this is clean" even in situations in which something was not maximally clean, e.g. when it had only a small spot on it. These results share some similarities to those obtained in investigations on SIs. In that case, children accepted underinformative statements more than adults did;

for example, they accepted *some Xs P* even if *all Xs P*. In a sense, they seem to be happy to accept a reading that is minimally adequate and minimally informative about the situation. To recall, if *all Xs P* is true, then also *some Xs P* is true. However, *some Xs P* is not the most appropriate statement in a situation in which the predicate holds true for all Xs. In the case of GAs, children accepted "this is clean" even if the object was not completely clean, that is, even if its cleanliness did not reach its standard, but it was almost clean. They also overaccepted "this is tall", because the relevant object had some vertical extension (a property that is presupposed by the adjective tall), as it will become clear in a moment.

Building on this insight, Panzeri, Foppolo and Guasti (2013) explained these facts by adopting a hypothesis put forth by H. H. Clark (1970), which is based on the observation that Relative GAs have two interpretations, displayed in (30).

(30)    a.    Andrea is 167 cm tall.
        b.    Andrea is tall.

In (30a), the adjective *tall* has a neutral reading and indicates that the relevant dimension is height and the information is that this height is 167 cm, while (30b) shows its "comparative" meaning: Andrea is taller than some relevant standard of comparison. On the first reading, *tall* has a nominal interpretation and denotes the set of individuals that simply have a vertical dimension of 167 cm. According to Clark, children initially adopt this interpretation, while the comparative meaning is acquired later. This hypothesis immediately explains the behaviour of 3- and 5-year-olds, who overaccepted *This is big* in the TVJT. In that case, children attributed to *big* (and *small*) a nominal reading and took it to mean *this has a vertical and horizontal extension*. Therefore, they accepted the statement "This is big" as accurate to describe objects with a vertical and horizontal extension, such as the boxes presented in isolation. Five-year-olds were less likely to accept this reading, as they were in the process to switch to the comparative reading. Note that the nominal reading provides little information: it just tells us for (30a) that Andrea's vertical extension is 167cm. It does not tell us anything about how Andrea's height compares to other relevant people's height. The comparative reading would have provided more information, in this respect.

To recap, children, like adults, distinguish relative and absolute GAs, as shown in the SJT, when the standard of comparison is provided. Similarly, in the case of SIs, children can choose the most informative statement (*all Xs P*), when the alternatives are readily available to them (as in the Felicity Judgement task discussed in Section 4.3) or when the situation is clearly supportive of the scalar implicature reading (Section 5.4). When objects are presented in isolation, children and adults display different behaviours. These can be seen as different ways to cope with the impossibility of retrieving the relevant standard. Three-year-olds overaccept *this is clean* when something is minimally clean or they accept *this is big* when the relevant object has at least some

vertical and horizontal extension (regardless of how it compares to other object with the same type of extensions). In other words, children start out with an interpretation that is minimally true.

To further prove that the nominal interpretation may intrude even in adult judgements, Foppolo, Panzeri and Guasti (2013) showed that adults can be turned into children by manipulating the experimental demands in the TVJT. In this new experiment, adults were administered the same TVJT that was described above, but they were instructed through specific training to be more tolerant about the puppet's descriptions and to answer only in the positive or in the negative, that is, the *non so* (I can't tell) answers were forbidden). The results of these manipulations were that adults accepted *this is big*, when the object was presented in isolation on 80% of the time, while they did so only 40% of the time in the first experiment. They accepted *this is clean*" 60% of the time, when the object was not maximally clean, i.e. it had a small spot (while they did so only 30% of the time in the first experiment). Thus, under specific circumstances the nominal reading can also be evoked in adults.

## Summary and open questions for future research

The focus of this chapter was the acquisition of certain aspects of sentence meanings. Specifically, we discussed the scope interactions between negation and quantifiers/modals, the generation of scalar implicatures and the interpretation of gradable adjectives. We showed that Italian-speaking children at the age of 5 years can access both the surface and inverse scope reading of sentences including scope bearing expressions. This was established by examining the interpretation of sentences including a quantified subject and negation and capitalizing on the availability in Italian of pre- and post-verbal subjects. Access to the surface scope was evident in sentences including a pre-verbal subject and access to the inverse scope was observed in sentences including a post-verbal subject. In this latter case, a manipulation of the context was necessary so that the target sentence could be seen as the answer to the Question Under Discussion (QUD), that is, it was necessary to highlight the inverse scope reading of the relevant sentence by making it relevant to the context. In future research, it would be worth testing sentences with pre- and post-verbal subjects in more uniform contexts. The QUD manipulation was implemented only with sentences featuring a post-verbal subject and displaying an inverse scope interpretation. Was this manipulation necessary due to the type of interpretation to be obtained or was it due to the position of the subject? Future research may tease apart these two possibilities, as this would also bear on the status of the post-verbal subject. At present, one may speculate that the QUD manipulation is necessary to support a more challenging interpretation (inverse scope) with respect to a more parsimonious one (based on surface scope), under the

assumption that the surface interpretation is the default. In this respect, it would be crucial to establish, whether for Italian adults the surface reading is really the default reading. Initially, an experiment like one of those conducted with children or a questionnaire would be enough. An online study may be needed to establish whether a default reading is initially considered, but quickly abandoned. An alternative is that children can access the relevant reading, when the pragmatic context for this reading is available. When it is not, it is necessary to figure out what the speaker intended; in this case, children err or may end up with a reading that is not the intended one.

In any event, data from Italian reveal that children have access to both surface and inverse scope interpretations, in the case of sentences including negation and a quantified subject and in the case of sentences including negation and modals.

We also have reviewed evidence showing that 5-year old children are less likely than adults in generating SIs, in spite of the fact that they know that some sentences are more informative than others and that they are pragmatically competent. In addition, we have shown that EL2 children, in spite of having been exposed to Italian with delay, did not exhibit a marked delay with respect to monolingual control children. This was in contrast to what was found in vocabulary comprehension. EL2 children in this case were 2 SD below the means of monolingual control children. Thus, it is possible that exposure to two languages enhances pragmatic skills. Similarly, children with SLI, who are otherwise weak in areas of morphosyntax, were not different from language matched children in pragmatic tasks.

This pattern of results was explained by saying that children might not always generate SIs, because they failed to understand that a sentence can have multiple meanings and that some are more appropriate than others in a given context, although all are true in that context. This conjecture was inspired by the observation that bilingual children seem to be more prone to reverse ambiguous figures. If this line of explanation is correct, future research should find a correlation between the ability to detect sentence ambiguity, to generate SIs and to reverse ambiguous figures. In this respect, it is interesting to notice that it is precisely at age 6 that children were found to generate as much SIs as adults in Foppolo et al's (2012) study and it is at age 6 that children are sensitive to sentence ambiguity (Sodian 1990). Although it is possible that these convergences are accidental, they are all the more surprising.

An alternative line of explanations may be worth exploring in the case of SIs. Sentences including *some* are true in more situations than sentences including *all*. In fact, *all*-sentences are true in a subset of the situations in which *some*-sentences are true. In order to reject *some*-sentences, children have to put *some* and *all* on the same scale and this in turn requires that children compute an inclusion relation. As we have shown in Chapter 5, Section 4, children are challenged by the computation of inclusion relations on relative clauses. Thus, it is possible that children do not routinely compute SIs because they avoid the computation of inclusion relations. If this line of explanation is

on the right track, we should find some parallelism between the generation of SIs and the comprehension of relative clauses.

Finally, we discussed the acquisition of the meaning of gradable adjectives (GAs). Although children could distinguish absolute from relative gradable adjectives, they were more willing than adults to accept "This is tall" when no standard of comparison was offered. Three-year-olds accepted description such as "This is clean", when the object had at least a minimum amount of cleanliness, even if it was not maximally clean. This behaviour is similar to what we have also observed in the case of SIs: children tend to assign to *some* the *at least* interpretation more often than adults do. The explanation we discussed holds true that children initially access the nominal interpretation associated to gradable adjective, because this is a sort of default interpretation. The comparative reading is acquired later. If the parallelism we drew between GAs and SIs is solid, we should observe similar developmental trend in the generation of SIs and the use of the comparative reading of SIs, something that is left open for future research.

# Conclusion

## The contribution of studies on the acquisition of Italian

The contribution of this book is situated within the theoretically oriented approach to the study of language acquisition in the generative tradition, which offers refined tools to interpret developmental paths and to raise questions on the way they manifest themselves, also in different populations. A comparative dimension is directly offered by this perspective, both in cross-linguistic terms and across different modes of acquisition. A particular telling case of the latter type is provided by the non-target productions often found in different populations: despite their superficial similarities, they typically hide different profiles, as revealed by both the quantitative and the qualitative dimension of the various phenomena. The results from Italian that we have reported often share this property. Consider, as an example, the case of clitic production, which has been shown to be challenging for all populations, as it is the case in other Romance languages. However, the challenge does not manifest itself in the same way in different populations, leading to different profiles: whereas young typically developing children undergo an omission stage, which is overcome around age 4, children with SLI have an extended omission stage. Furthermore, as they grow older SLI children still often fail to supply clitics under elicitation. At the older age they react differently though, and tend to produce a lexical noun phrase in place of a clitic. This suggests that the older SLI children have overcome the omission stage. At the older age they do not produce an otherwise ungrammatical sentence in Italian; however, they still cannot master the complexity of the cliticization process. Adult L2 speakers appear to react in a similar way to older SLI children in comparable elicitation conditions, as do early L2 children at the age of 5. The reason for this behavior may be different from that of the SLI population though, and be conditioned, at least in part, by the L1 grammar.

Although children acquiring Italian, as all developing children, undergo stages of non-target consistent productions, these productions are not at random and typically correspond to parametric options, which other languages exploit. We have encountered various cases of this type in the acquisition of Italian. A case in point is found again in the domain of cliticization and the possible interpretation we have entertained of the omission stage in terms of a temporary stage in which children may try out the null-object option, available in several other languages. Another case is the early use of the *si*-causative passive, a construction which is used in a limited way in adult Italian, but which is known to be productive in several other languages, including a closely related one such as French. In contrast, other properties of Italian are easily acquired. This is the case for the core null subject property of Italian, a parameter, which has been

shown to be early set by children from all populations. Null subjects are also properly used and interpreted by young children from early on, in typical and atypical development; in the L2 and bilingual population appropriate use of null subjects in the relevant discourse conditions may partly diverge from that of monolinguals possibly due to cross-linguistic influence. Related to the early setting of the null subject parameter is the equally early acquisition of the articulated inflectional verbal paradigms of Italian. A related manifestation of this early acquisition is the lack of a Root Infinitive/RI stage in early Italian. Also early bilinguals conform to this pattern when they speak Italian. In contrast, they use RIs when they speak German at the age of the RI stage, as do German-speaking children. This type of data from acquisition provides a detailed and special form of language comparison. Inflectional paradigms are also early acquired in the nominal domain in typical development, as is the rapid disappearance of the article omission stage, when Italian is compared to other early languages.

Turning to invariable properties, Italian acquisition data have been crucial in providing evidence for the proper interpretation of principle B errors, which have been found in several other languages, but which are absent in Italian, and more generally in languages with clitics of the Romance type. From early on, the anaphoric interpretation of personal pronouns is discarded in contexts regulated by principle B. On a different domain, data from the acquisition of Italian have shown an early sensitivity to the partition of intransitive verbs in two distinct classes: unaccusatives and intransitives/unergatives. These acquisition data bring strong and original support to the classical unaccusative hypothesis. They have shown that from early on children treat the post-verbal subject of unaccusative verbs in Italian differently from the post-verbal subject of intransitives/unergatives, also detecting the so-called Definiteness Effect in the former case only. A different invariant domain, which we have considered is that of scope interaction: Italian speaking children can compute scope in hierarchical terms rather than linearly, as indicated by the interaction between negation and pre-verbal and focal post-verbal subjects.

Development offers a special opportunity to address the issue of computational complexity. It is natural to assume that computations that are harder to acquire are more complex and thus appear later. Object relative clauses and object *wh*-questions are known to be especially difficult domains of acquisition. Italian is no exception. A robust result from the experiments reported has been the recourse to passive in relatives when an object relative is elicited leading to production of PORs, and similar recourse to passive in object *wh*-questions. As for relatives, different types of PORs have turned out to be better understood by children than object relatives in the active at the age in which children can master passive. This, combined with results from adult controls immediately suggests a measure of complexity whereby the computations leading to passive are less complex than those at play in structures featuring A′-movement. The interpretation we have described in terms of locality/Relativized

Minimality highlights the fruitful contribution of the acquisition data to linguistic theorizing. As mentioned above, children acquiring Italian do not have difficulty in the proper mastery of verbal and nominal inflectional morphology. However, an agreement domain harder to master concerns past participle agreement under cliticization. Again a measure of complexity is indicated by these acquisition data suggesting that the source of the difficulty with past participle agreement is the cliticization process rather than agreement *per se*.

The overview of the results from acquisition studies on Italian offered in this book has provided a picture of the state of the art of the research in this domain. It has also identified a number of further research questions opened by these results throughout the chapters and at the end of each of them. Certainly several other general and specific questions may be raised. We hope that this contribution will be a source of inspiration to move further.

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