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ON THE COMPREHENSION AND THE PRODUCTION OF PASSIVE AND RELATIVE CLAUSES IN A CHILD WITH TEMPORARY HEARING LOSS. A CASE STUDY

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INTRODUCTION

This study originates from my interest in language acquisition. In my BA thesis *"The Acquisition of Syntax: the case of a child with temporary hearing loss"*, I analysed the spontaneous speech of a child with temporary hearing loss: I found that he had a delayed language acquisition although he recovered hearing. During these years, I had the opportunity to meet the child at school and also at his home. I observed that he has improved his language and decided to analyse his comprehension and production of syntactic structures such as relative and passive clauses.

Language is an innate faculty of human beings; animals do not have this ability. To learn a language is natural and spontaneous. The acquisition of language starts in the early years of humans' life and seems to be identical for all children [Guasti, 2007]. This is a process that proceeds step by step. The input that children receive can influence the acquisition of language but it cannot stop it.

The period in which a language can be acquired is called Critical Period. During this period, children acquire language spontaneously and they set the basic properties of language. After this period, it is impossible to acquire a language spontaneously because the ability to learn language is reduced. The input that children receive in this period is crucial. The lack of language experience influences the normal language development. The Critical Period ends around the age of 8 and from this moment, children cannot acquire language as a native language.

Hearing-impaired children are not always exposed to a linguistic input and their language development is often delayed. If children do not receive the correct input, the development of some linguistic properties can change. Indeed, children with hearing impairment have difficulties with some linguistic properties. They have problems in agreement, in the use of verbal morphology, clitic pronouns and complex syntactic structures, as relative and passive clauses. Also children with specific language impairment (SLI) have difficulties with some properties of the language. Differently from hearing-impaired population, SLI children do not follow the normal process of language acquisition although they are exposed to the input since they were born. Like

hearing impaired children, SLI children have difficulties with relative and passive clauses.

Relative and passive sentences are complex structures which they involve changes of different elements in the clause. Their acquisition is the subject of many linguistic studies, and the debate on their acquisition is still open.

The child who I studied had no access to linguistic input until the age of three; indeed, his language development was delayed. The results of a test for children's grammatical comprehension (TCGB) showed that his verbal comprehension was the same as that of 4 year old children. In particular, his main difficulties were concentrated in inflectional, relative and passive clauses. Today he is 9 years old and the results of the TCGB showed that he understands relative and passive clauses. This fact suggests that he has recovered his linguistic delay.

The aim of this study is to verify if he has really recovered his speech delay, investigating the comprehension and the production of relative and passive clauses through specific tasks. Three specific tests are used to assess Stefano's abilities in relative and passive clauses. A quantitative analysis of Stefano's results shows the scores that he obtained in the tasks. A qualitative analysis provides the description of his responses in the comprehension tests and of the strategies that he used to overcome the production of relative and passive clauses. Stefano's results are compared with the results of other groups of children tested in previous studies.

This study includes five chapters organised as follows.

Chapter 1 presents relative clauses and their properties. This chapter aims at providing a description of relative clauses in Italian and of studies on the acquisition and the use of these structures in both typically and atypically developing children.

Chapter 2 sets out a description of passive clauses. In this chapter, the properties of these structures are described. Since the debate on the acquisition of passive sentences is still open, this chapter provides a description of the main studies on this topic. The studies described in this chapter investigate typically developing children. Studies on the acquisition of passive clauses in atypically developing children are scarce.

Chapter 3 presents the participant to the experiment, Stefano, and the findings of my BA thesis. This chapter provides a description of the TCGB test. The investigation will also include the analysis of TCGB scores to obtain a complete linguistic profile of

Stefano. A quantitative analysis compares previous scores to last ones; a qualitative analysis describes the types of mistakes committed by Stefano.

Chapter 4 focuses on the experiments on relative clauses. It describes the control groups, the materials and the results. This chapter includes a quantitative and a qualitative analyses of Stefano's results. The comparison between his results and the ones of the control groups will be presented.

Chapter 5 focuses on passive clauses. It describes the control groups, the materials and the results. It also provides a quantitative and a qualitative analysis of Stefano's results.

CHAPTER 1

ON THE ACQUISITION OF RELATIVE CLAUSES

1.1. Introduction

Children have difficulties in the production and comprehension of relative clauses because of their complexity. The production of these structures starts when children are 2 or 3 years old; the comprehension starts later. These observations have encouraged many studies in different languages. This chapter presents a description of relative clauses in Italian and focuses on their acquisition in typically developing, SLI, and hearing-impaired children.

1.2. Relative Clauses in Italian

Relative clauses (RCs) are subordinate clauses modifying a nominal element, which is called antecedent. This element is the head of the relative clause and can be either the subject or the object in the main clause. The relative clause is introduced by either a relative pronoun (as in 1) or the complementizer *che* (as in 2) [Renzi, Salvi, Cardinaletti (a cura di), 2001: 457-458]:

1) Ho visto il professore [*al quale* vi siete rivolti].
   I saw the professor to whom you have talked to.
2) Questo è il libro [*che* mi hai dato].
   This is the book that you gave me.

Relative clauses are divided in two types [Dardano, Trifone, 1996]: *appositive* and *restrictive* relative clauses. *Appositive* relative clauses add information about an element which is already known: they are adjuncts which are not necessary to understand the clause. *Restrictive* relative clauses modify the antecedent selecting the number of possible referents for it: the antecedent is not already known but depends on the relative clause.

In Italian there are three elements that introduce relative clauses: *cui, (det)+quale,*

che [Renzi, Salvi, Cardinaletti (a cura di), 2001]. These elements occupy the first position in the clause [Lo Duca, Solarino, 2006] but they are not used in the same way in *restrictive* and in *appositive* relative clauses. In *restrictive* relative clauses, the complementizer *che* is used as a pronoun for subjects, objects and for complements which are not preceded by a preposition (as in 3). *Cui* and *(det)-quale* are used as relative pronouns for complements which are preceded by a preposition (as in 4). In this type of relative clauses, *cui* and *(det)+quale* cannot be used to relativize subjects or complements which are not introduced by a preposition. In *appositive* relative clauses, *cui* and *che* are in complementary distribution: in the contexts in which *che* can be used, *cui* cannot be used. In this type of relatives, *(det)+quale* can be used to relativize not only complements with the preposition but also subjects and objects (as in 5). For this reason *(det)+quale* and *che* can be used in the same contexts in appositive relative clauses.

3) Giovanni è il compagno *che* preferisco.

   Giovanni is the classmate who I prefer.

4) La donna *a cui* hai prestato soccorso è mia zia.

   The woman who you helped is my aunt.

5) Marta ha chiesto informazioni a Gianni, *il quale* le ha risposto.

   Marta required some information from Gianni who answered.

Relative clauses can be divided in subject and object relative clauses: in the first type, the relative head is the subject of the relative clause and in the second type it is the object of the relative clause.

This work is focused on subject and object restrictive relative clauses.

1.2.1 Properties of restrictive relative clauses

Subject and object restrictive relative clauses modify the antecedent, which is the head of the RC, and they delimit the number of possible referents for it. Restrictive RCs belong to the syntactic category named CP and are selected by a nominal expression NP.

In Italian, these sentences are introduced by the complementizer *che* (English *that*) and they contain a gap, which marks the initial position of the element that has been relativized. Subject and object relative clauses differ because of the position from which the constituent has moved. In subject relative clauses, the element moves outside the clause from the subject position, whereas it moves from the object position in object RCs. Consider examples (6) and (7) of SR and OR, respectively[1]:

6) La pecora$_i$ [che t$_i$ lava ilcavallo]

   The sheep$_i$[that t$_i$ washes the horse]

7) I gatti$_i$ [che la pecora colpiscet$_i$]

   The cats$_i$ [that the sheep hits t$_i$]

There is a debate about the syntactic derivation of relative clauses. Early researches argue that RCs are derived by the *wh-* movement of a relative operator [Cinque, 1978,1982]. This operator moves from the embedded position, the first merge position, to a higher position in the sentence, namely SpecCP. In this position it is coindexed with the relative head and a chain is created between the two elements. According to these accounts, a subject relative is derived as in (8) and an object relative as in (9):

8)[$_{DP}$ La [$_{NP}$ pecora$_i$ [$_{CP}$ OP$_i$ che [$_{IP}$ t$_i$ lava ilcavallo]]]]

9)[$_{DP}$ I [$_{NP}$gatti$_i$ [$_{CP}$OP$_i$ che [$_{IP}$ la pecora colpiscet$_i$]]]]

According to much recent researches, what moves in SRs and ORs is not the relative operator but the relative head itself [Vergnaud, 1985; Kayne, 1994; Bianchi, 1999]. This theory argues that the relative clause is selected by the head of an external NP, and the relative head, which originates inside the relative clause, raises to the position of SpecCP. According to this hypothesis, SRs and ORs are derived as in (10) and (11), respectively:

10) [$_{DP}$ La [$_{CP}$ [$_{NP}$ pecora$_i$] che [$_{IP}$ [$_{NP}$ t$_i$] lava il cavallo]]]

11) [$_{DP}$ I [$_{CP}$ [$_{NP}$ gatti$_i$] che [$_{IP}$ la pecora colpisce [$_{NP}$ t$_i$]]]]

---

[1]The examples comes from "Test di comprensione delle frasi relative", Volpato (2010).

Relative clauses are constructions that involve *wh-* movement, called also A'-movement. The moved element leaves a trace (t) in the position from which it moves [Chomsky, 1995].

1.2.2 The *pro-drop* parameter

Italian is a *pro-drop* language. It means that the subject of a finite sentence can be phonologically omitted when it can be deduced from the context. The setting of the *pro-drop* parameter gives to the overt subject the possibility to occur either in preverbal or post-verbal position.
Examples:

12) Marco ha telefonato.
   Marco has phoned.

13) Ha telefonato Marco
   Has phoned Marco.

The *pro-drop* parameter allows the embedded subject of RCs to be either in preverbal or post-verbal position, as in (14) and (15):

14) I gatti che la pecora colpisce.
   The cats that the sheep hits.

15) I gatti che colpisce la pecora.
   The cats that hits the sheep. (in English this order is not possible)
   " The cats that the sheep hits"

A consequence for the setting of this parameter on a positive value is that Italian RCs containing a semantically reversible verb, as in (16), may be ambiguous between the subject and object interpretation.

16) La pecora che lava il cavallo.
   The sheep that washes the horse.

Sentence (16) is ambiguous because the subject of the relative clause can be either the sheep or the horse. If the sheep is the subject, the gap of the moved constituent appears in preverbal embedded subject position, as in (17a) ; if the subject is the horse, the gap appears in post-verbal embedded object position, as in (17b).

17) a. La pecora che < la pecora> lava il cavallo.
    The sheep that < the sheep > washes the horse.

    b. La pecora che lava il cavallo < la pecora>.
    The sheep that washes the horse <the sheep>.

If Italian speakers want to disambiguate between the subject and the object interpretation, they can adopt two strategies: a morphological and a syntactic strategy. When both NPs share the same number features, Italian readers can place the subject of the embedded clauses in preverbal position, as in (18). When they find a mismatch number condition, in which one NP is singular and the other is plural, the unambiguous interpretation is allowed by the verbal morphology, as in (19). In Italian, the verb agrees in number with the subject.

18) La pecora che il cavallo lava <la pecora>.
    The sheep that the horse washes <the sheep>.

19) I gatti che colpisce la pecora
    The cats that hits the sheep.

1.3 The Acquisition of Relative Clauses

The acquisition of relative clauses is the topic of many linguistic studies. The production of RCs seems to start when children are 3 years old but the comprehension of these sentences seems to be delayed until the age of 5 [Labelle, 1990; Guasti, 2007].

The first relative clauses which children produce are not restrictive, so they don't specify a particular reference. These first structures are also called pseudo-relatives and the relativized element is always the subject of the subordinate clause [Guasti, 2007]. Children start to produce restrictive RCs later: first subject relative clauses and then

object relative clauses. Although the production of RCs starts early, it differs from adults' production: children's RCs do not display the same characteristics of adults' RCs because some properties settled down after some years [Guasti, 2007]. Guasti and Cardinaletti (2003) show that 5-to-10 years Italian children produce RCs with some peculiarities. First of all, Italian children use resumptive pronouns in RCs, as it was found in other languages.

Example [Guasti, 2007: 191]:

  20) Tocca la zebra che il bambino *la* lava.   (5;3)
       Touch the zebra that the child is washing her.

The second peculiarity is the generalized use of the complementizer *che* instead of relative pronouns such as *a cui* or *di cui*.

Labelle (1990) argue that in children's RCs the relative operator doesn't move, so children don't use relative pronouns because their relative sentences don't require movement. In RCs with resumptive pronouns, the relative head is bound to the resumptive pronoun inside the relative. In RCs without a resumptive pronoun, the relative clause has a null resumptive pronoun [Labelle, 1990].

Guasti and Cardinaletti (2003) propose that RCs produced by children have the same structures as adults' RCs but children always use the null operator because they haven't learned the lexical forms of relative pronouns yet. So the difference between children's and adults' structures is not structural but lexical.

While the production of RCs starts at the age of 3, their comprehension starts later. Early studies argue that children interpret relative clauses as coordinate sentences [Tavakolian, 1981].

Much recent studies show that RCs are comprehended by children but their comprehension is influenced by many elements. The causes of children's difficulties are:

- The number of arguments in the relative clause [Tavakolian, 1982];
- The complexity of the structure;
- The grammatical function of the relative head with respect to the verb of the main clause and the verb of the relative clause.

Relative clauses can have different positions: we can find them at the end of the clause, or inside the main clause, as we can see in (21) and (212) [Guasti, 2007].

21) Il pasticcere guarda il gatto [che sta lavando la capra].
   The confectioner sees the cat [that is washing the goat]

22) Il gatto [che sta lavando la capra] è salito sullo sgabello.
   The cat [that is washing the goat] climbed on the stool

Center embedded clauses as (21) seem to be more complicated than right-branching RCs at the end of the main clause [Guasti, 2007].

The relative head can be either the subject or the object of the main clause and of the relative clause. In example (22) it is the subject of the main clause and also of the relative clause; in (23) it is the subject of main clause but the object of the RC.

23) Il leone[che i coccodrilli stanno toccando] è seduto per terra.
   The lion [that crocodiles are touching] is seated on the gorund.

The relative head could be the object of main clause and the subject or the object of the RC, as in (21) and (24), respectively [Guasti, 2007]:

24) Il pasticcere guarda il leone [che i coccodrilli stanno toccando].
    The confectioner sees the lion [that the crocs are touching].

The results of Ciccarelli's research (1998) show that all relative structures are problematic for 4-years children. At the age of 5, children start to comprehend some of the RCs. In particular, the difficulty is the function of the relative head. Many linguistic studies, which I will present in the next section, show that object relatives are more problematic than subject relative clauses both in comprehension and in production.

1.4 The comprehension of RCs in typical and atypical development across different languages

The acquisition of relative clauses both in comprehension and production is the main topic of many linguistic studies. Many of them find a delay in comprehension of these structures until the age of 5 [Guasti, 2002]. Children's errors in comprehending RCs

were explained in two ways. Tavakolian (1981) argued that children's poor performance is due to the lack of adult's competence: in particular, they cannot use recursive rules required to build embedded clauses such as RCs. Hence, a relative clause is interpreted as a coordinate structure, as we see in (25) [Guasti, 2002].

25) a. The pig bumps into the horse$_i$ [that t$_i$ jumps over the giraffe] (RC)

b. The pig bumps into the horse and --- jumps over the giraffe (coordinate clause)

Goodluck & Tavakolian (1982) and Hamburger & Crain (1982) observed that children produce relative clauses at early stages of language acquisition, so they argued that children's competence is the same as adults and includes recursive rules. These authors attributed children's errors to pragmatic factors and showed that when disturbing factors are removed, the comprehension of RCs improve significantly [Guasti, 2002].

At the same time, results of different studies show a discrepancy between subject and object relatives. ORs are acquired later than SRs, namely at the age of 4-5 [Friedmann, Novogrodsky, 2004; Adani, 2011] and are still difficult at adolescence [Volpato, 2010]. This asymmetry is also found in adult's performance: SRs and ORs are correctly comprehended but ORs need more time to be parsed.

SRs and ORs involve the interpretation of a constituent which is displaced from its original position. They differ from each other as for the position from which movement takes place: in SRs the moved element is the subject of the embedded clause, which means that movement originates in embedded subject position. In ORs the object is moved out of the embedded object position [Friedmann, Belletti, Rizzi, 2009]. Consider the examples (26a) and (26b) of SRs and ORs, respectively [Friedmann, Belletti, Rizzi, 2009]:

26) a. The boy that ___ hugs the monkey (Subject relative)

b. The boy that the monkey hugs ____ (Object relative)

Starting from these knowledge about RCs, many authors have tried to find the reasons of comprehension's difficulties of these structures analysing different population such as typically-developing children, children with specific language

impairment (SLI), hearing-impaired children, and adults.

Many experiments tested the comprehension of restrictive relative clauses with picture selection tasks. Arosio (2005) and Adani (2008) tested three conditions in 5- to 11-year-old and 3- to 7-year-old children, respectively: subject relatives (SR), object relatives with preverbal embedded subject (OR) and object relatives with post-verbal embedded subject (ORp), as in (27), (28) and (29), respectively [Volpato, Adani, 2009].

27) Fammi vedere lo gnomo che <lo gnomo> dipinge i bambini. (SR)
    Show me the dwarf that <the dwarft> is painting the children.

28) Fammi vedere lo gnomo che i bambini dipingono <lo gnomo>. (OR)
    Show me the dwarf that the children are painting <the dwarf>.

29) Fammi vedere lo gnomo che dipingono i bambini <lo gnomo>. (ORp)
    Show me the dwarf that is painting the children <the dwarf>.
    "Show me the dwarf that children are painting <the dwarf>.

Their findings show that SRs are comprehended better than ORs and ORps, which are more problematic than ORs. At the age of three, children are able to comprehend subject relatives and at the age of 4 also object relatives with preverbal embedded subjects. Only at the age of 11, object relatives with post-verbal embedded subjects are comprehended.

Friedmann and Novogrodsky (2004) tested a group of Hebrew-speaking children (mean age 4;7) in the comprehension of subject and object relative clauses. Children's performance was poor on object relatives as opposed to subject relatives, which are correctly interpreted.

All these studies attribute to movement the difficulties with object relatives: in ORs the movement is longer than in SRs. In (26a) we can see that there is not a long distance between the moved element and its original position; in (26b) between the moved element and the original position there are many other elements.

Other authors argue that difficulties derive from the presence of an interfering NP in ORs. The NP appears between the head and its first merge position, so the assignment of the thematic role to the head is problematic [Gibson, 1998; Gordon et al., 2001; Arnon, 2005].

Friedmann, Belletti and Rizzi (2009) claimed that the deficit with object relatives might be selective: ORs in which there is a structural similarity between the moved element and the intervening subject are more difficult. The author associated this selective effect to an extension of Relativized Minimality, a principle introduced by Rizzi (2009).

The Relativized Minimality principle is represented by the following scheme:

X……Z……Y

It claims that a local relation cannot be established between X and Y when an element Z, which is a potential candidate for the local relation, intervenes.

Friedmann, Belletti and Rizzi (2009) tried to verify their hypothesis testing the comprehension of subject and object relative clauses in 22 Hebrew-speaking children aged between3;7 and 5;0, all native speakers of Hebrew with typical development. RCs were tested in two ways: a sentence-picture matching task and a sentence-scenario matching task. The participants were divided into two groups matched for age. The results of the first experiments show that SRs are comprehended by all children (90% of correct responses), while they perform at chance in ORs (55%). Only 7 of the 22 participants perform above chance in ORs. In the second experiment, the authors tested the comprehension of ORs with resumptive pronouns, which are optional in this type of RCs. The results show that headed object relatives with resumptive pronouns are difficult: there are no differences between ORs with and without resumptive pronouns. In the experiments 3 and 4, free relatives and relatives with impersonal *pro* subject were tested. In free relatives, the moved element is a *wh-* operator, an operator which has no lexical NP features. Results of both experiments show that free ORs and ORs with impersonal *pro* subject are well comprehended and the asymmetry between SRs and ORs disappears. These findings confirm the hypothesis that the deficit with ORs is selective. Children have difficulties in ORs when the moved element and the intervener contain the same features.

Adani, van der Lely, Forgiarini and Guasti (2010) tested three groups of Italian-speaking children age 5, 7 and 9 in the comprehension of center-embedded object relative clauses in which number and gender features were manipulated. Authors argue that NP-internal features such as Number or Gender modulate the difficulty with ORs. The experiment tested both the number match condition, as in (30), and the number

mismatch condition, as in (31) [Adani, van der Lely, Forgiarini, Guasti, 2010].

30) a. Il leone che il gatto sta toccando è seduto per terra.

The lion-SG that the cat-SG is touching is sitting-SG.

b. I coccodrilli che i cammelli stanno toccando sono seduti per terra.

The crocs-PL that the camels-PL are touching are sitting-PL.

31) a. Il leone che i coccodrilli stanno toccando è seduto per terra.

The lion-SG that the crocs-PL are touching is sitting-SG

b. I coccodrilli che il leone sta toccando sono seduti per terra

The crocs-PL that the lion-SG is touching is sitting-PL.

The results showed that Number conditions are more accurate than Gender ones. In particular, Mismatch conditions are more accurate than Match ones. The authors conclude that Number features of NPs modulate the comprehension of ORs.

Object relatives are problematic also for children with atypical development, such as SLI or hearing-impaired children.

Friedmann and Novogrodsky (2007) tested the comprehension of object relatives in two groups of Hebrew-speaking children: one of 16 SLI-children and one of 50 children with unimpaired language development. Difficulties in ORs are ascribed to a deficit in syntactic movement: this experiment intends to verify if the problem is the construction of the syntactic structure and the trace or the transfer of thematic roles from the trace to the head of the relative clause. The analysis showed that object relatives are more difficult than simple sentences and the general performance was poorer for the SLI-children than for the control group. SLI-children failed in thematic role assignment and their errors include [Friedmann, Novogrodsky, 2007]:

- "Reversal of thematic roles in the relative clauses";
- "Ascribing the predicate of the main clause to the subject of the relative clause";

- "A mix of thematic role reversal in the relative clause and ascribing the main verb to the argument of the relative clause";
- " Ascribing the main verb to the argument of the relative while

ignoring the subject of the main clause";

-   " Ascribing the main verb to the argument of the relative while not assigning to the subject of the main clause a role";

-   "Deletion of the relativizer *that/who* that change the array of thematic roles in the sentences".

The authors claimed that the difficulties of SLI-children with ORs can be ascribed to the incorrect assignment of thematic roles rather than the inability to construct the structure of relative clauses.

Adani, Guasti, Forgiarini, van der Lely (2009) studied the comprehension of RCs in a group of SLI-children (age 9;5 – 16;0) and in a group with unimpaired language development (age 6;0 – 8;11). They tested SRs and ORs in Match and Mismatch conditions: in the first condition, the NPs are all singular or plural; in the second condition, one NP is singular and the other is plural or viceversa. The authors predicted that subject relative clauses are comprehended better than object ones and the Number feature helps the comprehension of RCs in both groups. The results confirm the authors' predictions and show that SLI-children are less accurate than children without SLI. SRs are comprehended better than ORs by SLI-children; the Number feature helps them comprehending these clauses. Adani, Guasti, Forgiarini and van der Lely (2009) conclude that Relativized Minimality explains the difficulties with ORs but when the NPs contain different Number features, the comprehension of these clauses is facilitated.

Similar studies were conducted on normal hearing and hearing impaired children and their results confirmed that ORs are more problematic than SRs [Friedmann, Stzermann, 2006; Volpato, Adani, 2009; Volpato, 2010; Friedmann, Stzermann, Haddad, 2010].

Friedmann and Stzermann (2006) tested RCs in 20 hearing impaired children (mean age 7;9). The children had normal-hearing parents and they spoke Hebrew because of the oral education. The authors argue that the interpretation of RCs depends on different operations:

-   the assumption of the trace
-   the assignment of a theta-role to the trace

- the creation of a chain to transfer the theta-role from the trace to the moved DP.

If the deficit damages one of these operations, it can be difficult to assign the role of agent or patient to the NPs. The hypothesis by Friedmann and Stzermann was that the deficit is the same for SLI, hearing impaired children, and people with aphasia. The results showed that SRs are comprehended better than ORs in both groups which were tested. Hearing-impaired children were less accurate than normal hearing ones. ORs with resumptive pronouns were comprehended better than ORs without them. These findings suggest that hearing impaired children have difficulties with the movement of the NPs and ORs with resumptive pronouns are easier than ORs without them because they don't need movement. The authors' hypothesis was however not confirmed: the deficit has a different origin in SLI, hearing impaired children, and aphasic people. As Friedmann and Stzermann claimed, deaf children have difficulties with sentences derived by movement but SLI children cannot assign thematic roles to the arguments [Friedmann, Novogrodky, 2007]. For people with aphasia, the deficit can be ascribed to the CP, which is inaccessible for them. The same findings were found by Friedmann, Stzermann and Haddad (2010) in a research on the comprehension of sentences derived by *wh-* movement, among which relative clauses. They tested a group of Hebrew deaf children (aged 9;1-12;3) and a group of Palestinian Arabic deaf people (aged 9;0 – 21;0). The comprehension of object relative clauses was problematic in both groups. The authors also tested wh-interrogatives and found that object interrogatives were less accurate than subject ones, similarly to what happens with subject and object relative clauses. This fact showed that the deficit could be ascribed to movement, as was claimed by Friedmann and Stzermann (2006).

Volpato and Adani (2009) claimed that the deficit with ORs in hearing impaired children depends on subject-verb agreement. To verify their hypothesis, they tested a group of 8 deaf children with cochlear implant (CI) and three groups of children with unimpaired language development. The results showed that the performance of children with CI was less accurate than the one of the control groups but all groups performed better in SRs than in ORs. The authors also observed that ORs with preverbal subjects were comprehended better than ORs with postverbal subjects (ORp). The asymmetry between SRs and ORs can be explained with Relativized Minimality [Rizzi, 2009] but

this principle cannot be used to understand the discrepancy between ORs and ORp. Object relative clauses with post-verbal subject involve a long chain between the expletive NP and the post- verbal subject [Volpato, 2010]. Like the preverbal embedded subject in ORs, the preverbal *pro* intervenes between the relative head and the post-verbal NP. Adopting the Relativized Minimality principle, we would expect that preverbal *pro* might cause the same intervention caused by the preverbal embedded subject in ORs. Hence, the performance with ORp and ORs must be similar. On the contrary children have more difficulties with ORp than ORs. Volpato and Adani (2009) explained this result assuming that in ORs, subject-verb agreement is checked twice: under AGREE [Chomsky, 1995, 2000, 2001] and in the Spec-Head configuration, as shown in (32a). Subject verb agreement is robust because it involves both AGREE and Spec-Head checking [Volpato, 2010]. In ORp, only AGREE is established between the verb and the subject in post-verbal position, as in (32b).

32) a.

CP
Object
C'
C   IP
Subject   → Spec.Head
I'
I   VP
Agree ←   ~~Subject~~
V
V   ~~Object~~
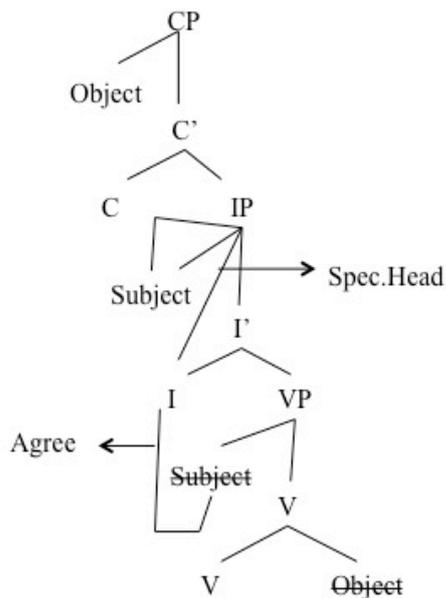
32) b.
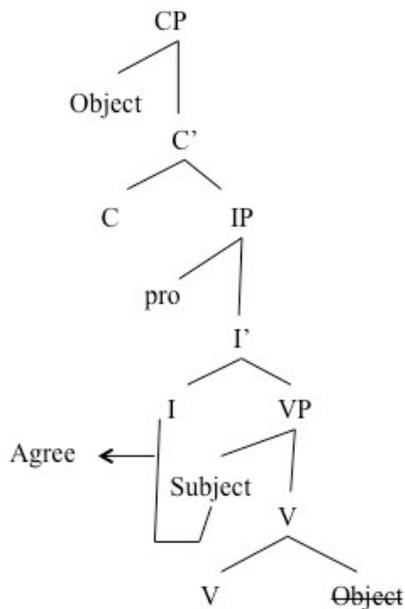
Volpato and Adani (2009) claimed that the participants to the experiment have difficulties with ORps because of their fragility in agreement between verbs and post-verbal subjects; this is the cause of the deficit observed in hearing impaired children.

Volpato (2010) found the same results as Volpato and Adani (2009) studying a group of hearing impaired children with cochlear implant (CI) and a group of normal hearing children. Analysing the participants' errors, she noticed that they interpret ORps as subject relative clauses because of the fragile agreement in ORps. In hearing-impaired children, this interpretation is more common because they get instructed to SVO structures. Moreover, keeping in memory the verbal morphology up to the post-verbal subject is difficult for them. The author also tested the comprehension of relative clauses in Match and Mismatch conditions. The results showed that Number features help the comprehension of ORs in normal hearing children, as Adani et al. (2009) claimed, but hearing impaired children are not sensible to Number features.

1.5 The production of RCs in typical and atypical development across different languages

The production of relative clauses starts earlier than their comprehension. Researches on children's spontaneous speech and elicited production experiments show that children produce relative clauses from the age of three [Guasti, 2007]. These studies confirmed the subject/object asymmetry also in production: children performed well on subject relative clauses and they had difficulties with object relative clauses. Children's production of RCs was the topic of many studies across languages and in different populations, such as typically developing, SLI and hearing impaired children.

Labelle (1990) found that early relative clauses produced by children are different from the ones produced by adults. She interviewed a group of French-speaking children aged 3- to 6-year old. The author investigated different kinds of relatives: subject, direct object, indirect object, locative and genitive. The results of this investigation show a massive use of resumptive pronouns: this strategy was used in all types of relatives. McDaniel, Mckee and Bernstein (1998) found that English-speaking children aged 3- to 6-year old produced relative clauses like adults most of the time [Guasti, 2002].

Guasti and Cardinaletti (2003) studied the production of different types of relative clauses: subject relatives, direct object relatives, indirect object relatives, locative relatives and genitive relatives. They tested a group of Italian-speaking children aged 5;1 - 10 and a group of French-speaking children aged 4;5 – 7;3. The authors observed that SRs and ORs were correctly produced by children: children's SRs and direct ORs contained the correct complementizer and they rarely contained a resumptive pronoun. Interestingly, children adopted a strategy attested mostly in adults' production of ORs: they used to transform the ORs in SRs by passivizing the verb, as in (33).

33) Tocca il cammello che è stato comprato dal bambino (9;3)
    Touch the camel that has been bought by the child.
    TARGET: Tocca il cammello che il bambino ha comprato.
            Touch the camel that the child has bought.

Utzeri (2007) analysed the elicited production of a group of Italian-speaking children aged 6 -11 and compared it with the elicited production of a group of Italian-speaking

adults. The results showed that both children and adults avoided the production of ORs. Moreover, children produced 22% of elicited ORs, while adults produced less than 1% of ORs. Both children and adults tend to turn ORs into SRs by passivizing the verb as in (34) [Utzeri, 2007: 293].

34) TARGET: il bambino che la mamma copre.

The child that the mother wraps up.

ANSWER: il bambino che è coperto dalla mamma.

The child that is wrapped by the mother.

While adults use passivization systematically, this is the prominent strategy in children but they also use other strategies such as passive causative constructions (as in 35), "receive+ NP (as in 36) and change of the target verb (as in 37).

35) TARGET: Il bambino che il re pettina.

The child that the king combs.

ANSWER: Il bambino che si fa pettinare dal re.

The child that himself makes comb by the king.

"The child that makes himself comb by the king."

36) TARGET: Il bambino che la mamma bacia.

The child that the mother kisses.

ANSWER: Il bambino che riceve un bacio dalla mamma.

The child that receives a kiss by the mother.

37) TARGET: Il bambino che il nonno ascolta.

The child that the granddad listens.

ANSWER: Il bambino che legge al nonno.

The child that reads to the granddad.

Children avoid object relativization cross-linguistically: the tendency to produce SRs instead of ORs is attested in different languages. The same result is reported in Italian and French [Guasti, Cardinaletti, 2003; Labelle, 1990], English [see McDaniel, Mckee, Berstein, 1998] and Spanish [see Ferreiro, Othenin-Girard, Chipman and Sinclair, 1976]. From these findings Utzeri (2007) concluded that "the tendency to turn ORCs

into SRCs by passivizing the verb is attested in the early systems of different languages".

Comparing the performance of Italian-speaking children with adolescents and adults, Volpato (2010) found that the production of SRs has high percentages in all groups. Opposite to SRs, ORs were avoided by adolescents and adults, who turn them into SRs passivizing the verb. She observed that children produce ORs with resumptive pronouns.

Contemori and Belletti (2013) tested the production of passive ORs (PORs) and the comprehension of active ORs and PORs, showing that in the latter participants are more accurate than in the former. The participants were a group of Italian-speaking children aged 3;4 – 8;10 and a group of control composed by ten adults. Results showed that ORs were produced in very few cases by adults, who prefer to produce PORs. Also older children preferred PORs to ORs. Younger children adopted different strategies to avoid ORs such as Declarative sentences, ORs with non- target verb agreement, ORs with resumptive pronouns. Contemori and Belletti (2013) observed that PORs is the preferred strategy adopted by adults and this type of clauses emerges around the age of 5 with a drastically increase in 8-years-old children.

Studies on SLI and hearing impaired children showed similar findings [Hakansson, Hansson, 2000; Friedmann, Sztermann, 2006; Friedmann, Novogrodsky, 2006; Volpato, 2010; Volpato, Vernice, 2014].

Hakansson and Hansson (2000) investigated the relationship between the comprehension and the production of RCs in Swedish children. They tested children with specific language impairment aged 4;0 to 6;3 and children with unimpaired language development aged 3;1 to 3;7. This study was longitudinal: children were tested twice with an interval of six months. Unimpaired children had no difficulties in the production and comprehension of relative clauses: the first results showed no differences between the two modalities. After six months, they performed better on production than on comprehension. Indeed, the authors claimed that Swedish children start using RCs at the age of 2; at the age of 4, production seems to have developed faster than comprehension. SLI children always performed better in comprehension than in production and their results showed they have difficulties with RCs. These subordinate clauses do not seem to be acquired by SLI children until the age of 4 and

their deficit could be ascribed to the complementizer. Hakansson and Hansson (2000) claimed that the complementizer in Swedish is a clinical marker of SLI.

Hebrew-speaking children with normal development also have no difficulties with the production of subject and object relatives, as was found by Friedmann and Novogrodsky (2006). On the contrary Hebrew-speaking children with SLI produced fewer subject and object relatives than typically developing children and avoided the production of ORs using simple sentences, sentence fragments, or adjectival passives[2].

Another important study was the one conducted by Friedmann and Sztermann (2006). They tested the comprehension and the production of RCs in hearing impaired children. They showed that unimpaired children performed better than hearing impaired children in both subject and object relatives. Hearing impaired children have no difficulties with SRs but ORs are problematic for them. They avoided the production of ORs using different strategies:

- Turning ORs into SRs;
- Producing simple sentences;
- Using resumptive pronouns;
- Repeating the subject DP

Friedmann and Stzermann (2006) ascribed the deficit to movement and noticed that resumptive pronouns help impaired children to build these structures.

Volpato (2010) investigated the production of subject and object relative clauses in normal hearing and hearing impaired children with cochlear implant. The results confirmed the asymmetry between subject and object clauses. In SRs hearing-impaired children were less accurate than unimpaired children but the difference was not significant. Both groups of children produced less ORs than SRs. Normal hearing children produced more ORs than hearing impaired children but both groups preferred to avoid these sentences adopting different strategies [Volpato, 2010]. The most used strategy was the passivization of the verb (as in 38) but children also turned ORs into SRs using the causative construction (*farsi +verbo* "to make oneself + verb) as shown in (39).

---

[2] Hebrew-speaking children with SLI did not use passive sentences instead of ORs presumably because passives are very rare in Hebrew [Friedmann, Novogrodsky, 2006].

38) TARGET: Mi piace il bambino che il papà lava.

I like the child that the father washes.

ANSWER: Mi piace il bambino che è lavato dal papà.

I like the child that is washed by the father.

39) TARGET: Mi piace il bambino che il papa pettina.

I like the child that the father combs

ANSWER: Mi piace il bambino che si fa pettinare dal papà.

I like the child that himself make comb by his father.

"I like the child that make himself comb by the father."

As for passivization, the pattern of performance is reversed: hearing-impaired children used this strategy more frequently than normal hearing children. On the contrary, the causative structure is more frequent in the unimpaired groups. Hearing-impaired children also used to replace the complementizer *che* with a *wh-* element, like *dove* ("where"). This strategy is not adopted by normal hearing children, who frequently transformed ORs into SRs by turning the embedded subject into the relative head, as in (40).

40) TARGET: I bambini che il papà pettina.

The children that the father combs.

ANSWER: il papà che pettina i bambini.

The father that combs the children.

These strategies were also attested by Volpato and Vernice (2014), who compared the production of hearing-impaired children with cochlear implant to that of three groups of normal hearing children. The authors confirmed the asymmetry between subject and object relatives in all groups but they noticed that SRs are more problematic in hearing-impaired children than in unimpaired children, although percentages are high. The NP which is the relative head is the subject or the object of the main clause and also of the relative clause, so it receives a theta-role from the verb of the main clause and one from the verb of the relative clause. Volpato and Vernice (2014) ascribed the results of their experiment to the difficulties in the computation of a NP with respect to two verbs. The authors observed that the different strategies used by

children are based on their linguistic maturation and on the different tools which are offered by their language.

1.6 Discussion

Relative clauses are subordinate clauses that involve movement of an element out of them. For this reason, they are acquired later than simple sentences, and their acquisition is problematic.

Different researches have investigated the comprehension and production of relative clauses, which can be divided into subject and object relatives. In subject relative clauses (SRs), the embedded subject is moved out of the subject position of the relative clause; in object relative clauses (ORs) the moved element is the embedded object.

The most important finding of previous researches is the asymmetry between SRs and ORs both in comprehension and production. This discrepancy is attested in normal developing, SLI, and hearing-impaired children. Object relative clauses seem to be more problematic than SRs also for adolescents and adults. These structures require more time to be parsed in comprehension and in production. Adults have the tendency to avoid object relatives using passivization: the studies described in the preceding sections showed that adults produce less ORs than children but they use passive relatives. While the difficulties disappear in normal developing children when they grow up, they persist in atypically developing children. The deficit seems to have different origins in hearing-impaired and SLI children. While for deaf children, it is ascribed to the movement operation itself, in SLI-children it seems to be caused by the inability to assign a thematic role to the moved element.

The studies described in this chapter showed a typical gradient of difficulty for all children: subject relative clauses are easier than object relatives with embedded subject, which are easier to interpret than object relatives with post-verbal subject. Many approaches tried to explain this phenomenon.

1.6.1 The Minimal Chain Principle

De Vincenzi (1991) tried to explain the asymmetry between subject and object relative clauses through the Minimal Chain Principle (MCP). According to this principle, the speaker/hearer tries to build the shortest chain between the moved element and its trace placing a gap as soon as possible. In subject relatives, the gap is in the embedded subject position, therefore the distance between the moved element and the trace is short, as shown by the example (41). In object relatives, the distance is long because the gap is in the embedded subject position and another element intervenes between the moved element and the trace, as shown in (42) [Volpato, Adani, 2009]. Arnon (2005) observed that the difficulties in these structures increase because of the intervening element.

41) Indica il cavallo che <e> sta inseguendo i leoni. (Short Chain <headDP, e>)
    Show the horse that <e> is chasing the lions.

42) Indica il cavallo che i leoni stanno inseguendo <e>. (Long Chain <headDP,<e>)
    Show the horse that the lions are chasing <e>.

The MCP predicts that short dependencies are easier to be parsed: it means that subject relatives are easier than object ones.

De Vincenzi's principle also explains the difficulties with object relatives with post-verbal subject in Italian. In these sentences the trace of the moved element is placed in the embedded post-verbal object position as in example (43).

43) Indica il cavallo che <pro_i> stanno inseguendo i leoni$_i$ <e>.
    Show the horse that <pro_i> are chasing the lions$_i$ <e>.
    "Show the horse that the lions are chasing."

In (43), we can observe that two distinct chains are involved: the first between the *pro_i* in embedded subject position and the subject, *i leoni$_i$,* in post-verbal embedded position. The second relation is established between the moved object and its trace. De Vincenzi (1991) assumed that the computation of two distinct relations in the same sentence is more difficult than the parsing of one relation for children: for this reason

object relatives with post-verbal subjects are more problematic than object relatives with preverbal subjects.

1.6.2 Relativized Minimality

As De Vincenzi (1991), Friedmann, Belletti and Rizzi (2009) tried to understand why children avoid object relative clauses. They hypothesized Relativized Minimality (RM), which is a principle of locality, which claims that a local relation cannot be establish between X and Y, when an intervener Z has the same features of X and Y, so it is a candidate for the local relation:

…X…Z…Y…

In subject relative clauses, there is no potential intervener between the moved element and its trace, therefore the RM is not at play. This fact is confirmed by results of different studies [Belletti, Rizzi, 2009; Volpato, Adani, 2009] showing a high percentage of correct responses in subject relatives. In object relatives, an intervening elements is placed between the moved object and its trace: children fail in assigning the correct thematic role to elements with the same morpho-syntactic features. It means that children are not able to interpret the relation between the head of OR and its trace when a lexical NP intervenes between the two positions.

Even though Relativized Minimality explains the asymmetry between subject and object relatives, it fails in providing an explanation for the different results in object relatives with preverbal subjects (OR) and with post-verbal subjects (ORp) . The latter sentences involve a long chain between the expletive *pro* and the post-verbal subject; moreover, they also need a chain between the moved object and its trace. The expletive *pro* seems to cause the same intervention effect as those provoked by the preverbal subject. On the basis of RM, the performances in object relative with preverbal embedded subject and in those with post-verbal subject should be similar. On the contrary, the results of Volpato and Adani (2009) showed that OR are easier than ORp.

1.6.3 The theory of Agreement

Guasti and Rizzi (2002) and Frank (2006) adopted the minimalist theory of agreement [Chomsky, 1995, 2000, 2001] to explain the asymmetry between object relatives with preverbal subjects (OR) and object relatives with post-verbal subjects (ORp).

According to this theory, in OR agreement is checked twice: it occurs under AGREE and Spec-Head configurations. Subject-verb agreement is robust because its derivation involves AGREE and Spec-Head checking. In ORp, subject-verb agreement is checked only under AGREE and causes the formation of a long-chain between the verb and the subject in post-verbal position.

As Guasti and Rizzi (2002) and Frank (2006), Volpato and Adani (2009) attributed the difficulties in OOp to the fragility of agreement between the verb and the post-verbal subject. The authors claimed that this phenomenon is found in early children grammar but it is more evident in hearing-impaired children.

1.6.4 The theory of Smuggling

As different studied demonstrated [see paragraph 1.5], adults avoid the production of relative clauses: they tend to transform object relatives (OR) into passive object relative clauses (POR). The passivization is an adults' strategy also used by older children.

In PORs there is not an intervening element between the moved object and its trace: for this reason they seem to be easier to parse.

To explain the use of passive object relatives, many authors adopted the theory of Smuggling (Collins, 2005). According to Collins, a smuggling operation occurs within the VP projection to avoid Minimality effect. The smuggling of the VP allows the movement of the object to a higher position that is the Spec of the Voice Phrase (VoiceP). The head of VoiceP is the preposition *da* ("by). From this position the object can move to Spec.IP. According to this theory shorter movements are easier to be parsed than long movements. Since ORs require a long movement, PORs are preferred by adults and children.

CHAPTER 2
PASSIVE CLAUSES

2.1 Introduction

Passive clauses have a complex structure with a marked word order. For this reason, they are comprehended and produced late by children. Many studies investigated the acquisition of passive sentences in normal hearing children. Unlike relative clauses, few researches study the acquisition of these structures in hearing-impaired and SLI children.

This chapter is focused on the description of passive structures, in order to show their complexity, and on their acquisition.

2.2 Passive structures

In human languages, active and passive structures can be distinguished. The latter seem to be more difficult to be parsed than the former.

Chomsky (1965) observed that an active sentence does not always have the same meaning as the passive counterpart: it means that active sentences are not always the equivalent of the passive ones. Chomsky (1965) explained it observing sentences in which numerals or quantifiers are used in generic statements as in the following examples [Chomsky, 1965: 224].

1) Everyone in the room speaks two languages

2) Two languages are spoken by everyone in the room.

(2) is the passive structure of (1) but they are not synonymous. The sentence in (1) is referred to any two languages per person. The sentence in (2) is referred to two specific languages spoken by everyone in the room.

In active sentences, the subject of the action receives the thematic role of agent, which is attributed to the doer of the action. The object can be the patient or the receiver

of the action. Passivization implies a reorganisation of the grammatical functions of the active sentences. In passive clauses, the patient becomes the subject of the clause, and the agent can remain unexpressed or can be expressed by a prepositional phrase (PP) introduced by the preposition *da* (*by* in English) [see Haegaman, 1996].

Example of active and passive clauses are provided in (3) and (4), respectively[3]:

3) Sara spinge Marco.　　　(Active clause)
　　Sara pushes Marco.

4) Marco è spinto (da Sara).　　　(Passive clause)
　　Marco is pushed (by Sara).

In the active clause (3), *Sara,* who is the agent, performs the action described by the verb and *Marco*, the patient, is subjected to the action. The agent occupies the subject position and the patient occupies the object position. In the passive clause (4), *Marco* occupies the subject position but it receives the same theta-role by the verb: it is the patient. In (4), the agent is not in its canonical position.

In English, passive clauses can be distinguished in two types: *adjectival* and *verbal* passives. In 1977, Wasov suggested that *verbal* passives, called also *eventive* passives, are derived by syntactic transformations and are used to indicate processes. *Lexical processes* derive *adjectival* or *stative passives*, which describe states. The lexical process involves the elimination of the thematic role assigned to the external argument, which is directly projected into the subject position: in this structure, the argument is generated in subject position. Like English, also Italian can distinguish these types of passives.

The distinction between *adjectival* and *verbal* passives makes some clauses ambiguous, as example (5) shows [Guasti, 2002: 248].

5) The door is closed.

The sentence in (5) is ambiguous because "closed" can be either a verb or an adjective. Under a stative reading, it describes the state of the door; under the eventive reading, it describes the event of closing the door. The *by*-phrase can disambiguate the

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3 The examples comes from the "Test di comprensione della frasi passive" by Verin (2010). They will be used as our experimental material.

clause in (5) but also the use of *to get* in English can help the interpretation of the clause as we see in the following example [Guasti, 2002].

      6) a. The door is closed by Marco.

        b. The door get closed.

In many languages, as English and Italian, *adjectival* and *verbal* passives have the same morphology. On the contrary, in other languages such as Hebrew, Spanish or German *adjectival* passives are morphologically distinct from *verbal* passives, therefore they are not ambiguous [Guasti, 2002]. In Hebrew adjectival passives don't take the tense marker, which is expressed on the copular verb *haya* ("essere/to be"). Hebrew *verbal* passives are inflected for tense and agreement; unlike *adjectival* passive, they allow the *by*-phrase [Guasti, 2002]. In Spanish, verbal passives are introduced by a verb that corresponds to Italian *venire* ("to come") and adjectival ones are expressed by a verb, which corresponds to Italian *essere* ("to be"). German uses *sein* ("essere/to be") for the *stative* passive clauses and *werden* ("diventare/to get") for *eventive* ones.

Passive sentences can be *reversible* or *irreversible*. In reversible clauses, the subject can be exchanged with the agent expressed in the by-phrase: in this case the meaning of the clause changes providing the opposite meaning. The sentence is grammatical although the arguments are reversed. On the contrary irreversible passive clauses don't allow the reversal of the agent with the subject [Chilosi, Cipriani, 2006]. In the following example reversible and irreversible are shown.

      7) La porta è chiusa da Marco.   (irreversible)

        The door is closed by Marco.

        *Marco è chiuso dalla porta.

        * Marco is closed by the door.

      8) Marco è spinto da Sara.   (reversible)

        Marco is pushed by Sara.

        Sara è spinta da Marco.

        Sara is pushed by Marco.

A movement, called A-movement, is involved in the construction of passive sentences: in this movement the object NP moves to the A-position, which is SpecIP. The subject normally occupies this position. In SpecIP the moved object triggers agreement with the verb. The object, which is the internal argument, leaves a coindexed trace in its original position: through this trace it can receive its thematic role. The result of this movement is an A-chain (argument chain) [Haegeman, 1996]. This movement is shown in (9), which represents the syntactic structure of the sentence in (8).

9)
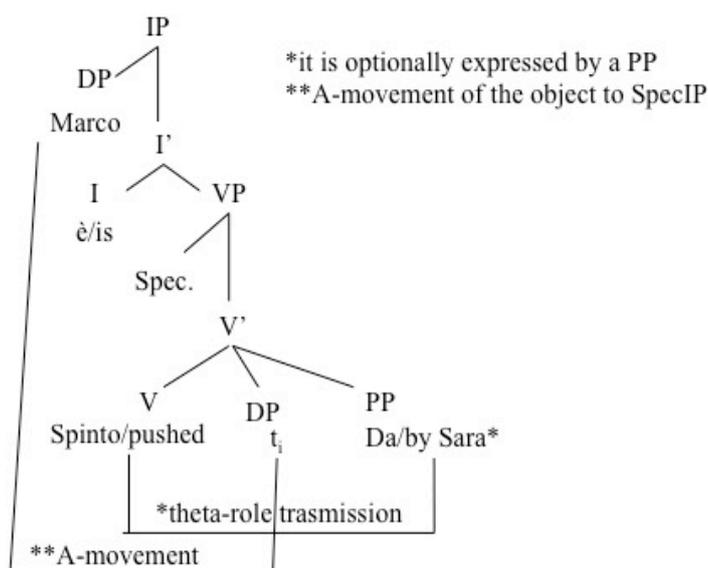
The external argument, the subject of the active clause, need not to be expressed. The thematic role of external argument is realised by passive morpheme *–to* in Italian and *–ed/-en* in English. The passive morpheme is attached directly to the verb. This fact implies that it is not necessary to assign this thematic role to another NP. If the agent is expressed, it is realized through an added prepositional phrase (PP) [Haegeman, 1996; Guasti, 2002].

In summary, passive constructions involve three steps:

- A-movement of the object to SpecIP;
- Assignment of the thematic role of external argument to the passive morpheme. This operation is called theta-role absorption;

- Optional transmission of the thematic role, assigned to the passive morpheme, to the NP through a PP, the *by*-phrase.

Jaeggli (1986) proposed that the passive verb absorbs the external theta-role of the verb and it is prevented from assigning the objective Case: the subject doesn't receive the role of external argument because it absorbed by the passive morpheme. The passive suffix has an important property, called "Theta-role absorption": this suffix can absorb the external theta-role assigned by the verb because it is affixed to the verb. The consequence of assigning the external thematic role to this suffix is that this role cannot be assigned to another NP: it means it cannot be assigned to its regular position [Jaeggli, 1986]. Jaeggli (1986) confirmed that passive suffix is an argument that receive the external role showing the differences between the following example [Jaeggli, 1986: 591]:

10) It kills the rat.
11) The rat was killed.

In (10) there is not a suffix and the external argument must be assigned to an NP; on the contrary, in (11) the external theta-role is absorbed by the passive suffix *–ed*.

So, Jaeggli (1986) concluded that passive structures involve case-absorption by the passive morpheme.

Jaeggli's theory was rejected by Collins (2005), who proposed that the theta-role of external argument is assigned in the same way it is assigned in active sentences. According to Collins (2005) the external argument enters the same thematic relationship to the verb in both active and passive clauses. Collins' theory is known as Theory of Smuggling: passive constructions are derived not from one movement but from more derivational steps. Collins (2005) discussed the fact that Relativized Minimality, which intervenes between elements with same features, blocks the movement of the internal argument over the external argument. Smuggling is an operation that avoids the Minimality effect [Collins, 2005]. According to this theory, the derivation of passive sentences involves two steps:

- Movement of the full VP, composed by the verb and the object, to a position higher than that of the subject. The VP moves to smuggle the subject in

SpecVP. Through this operation, the object can cross over the external argument in the SpecVoiceP, which is a projection whose head is the preposition *by*, as in (12).

- Movement of the object to the SpecIP. From VoiceP, the object can move to an higher position, which is SpecIP. This operation is shown in (13).

12)
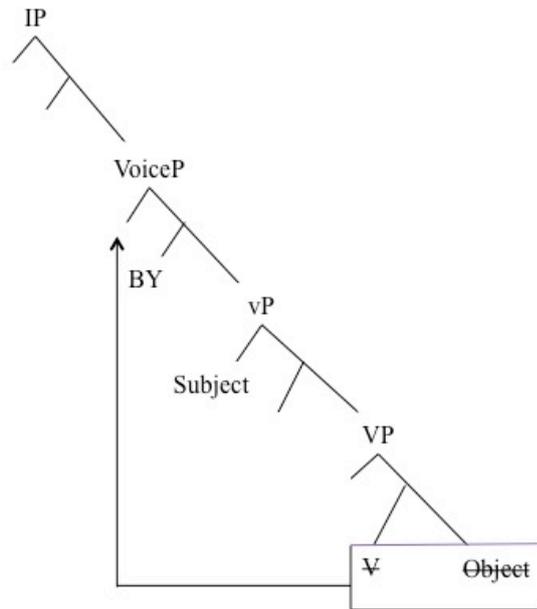
13)
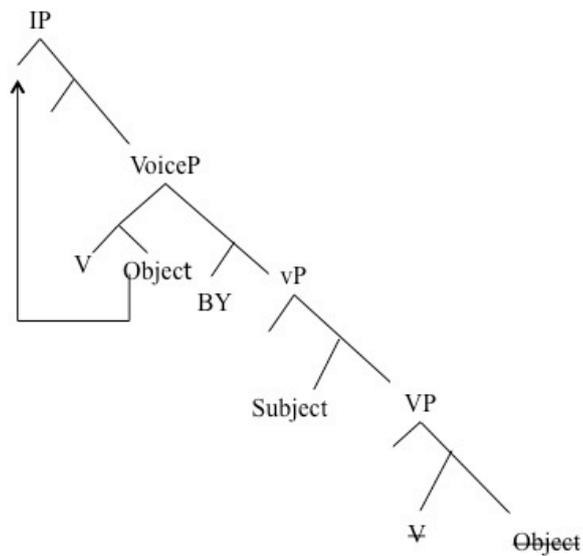
Collins (2005) claimed that smuggling is the most economic solution to derive these structures because it eliminates the intervening effect and allows local relations. Children have access to smuggling mechanism later, so more local steps can be problematic for them [Collins, 2005]. Volpato (2010) showed that adults prefer local and short relations.

2.3 Passive clauses in Italian

Italian passive clauses are formed as the English passives. They have a subject, an auxiliary verb associated to the past participle of the lexical verb. The agent can be optionally introduced as a prepositional phrase (PP) introduced by the preposition *da* ("by"). The insertion of the *by*-phrase is not compulsory but it depends on the context and on what the speaker wants to underline [Haegeman, 1996; Guasti, 2002].

In English, there is another way to form passive clauses: the auxiliary *to be* ("essere") can be substituted by *to get* with the past participle of the lexical verb. In Italian the use of the auxiliary *essere* ("to be") is the most common but the verb *venire* ("to come") can be used to build passive structures, as the English *to get* [Celce-Murcia et al.,1983].

In the preceding section, two types of passive clauses are described: *adjectival* and *verbal* passive clauses. As English, also Italian distinguishes between these two types of passives. Also in Italian some passive clauses, as in (14), can be ambiguous.

14) La porta è chiusa
    The door is closed.

The sentence in (14) can be ambiguous because *chiusa* can be either an adjective or a verb. As in English, the by-phrase and the verb *venire* ("to come") can disambiguate the sentence in (14), as in the following examples.

15) La porta è chiusa da Marco.
    The door is closed by Marco.

16) La porta viene chiusa (da Marco).

The door comes closed.

"The door is being closed".

The examples (14), (15) and (16) show that adjectival and verbal passive are homophones in Italian, as in English, but the *by*-phrase and the verb *venire* suggest the eventive interpretation.

As in other languages, in Italian passive sentences can be *reversible* or *irreversible* [see section 2.2].

Italian is a pro-drop language [as we saw in chapter 1] and allows post-verbal subjects. It means that in passive clauses, the subject can follow the verb, as in the following example [Guasti, 2007:198].

17) E' stato pettinato Aladino.

Is been combed Aladino.

" Aladino has been combed."

In other languages, post-verbal subjects are not admitted, e.g. English.

2.4 The acquisition of passive clauses

Passive clauses are problematic for children because they require a reorganization of the clause: the argument structure and the verbal morphology change. Moreover, they are expressed through an auxiliary and the past participle of the lexical verb.

Many studies investigated the acquisition of passive sentences but the debate is not concluded. The acquisition of these structures seems to start late. Various researches (Maratsos et al., 1985; Borer and Wexler, 1987) claimed that children acquire passive constructions around the age of 5;0 – 7;0. These early studies attributed this fact to language immaturity and to the fact that children cannot access to the transformational mechanisms required to derive passive sentences. These studies claim that children have difficulties in the comprehension and production of passive sentences.

Horgan (1978) observed that children aged 2;0 - 3;0 produce mainly *stative* passives, which describe states and not events. This study also showed that short passives, which

do not include the *by*-phrase, are produced and comprehended earlier than long passives, with the *by*-phrase. This fact suggests that children prefer adjectival passives.

In a study on the comprehension and the production of English passives, Maratsos, Fox, Becker and Chalkley (1985) confirmed Horgan's findings: before the age 4-5, English children comprehend and produce actional passive clauses better than nonactional passives. Maratsos et al. (1985) observed that passives with actional verbs, as (18), are preferred over passives with non-actional verbs, as (19).

> 18) Marco è spinto da Sara
>   Marco is pushed by Sara

> 19) Marco è visto da Sara
>   Marco is seen by Sara.

Moreover, this study showed that children prefer passive sentences without the *by*-phrase.

Other authors observed that children before 5;0 years are able to use only adjectival passives. Borer and Wexler (1987) claimed that the mechanism to form A-chain is available to children not earlier than 5;0 - 6;0 years. Therefore, at the early stages of language development, children are able to only produce adjectival passives.

Other studies showed different results. Pinker, Lebeaux and Frost (1987) showed that children comprehended and produced passives with both actional and non-actional verbs, with and without the *by*-phrase. In a study of spontaneous speech of 2;0 year old children speakers of Sesotho (which is a Southern African Language), Demuth (1989) noticed that these children were able to produce passive sentences with the *by*-phrase. These results are in contrast with the assumptions of Borer and Wexler, who declared that children couldn't produce passives with the *by*-phrase before the age of 5 [Guasti, 2002].

Fox and Grodzinsky (1998) attributed children's difficulties with passive clauses to the type of verb. Their findings showed that children perform well in passives with actional verbs both with and without the *by*-phrase. The authors observed that the performance with non-actional verbs is better when the *by*-phrase is not present.

Chilosi and Cipriani (2006) showed that Italian children start to comprehend and produce passive clauses between 4;0 and 6;0 years. In particular, they noticed that, at

the age of 5, children acquire passive sentences with irreversible verbs and at the age of 5;6 they are able to comprehend reversible and reversible passives which describe improbable events.

In summary, children's comprehension and production of passives have the following properties [Guasti, 2002: 252]:

- Passive based on actional verbs are comprehended better than those with non-actional verb;
- the *by*-phrase tends to be omitted;
- Passive tends to describe states and not events;
- In languages where the morphology distinguishes adjectival and verbal passive, adjectival passives are acquired earlier than verbal ones.

2.4.1 The Maturation Hypothesis

To explain children's difficulties in comprehension and production of passive sentences, Borer and Wexler (1987) proposed that children's grammar does not include the mechanism required to form verbal passives; therefore, they only produce adjectival passives. Their theory is called "Maturation Hypothesis". This hypothesis is based on the results they found and on the fact that some syntactic structures are available only at a specific age [Hirsch and Wexler, 2007].

Borer and Wexler (1987) claimed that children are not able to produce verbal passive clauses because they cannot form A-chains, so they cannot assign the thematic role to the moved object. In other words children's difficulties are located in the A-movement. Since the mechanism used to form verbal passives is part of Universal Grammar, it is available to children only after a certain age. Borer and Wexler proposed that this mechanism is subject to maturation. This proposal is called A-chain Deficit Hypothesis (ACDH).

According to this theory, passives with non-actional verbs cannot be comprehended and produced at the early stages of language development because children are not able to form A-chains between the subject in SpecIP and its initial position. This means that the right thematic role is not assigned to the moved object. Hirsch and Wexler (2007) observed that children use some actional passives, so they claimed that children

interpreted these passive sentences as adjectival ones. This is known as Adjectival strategy and it is used in languages in which adjectival and verbal passive are homophonous, as in Italian and in English.

A consequence of this theory is that children cannot use the *by*-phrase since they can only produce adjectival passive clauses.

The Maturation Hypothesis was subject to criticisms. Much recent linguistic theories observed that subjects are based-generated within VP and then they are moved to SpecIP to establish the agreement with the verb. The movement of the subject to SpecIP is an instance of A-movement: it means that an A-chain must be formed between the moved subject and the coindexed trace in VP. If A-movement is not available to children, we expect that they do not produce sentences like (20) [Guasti, 2002: 255].

     20) Alice will jump.

Since children produce sentences like (20), the difficulties cannot be ascribed to A-movement. Borer and Wexler (1992) proposed that "not all A-chains are problematic". The A-chains which connects two theta-positions are problematic [Guasti, 2002].

Another problem for the Maturation Hypothesis comes from sentences with unaccusative verbs. These sentences are similar to passive sentences because they involve A-movement: they involve the movement of the internal argument generated in object position to SpecIP. If children can not form A-chains, they would be expected to avoid sentences with unaccusative verbs. Babyonyshev, Ganger, Pesetsky and Wexler (2001) proposed that children process unaccusative verbs as if they are unergative verbs. This proposal is not confirmed because different studies showed that children are able to distinguish sentences with unergative verbs from clauses with unaccusative verbs.

The presence in children's speech of adultlike clauses poses a problem for the Maturation Hypothesis [Guasti, 2002].

2.4.2 The Theta-role transmission deficit Theory

Different studies showed that children could comprehend and produce *actional* and *non-actional* passive clauses with or without the *by*-phrase. These findings suggest a reformulation of the A-chain deficit Hypothesis by Borer and Wexler.

Fox and Grodzinsky (1998) studied thirteen English-speaking children aged 3;6-5;5. They tested the comprehension of short and long passive clauses with actional and non-actional verbs. All sentences were semantically reversible [Fox, Grodzinsky, 1998: 318]. Their findings were against the Maturation Hypothesis because they showed that children were able to form A-chains. Fox and Grodzinsky (1998) attributed children's difficulties to the presence of a *by*-phrase in passive clauses. The authors proposed the "Theta-role Transmission Deficit Theory". According to this theory, children aren't able to transmit the thematic role of the external argument to the *by*-phrase. Hence, they have problems in long non-actional passives because they involve an A-movement and the process of theta-role transmission. Fox and Grodzinsky (1998) observed that children's performance was better in sentences with non-actional verbs and without the by-phrase: in these sentences, theta-role transmission is not involved. This fact explains children's difficulties in long passives. Also this theory is subjected to criticisms and different studies show opposite results.

2.5 Different studies on the acquisition of passive clauses

Many studies investigated children's comprehension and production of passive sentences. As I said in section 2.4, the debate on the acquisition of these structures is still open. In the following sections, some recent studies will be described.

2.5.1 Driva and Terzi (2008)

Terzi and Wexler (2002) studied Greek children's passives. They tested the comprehension of *actional* and *non-action* passive clauses: "all sentences contained the *by*-phrase" [Driva, Terzi, 2008: 190]. They used a picture verification task, in which children had to identify the picture that corresponded to the target sentence. Children

could choose between two pictures: one corresponded to the sentence read by the experimenter and the other corresponds to a sentence with the target verb but reversed thematic roles. The results showed that children mastered adjectival passives well but they had difficulties in verbal passives. In particular, passives with *non-actional* verbs had lower percentages. The presence of the by-phrase didn't influence the performances.

Driva and Terzi (2008) modified the test used by Terzi and Wexler (2002). They introduced the following changes [Driva, Terzi, 2008: 191]:

- in addition to the three groups (3;8- 3;10/ 4;2-4;10/5;3-5;10), they added a fourth group aged 5;9-6;6.
- They substituted the verbs *feed* and *kick* with *touch* and *brush* because they were easier to depict.
- The photos were shown on a computer screen.
- Children had to choose from three rather than two pictures.

Driva and Terzi (2008) didn't find the same results as Terzi and Wexler (2002). As oppose to the previous study, they did not find a low performance on verbal passives of actional verbs. Adjectival passives of actional verbs were better than the corresponding verbal passives. Children's performance was better with *actional* verbs than *non-actional* ones. As in previous findings, the *by*-phrase did not influence the comprehension of passives: in fact, no difference was found between short and long passive clauses.

The findings of Driva and Terzi (2008) do not support the hypothesis of Fox and Grodzinsky (1998), who claimed that children's difficulties depend on thematic role transmission. On the other hand, the performance in verbal and adjectival passive clauses with actional verbs seems to be in favour of Borer and Wexler (1987)'s maturation hypothesis.

In a study on passive clauses in Italian-speaking typically-development children (aged 3;4-6;2), Volpato, Tagliaferro,Verin and Cardinaletti (2013) found the same result as Driva and Terzi (2008): long passives are not different from short passives for Italian children. Moreover, children's performance is better on passives with *actional* verbs than those with *non-actional* verbs.

2.5.2 Volpato, Verin and Cardinaletti (2012)

Volpato, Verin and Cardinaletti (2012) investigated the production of Italian passive sentences in typically-developing monolingual children aged between 3;5 and 6;2 and in 17 Italian adults. Children were divided into four groups according to their age.

They used a picture description task: two pictures were presented to the children and the experiments asked what was happening to the patient in one of the two pictures. The test included 24 items: 12 actional passives and 12 non-actional passives. In the two pictures, the patient was the same but the agents were different in order to force the production of the *by*- phrase.

Results show that young children are able to produce verbal and adjectival passive clauses. Children produce long passives with both auxiliaries, *essere* and *venire*. It confirms that children have adult-like knowledge of verbal passives. This finding does not support the Maturation hypothesis.

Volpato, Verin and Cardinaletti (2012) observed that some children do not produce passive sentences. The authors claimed "the use of passives may depend on children's language experience" [Volpato, Verin, Cardinaletti, 2012: 389]. Interestingly, a group of children aged 5;2-6;2 produce less passives than another group of children of the same age. This fact supports the authors' assertion that children's performance depends on language experience. Children used different strategies in addition to passive clauses. They produced [Volpato, Verin, Cardinaletti, 2012: 384]:

- Sentences with accusative clitic pronouns (as in 21);
- Sentences with dative clitics (as in 22);
- SVO simple sentences (as in 23);
- Other strategies, which are not taken into account here.

21) Sara <u>lo</u> spinge. (Accusative clitic)
    Sara is pushing him.

22) Sara <u>gli</u> dà un bacio. (Dative clitic)
    Sara is giving him a kiss.

23) Sara spinge Marco.   (SVO)

Sara is pushing Marco.

The production of SVO simple sentences is found in all groups while the use of active sentences with clitic pronouns is typical of older children. The strategy adopted by older children is "the most colloquial strategy used in Italian" [Volpato, Verin, Cardinaletti, 2012: 389]. Studying active sentences with clitic pronouns, the authors observed that the occurrence of preverbal subjects is higher than the occurrence of post-verbal subjects in all groups.

The fact the younger children use few clitic pronouns can be due to their age: clitic pronouns are not available before the age of 5. The use of these pronouns seems to increase with age [Volpato, Verin, Cardinaletti, 2012].

2.5.3 Manetti (2013)

Different researches found that around the age of 5 or 6 children have adult-like competences of passive clauses. The findings are however not homogenous.

Manetti (2013) investigated the production of passive clauses in Italian preschool children, before the age of five. Two picture-description tasks were used: the first was an elicited production task and the second was a syntactic priming paradigm.

The first experiment was the elicited production test in which the stimuli were 8 neutral questions, 8 agent-oriented questions and 8 patient-oriented questions. The agent-oriented questions elicited active SVO sentences, while the patient-oriented question elicited a passive structure or an active structure with a clitic pronoun. The questions were presented randomly. 12 children, aged between 3;5 and 4;6, and 12 Italian- speaking adults participated to the first experiment.

The results showed that children and adults preferred SVO sentences to answer to agent-oriented and neutral questions. After patient conditions, adults used passive structures while children exhibited a preference for active sentences with clitic pronouns. Children produced no passives.

The syntactic priming task was divided into two experiments. In experiment 2, the authors provided passive clauses with the auxiliary *venire*; in experiment 3, they provided copular-passives with the auxiliary *essere*. Their aim was to explore children's

passive competence. In the priming condition, children are exposed to the passive structure, so that the possibility of producing the same structures increases. 36 Italian-speaking children (mean age 4;0) participated in the experiments: 18 in experiment 2 and 18 in experiment 3.

The results showed a main effect of prime for active SVO and passives. After *venire*-passive primes children produced more passive clauses than after *essere*-passive primes. They produced more pronominalized structures in experiment 3 than in experiment 2.

When children produced passives, they used the auxiliary which was given in the passive prime. The author observed different mistakes in children's passive clauses [Manetti, 2013: 12-13]:

- The agent was the subject and the patient was expressed by a prepositional phrase (see example 24);
- Children did not use the preposition *da* ("by) in the PP but they selected other prepositions such as *sotto* ("under"). An example is provided in example 25;
- One child produced the impersonal SI-passive followed by the *by*-phrase, as in 26;
- Children "overgeneralised the passivation to non-passivisable verbs", as in 27.

24) Il leone.agent viene graffiato dalla fatina.patient .   (E 3;6)
    The lion.agent comes scratched by the fairy.

25) L'uomo viene annaffiato *sotto* la ranocchia.   (A 3;8)
    The man comes watered *under* the frog.

26) L'infermiere *si è preso dalla tigre*.   (A 4;1)
    The nurse himself.Cl is taken by the tiger.

27) Il bambino *viene corso* dal cavallo.
    The child comes run by the horse.

The elicited production task showed that children avoided the production of passive clauses in favour of other structures such as active sentences with clitic pronouns.

In the syntactic priming study, the exposure to the structures led to children's production of passive sentences. The results of the experiment 2 and 3 showed a priming effect on active and passive clauses.

In conclusion, at the age of 3;6, Italian children are able to produce long verbal passive clauses. Manetti (2013) underlined that children's production included adult-like structures but also passives with mistakes: the main error was the reversed order of thematic roles. The author also noticed that children tended to produce more passives after the exposure to *venire*-passives than to *copular* passives.

Manetti (2013) concluded that 3- and 4-years old children prefer pronominalized structures in spontaneous production. Under different experimental conditions, they produce long verbal passive with both auxiliaries *venire* and *essere*.

2.5.4 Volpato, Tagliaferro, Verin, Cardinaletti (2013)

Volpato, Tagliaferro, Verin and Cardinaletti (2013) studied the comprehension of verbal passives in a group of Italian typically-developing children, aged between 3;4 and 6;2, and in 17 Italian adults.

The authors used a picture-matching task adapted from the Greek version of the task elaborated by Driva and Terzi (2008). The experimenter read a sentence and the child had to select the photo which corresponds to the sentence. For each item three photos were presented. The test included 24 passives with transitive reversible actional verbs and 16 passives with non-actional verbs. The sentences contained auxiliaries *essere* and *venire* and the *by*-phrase. The pictures were shown on a laptop screen.

The authors found that all groups of children are more accurate in passives with actional verbs than in those with non-actional verbs, as was found for other languages. There are no differences between passives with auxiliary *venire* and *essere*. The authors did not find significant differences between long and short passives sentences, replicating Driva and Terzi (2008) for Greek.

The fact that children comprehend actional passives with auxiliary *venire* shows that they are able to master verbal passive sentences. Passive with *venire* can be only eventive passives. It suggests that children's passives are true eventive passive clauses.

In contrast with the A-chain deficit hypothesis, these results show that A-chains are available to younger children.

The main difficulty, found by the authors, is attributed to the ambiguity of some sentences with auxiliary *essere*.

2.5.5 Studies on hearing-impaired children

All the studies described so far analysed the comprehension and the production of passive sentences in typical-developing children. Studies on the acquisition of these structures in hearing-impaired children are scarce and most of them are about children and adolescents using English.

Researches on hearing children showed that they can master passive clauses before the age 9 but they make mistakes such as the inversion of the agent and the patient. The non-reversible clauses seem to be acquired earlier than reversible ones [see preceding sections].

Schmitt (1968) studied the comprehension and the production of passive sentences in hearing-impaired children, aged between 8;0 and 17;0. The test was a multiple-choice task, and the items were all reversible passive sentences. Results showed that older children were not able to master passive sentences. They had several difficulties both in comprehension and in production. Schmitt (1968) attributed the problem in comprehension to the non-canonical word order found in passive sentences. Passive clauses do not respect the SVO order, and the agent does not precede the verb but it appears after the verb. Hearing-impaired children tend to interpret passive clauses as active: they expect the canonical word order SVO, so they tend to impose this order to all structures. This strategy is also common in normal-developing children but in hearing-impaired children it persists in adolescence [King, Quigley, 1980].

Power and Quigley (1973) investigated the comprehension and the production of passive clauses in a large group of hearing-impaired children, aged between 9 and 18. They tested reversible and non-reversible passive clauses and passives without the *by*-phrase.

Children comprehended better non-reversible passives than reversible ones, and the main difficulties were found in passives without the *by*-phrase. In the production of

these structures, younger children scored lower than the older ones. Power and Quigley (1973) noticed an improvement with age in both tasks but not all adolescents perfectly comprehended and produced passive sentences.

Gormley and McGill-Franzen (1980) showed that problems with passive clauses are not connected to age but to the contexts. They analysed a group hearing-impaired elementary school children. The authors showed that the familiarity of an event and the expectation of an action could help the comprehension of some syntactic structures. On the contrary, isolated sentences are difficult to be parsed.

Franceschini (2013) investigated the difficulties of two Italian hearing-impaired twins with passive sentences. In order to achieve her aims, the authors used two tasks: a comprehension task and a production task. The participants were tested twice: in 2011 and in 2013. In 2013 they were 9 years old. She observed that the twins had problems with passive structures. The results in comprehension showed an improvement during the 15 months between the two administrations of the comprehension task. The presence of by-phrase did not influence their performances. The children provided the highest scores in passive with the verb *venire* ("to come") but they also provided good scores in passives with *essere* ("to be). The children were not able to produce these clauses before the age of 6 although they were able to understand them in part. The twins used different strategies to avoid passive clauses: the main tendency was to produce SVO sentences instead of passive clauses. Franceschini's (2013) findings confirmed that actional passives are comprehended better than non-actional ones.

From these studies it is evident that hearing-impaired children have difficulties with passive structures. While in normal-developing children the problems disappear with age, they persist in hearing-impaired adolescents. As with relative clauses, the main difficulties of hearing-impaired populations are related to functional words and morphology.

CHAPTER 3

STEFANO: GENERAL LINGUISTIC ASSESSMENT

3.1 Introduction

In this chapter, I will describe the subject of my study, a child with temporary hearing loss, and talk about the findings of my previous research about his spontaneous production.

3.2 The subject

The subject of my study is a child called Stefano. When Stefano (born on June, 8th, 2005) was one year old, he received the diagnosis of temporary hearing loss and speech delay. His hearing capacity was restored through an operation, which took place when he was three and a half year old. During the operation, drainages were applied to each ear. These drainages cleaned his ears and, after sixteen month, Stefano entirely recovered hearing. When Stefano started the speech therapy at the age of 4, his speech was characterized by onomatopoeic and gergal expressions. In particular he used the phonemes /p/ and /k/ to substitute all the others and his production was limited to isolated words. When I met him in 2011, he was still using /p/ and /k/ in his speech but he was able to produce simple and complex sentences even if they were characterized by omissions. I saw him during his speech therapy sessions and at his home until March 2012. Then I started an internship with him at "Scuola Elementare N. Sauro" from December 2012 to June 2013.

During this second internship with Stefano, I noticed his linguistic development. At the end of the first year of elementary school, he wrote simple sentences and started to read. The speech therapy, the assistance at school and also at home helped Stefano to also improve his pronunciation. Today Stefano is 9 years old and he doesn't substitute phonemes with /p/ or /k/; his language is more complex and his vocabulary is rich.

During these years I have always met Stefano at his home, not only for my internship, so I had the possibility to observe him in different situations. I noticed that his speech has improved, and it seems that he has recovered his speech delay.

Since Stefano's language development was delayed in 2011, his linguistic recovery is very interesting: he seems to have improved his linguistic abilities in two and half years. This fact suggests that he had not a severe hearing loss. Different degree of hearing loss are distinguished according to the BIAP (Bureau International d'Audiophonologie). In each type of hearing loss, specific frequencies of sound are compromised. Moreover, for each hearing loss specific language properties are compromised [Franceschini, 2013]. I have no access to Stefano's results of the hearing tests, so I don't know what the type of his hearing loss was. Previous results, TCGB results and my observations suggest that he has a mild hearing loss: it means that he had difficulties in following conversations and in the perceptions of consonants. This type of hearing loss would explain Stefano's phonological problems and also his linguistic recovery.

Starting form these observations, I decided to analyse the comprehension and the production of specific linguistic structures such as relative and passive clauses in order to verify if he has really recovered the speech delay.

3.3 Procedure

Before starting with the experiments on relative and passive clauses, Stefano did a test which investigated verbal comprehension. This test is called TCGB ("Test of grammatical comprehension for children"). In September 2011, Stefano was administered this test for the first time and his results were analysed in my BA thesis "*The Acquisition of Syntax: the case of a child with temporary hearing loss*". In February 2014, he was tested again.

In 2011 Stefano was tested during his speech therapy session, while in 2014, he was tested at home. The test and Stefano's results are described in the next sections.

3.4 TCGB

The TCGB is a test of grammatical comprehension for children [Chilosi, Cipriani, 2006]. It is used to test overall verbal comprehension skills of children aged 3;6 to 8;0.

It is a multiple-choice test in which the examiner reads the target sentence and the child has to select the image which corresponds to the target clause. Each page contains four images, and only one of them is the correct image; the other images are used to capture child's attention. The wrong pictures are characterized by "distractors", which are the elements used to distract the child. These elements are divided into two groups: grammatical and lexical elements. In the latter, the wrong pictures differ to the target one because of different lexical elements: verbs or nouns are different from the ones used in the target sentence. Grammatical elements are divided into two subgroups based on the type of clause: in locative, inflectional, affirmative active and passive clauses, they are used to create a grammatical contrast between constituents of the clause. In negative active and passive, relative and dative clauses, these elements consist in changes of constituents' positions in the clause; so the grammatical roles of the constituents are reversed.

The order of presentation of the items is random. Moreover, before starting with the test, a pre-experimental part tests children's knowledge of lexical items proposed in the trials.

The test consists of 76 sentences divided in eight categories, which are:

- Locative clauses: these sentences include locative elements such as *su/giù, sotto/sopra, dentro/fuori, davanti/dietro, da-a* and *tra*. When children are 3;6, they are able to understand some of these elements such as *su/giù, sotto/sopra* and *dentro/fuori*. At the age of 5, all locative elements are accessible to children.

- Inflectional clauses: these sentences are used to test nominal and verbal inflections, which are accessible to 3- to 4- year old children.

- Active clauses: these sentences test the capacity to comprehend subject-verb agreement in sentences with SVO word order. They are divided into two groups: the first one tests only agreement and the second one is more

complex because sentences also contain the object. The comprehension of these clauses is considered completed when children are seven years old.

- Negative active clauses: these are the same sentences as active clauses but they contain negative elements: in some clauses these elements refer to an incomplete action and in other clauses they refer to changes of referents. These sentences seem to be problematic for children until the age of 3;6.

- Affirmative passive clauses: this category contains 4 non- reversible passives, which are formed with both actional and non-actional verbs, and 6 reversible clauses. Three typologies of reversible clauses were tested according to the probability of the event: probable sentences (*La bambina è vestita dalla mamma*, "the child is dressed by the mother), neutral clauses (*Il bambino è spinto dalla bambina*, "the boy is pushed by the girl") and improbable sentences (*Il cane è morso dal bambino*, "the dog is bitten by the child"). These sentences are problematic in children with both typical and atypical language development. Their acquisition starts at the age of 4.

- Negative passive clauses: as in negative active clauses, negative elements are introduced in these sentences. This category contains two SV sentences, two non-reversible S-V-A and two reversible S-V-A sentences. These clauses seem to be comprehended at the age of 4, like passive sentences.

- Relative clauses: these sentences are divided into right-branching relative clauses and center- embedded relative clauses. In the first type, the relative clause is placed on the right side of the main clause, while in the second type, it is placed in the middle of the main clauses. In the test, these clauses are also divided into subject and object relatives. There are right-branching object relatives (*Il babbo tiene il palloncino che il bambino rompe*, "The dad holds the balloon that the child breaks), right-branching subject relatives (*Il gatto salta sul topo che è sulla sedia*, "the cat jumps on the mouse that is over the chair"), center-embedded object relatives (*Il topo che il gatto rincorre ha il formaggio in bocca*, "the mouse that the cat chases has cheese in his mouth") and center-embedded subject relatives (*Il bambino che è sul tavolo mangia la marmellata*, "the child that is over the table eats marmalade"). Children find these sentences very difficult, in particular

center-embedded relatives seem to be more problematic than right-branching relatives.

- Dative clauses: these sentences contain a complement expressing the person or thing to which the action is turned. These sentences seem to be acquired when children are 6;6.

The scores of TCGB are based on child's mistakes. Scores are assigned as follows:

- 0 points if the answer is correct;
- 0.5 if the answer is wrong after the first sentence administration;
- 1.5 if the answer is still wrong after two repetitions of the target clause.

The total score is the sum of the scores of each typology. This classification allows a quantitative analysis but also a qualitative analysis is possible observing the wrong pictures selected by children.

All the items are shown in Appendix A.

3.4.1 TCGB results in 2011

In 2011, Stefano was administered the TCGB test for the first time; he was 6;3. The results showed that his performance was the same children aged 4;6, as we can see comparing his results (Table 1) to the total scores of table 2.

TYPE OF CLAUSES	SCORES
Locative clauses	3
Inflectional clauses	6
Active clauses	2
Negative active clauses	2
Affirmative passive	5
Negative passive clauses	3.5
Relative clauses	2
Dative clauses	0.5
TOTAL	24

Table 1: Stefano's TCGB results (2011)

Età	10°	25°	50°	75°	90°
3;6	53.75	39	35.5	30.7	25
4	49.5	38.8	27	17.7	10.7
4.6	36	28.6	19.5	12.8	7
5	34.7	23	13	8	4
5.6	32	14	7	3	1
6	16	8.7	5.5	3	2
6.6	13	6.9	3.7	2.5	1.5
7	6.3	2.8	2	0.7	0
7.6	6.8	3.8	1.5	1	0.05
8	5.3	3.3	1.7	0.6	0.5

Table 2: TCGB total score (percentile)

Stefano's score was below the 10th percentile for his age (see Table 2). When the score is below the 10th percentile, the performance is considered delayed for the age of the child.

The results showed difficulties in verbal comprehension: in particular locative, inflectional and passive clauses were the most compromised clauses. Affirmative and negative active, relative and dative clauses were comprehended like children aged 4;6, while locative, inflectional, affirmative and negative passive clauses were understood like 4-year-old children.

The results in locative and inflectional clauses show that Stefano did not understand the locative elements *su/giù* and verbal tenses were difficult to comprehend for him.

Stefano failed in the comprehension of the following locative clauses:

Test item 3: La casa è dietro l'albero.

The house is behind the tree.

Test item 10: Vola su.

It flies up

Test item 12: Il bambino è tra il babbo e la mamma.

The child is between the father and the mother.

Test item 14: L'uccellino vola dalla casa al nido.

The bird flies from the house to the nest.

In the test items 3, 12 and 14, Stefano gave the correct answer after one repetition of the clause. In clause 10, he indicated two wrong pictures also after two repetitions.
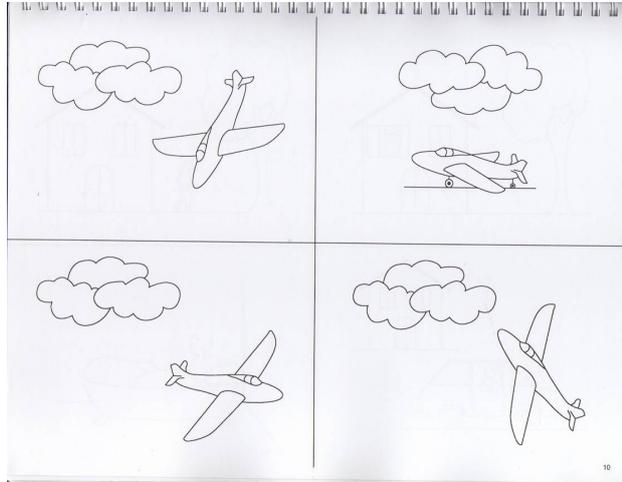
Figure 1: Pictures associated to test item 10

Stefano indicated picture three: the correct interpretation of that picture is "vola" ("it flies") that is exactly the opposite of the target clause "vola su" ("it flies up"). The second answer was picture two, in which the plane stopped.

Stefano also had difficulties in the following inflectional clauses:

Test item 27: Il gatto ha saltato.
        The cat jumped.

Test item 28: La sua mamma.
        His mother.

Test item 30: Il gatto salta.
        The cat jumps.

Test item 38: Il bambino ha fatto il bagno.
        The child took a bath.

Test item 49: Il bambino disegnerà.
        The child will draw.

Test item 56: Il bambino farà il bagno.

The child will take a bath.

In test items 27, 28 and 30, Stefano gave the correct answer after the repetition of the clause; in the other items (38, 49 and 56) he continued to fail. In the items 38, 49 and 56, the verbal tenses are different, and Stefano seemed to have difficulties with verbal tenses: he selected the image representing the progressive action, as we see in the following image representing item 38.

Test item 38: Il bambino ha fatto il bagno.

The child took a bath.
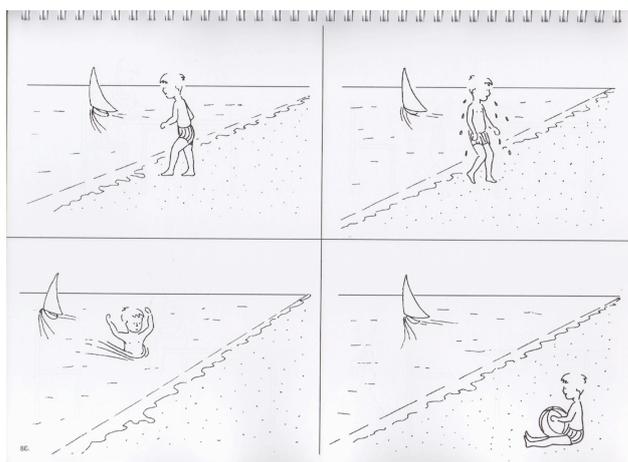
Figure 2: Pictures associated to test item 38

In this case he selected the picture three in which the child is taking a swim but the correct one is the second, which represents the child after having swum.

Stefano gave the wrong answer in four active clauses and one dative clause. In the dative and in two active clauses, he changed his answer giving the correct one after the repetition of the clause. In the following items, he gave the wrong answer also after two repetitions.

Test item 20: La bambina si pettina.

The girl combs her hair.

Test item 53: La bambina non spinge il bambino.

The girl doesn't push the boy.

For example, in the item 20, Stefano selected the image in which the girl combs another child.

Stefano made mistakes in the two relative clauses which follows.

Test item 45: La guardia che ha il fucile ferma il ladro.

The guard who has the shotgun stops the burglar.

Test item 50: Il topo che il gatto rincorre ha il formaggio in bocca.

The mouse that the cat is chasing has cheese in his mouth.

The test item 45 was more problematic than the test item 50: in the latter he gave the correct answer after a repetition of the clause. Stefano didn't comprehend the first clause (test item 45) and indicated two wrong images. First he selected the image that follows the linear order of constituents of the clause: the guard, the shotgun and burglar. His second answer was the image in which the burglar and the guard have a shotgun (see figure 3).

Figure 3: Pictures associated to test item 45

Stefano made a lot of mistakes in both affirmative and negative passive clauses: he didn't understand seven passive clauses and only in two sentences he corrected his answer after the repetition of the clause. The following clauses are the most problematic passives for Stefano.

Test item 40: La macchina è lavata dal bambino.

          The car is washed by the child.

Test item 52: La bambina è vestita dalla mamma.

          The child is dressed by the mother.

Test item 55: Il cane è tirato dall'uomo.

          The dog is stretched by the man.

Test item 57: Il cestino non è stato svuotato.

          The waste hasn't been emptied.

Test item: 66: La mela non è presa dalla bambina

          The apple is not took by the child.

Stefano seemed to have difficulties bound to the negative elements in these clauses: in the items 57 and 66, he selected the images which represent the affirmative passive clause. For example, in the figure 4, he selected the picture two in which the waste has been emptied.
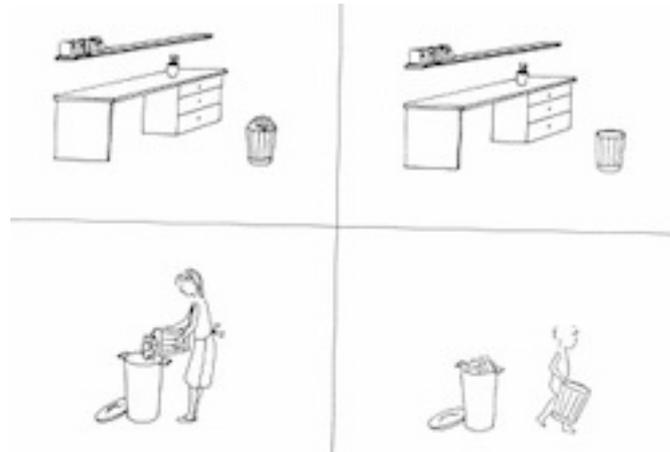
Figure 4: Pictures associated to test item 57

His second answer to item 57 was the forth image in which the waste has been emptied by the child: Stefano chose the picture in which "il bambino" is the agent of the action. I supposed that he interpreted this clause as an affirmative active sentence because also in item 66, he selected the picture corresponding to the active clause.

Another typical error that he made is the inversion of thematic roles: the patient became the agent, as we see in figure 5 representing the test item 52.
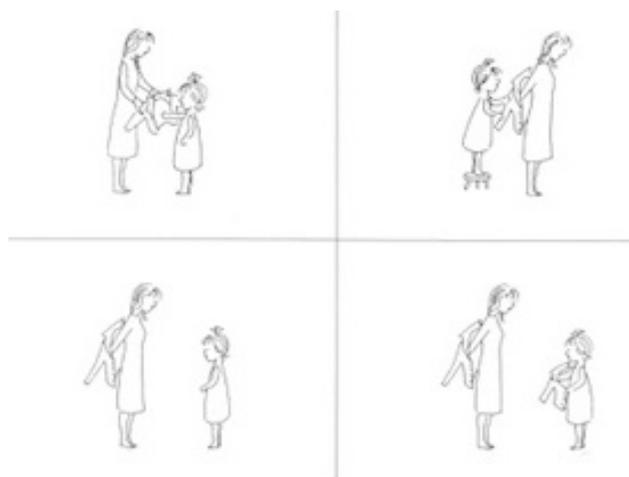
Figure 5: Pictures associated to test item 52

In this case he selected the child who dresses the mother, while in the target the mother dresses the child.

These sentences are problematic also for normal developing children until the age of 5;6 [Chilosi, Cipriani, 2006], so this result could be attributed to his delayed maturation.

Observing these findings, I concluded that Stefano had a delayed verbal comprehension.

3.4.2 TGCB Results in 2014

In February 2014, Stefano was 8;9 and he did the TCGB test again. Table 3 shows his results.

TYPE OF CLAUSES	SCORES
Locative clauses	0.5
Inflectional clauses	1.5
Active clauses	0.5
Negative active clauses	0
Affirmative passive	0
Negative passive clauses	0
Relative clauses	0
Dative clauses	0
TOTAL	2.5

Table 3: Stefano's TCGB results (2014)

Comparing Stefano's score to table 2, we can see that his performance is at 50th percentile: it means that it is on the average with children aged 8 years.

The performance analysis showed that Stefano made mistakes mostly in inflectional clauses but also in locative and affirmative active clauses.

In locative clauses, he only gave a wrong answer in test item 10 (see figure 1): Stefano selected the image in which the plane is flying but when he listened to the clause again, he indicated the image corresponding to the target clause, "Vola Su" ("It flies up"). The same situation appeared in an affirmative active clause, the item 20 "La bambina si pettina" ("The girl combs her hair"): Stefano indicated the picture in which the girl is combing a child but in the second answer, he selected the correct image.

In inflectional clauses, he seemed to have more difficulties: he failed in three sentences with different verbal tenses.

Test item 30: Il gatto salta.

The cat jumps.

Test item 38: Il bambino ha fatto il bagno.

The child took a bath.

Test item 49: Il bambino disegnerà.

The child will draw.

In all cases, Stefano gave the correct answer after repetition. Hence, I supposed that these clauses are difficult for him because of the verbal inflection; he was insecure and needed to listen to the sentences again before giving his answer.

Stefano correctly comprehended negative active, affirmative and negative passive, relative and dative clauses.

3.4.3 Discussion

Comparing the results of table 1 and table 3, it is clear that Stefano has recovered his linguistic delay. While in 2011 his verbal comprehension was below the 10th percentile for his age and it was the same as that of children one and half year younger than him, in 2014 it was on the average with children 9 months younger than him (see table 4).

The TCGB is created for children until the age of 8, so a direct comparison between Stefano and children of his age is not possible.

TCGB RESULTS	2011	2014
Locative clauses	3	0.5
Inflectional clauses	6	1.5
Active clauses	2	0.5
Negative active	2	0
Affirmative passive	5	0
Negative passive	3.5	0
Relative clauses	2	0
Dative clauses	0.5	0
TOTAL	24	2.5

Table 4: Stefano's TCGB results

In 2011, Stefano had difficulties in the comprehension of all types of clauses: the most impaired structures were locative, inflectional, affirmative and negative passive sentences, while affirmative and negative active, relative and dative were less compromised.

In 2014, the child seemed to be not sure of his answer in one locative, three inflectional and one affirmative active clause. Contrary to what he did the first time he was tested, this time Stefano gave the correct answers after one repetition of the target sentences.

I now focus my attention on the items in which he gave the wrong answers. It can be noted that some of the constructions are compromised in both administrations of the test. For example the item 10 "vola su" ("it flies up") wasn't correctly interpreted both times: in the previous TCGB, Stefano didn't understand it even after two repetitions of the target clause, while in the latter he gave the correct answer after one repetition. The same situation is also found with inflectional clauses: both times he had difficulties with items 30 "il gatto salta" ("the cat jumps"), 38 "il bambino ha fatto il bagno" ("the child took a bath") and 49 "il bambino disegnerà" ("the child will draw"). Item 20 "la bambina si pettina" ("the girl combs her hair") was also problematic both times.

For these types of clauses, Stefano showed an improvement: the first time he listened to locative, inflectional and affirmative active items, he needed to listen to them again

but despite the repetitions, he did not interpret them correctly. The second time Stefano was administered the TCGB, he corrected his answer after one repetition of the clause. I suppose that the locative element *su*, verbal tenses, and affirmative active clauses are problematic for Stefano because he continued to be insecure of their correct interpretation, although his performance showed an improved comprehension.

Stefano's improvement is particularly evident in relative, affirmative and negative passive sentences. These structures are particularly difficult for young children; indeed they require more time to be acquired than simple sentences [Guasti, 2007].

As for relative clauses, Chilosi and Cipriani (2006) observed that 5;6 year old children comprehend these sentences. They noticed that there is an order of acquisition: right-branching relatives are interpreted earlier than center-embedded relatives. Chilosi and Cipriani (2006) pointed out different elements that influence the complexity of these sentences. In both right-branching and center-embedded object relatives, the canonical order of constituents, SVO, is not respected. In center-embedded relatives, a relative clause is inserted between the subject of the main clause and its predicate. In object relatives, the complexity is also due to the fact that the relative pronouns have a grammatical role different from that of the noun to which they are referred [Sheldon, 1974].

In 2011 Stefano had a delayed comprehension of relative clauses because he was 6;3 and his performance was between the 10th and the 25th percentile for his age. In 2014 he comprehended this type of sentences.

In TCGB, reversible and non-reversible passive clauses are tested. Chilosi and Cipriani (2006) noticed that children's deficit with these structure is due to the fact that the grammatical subject does not correspond to the agent of the action: for example in test item 52 "La bambina è vestita dalla mamma" ("The child is dressed by the mother"), the grammatical subject is "la bambina" ("the child") but the agent is "la mamma" ("the mother"). The acquisition of these clauses begins when children are between 4;0 and 6;0. Chilosi and Cipriani (2006) observed that children at the age of 5;0 acquire non-reversible passive clauses while the reversible ones continue to be problematic until the age of 6;0. In the case of negative passive sentences, the authors ascribe children's difficulties to the picture representation of negation. As for passive

clauses, Stefano has completely recovered the delay observed in 2011: the results of the last TCGB show that he comprehends passive clauses.

The recent results show that Stefano has recovered his linguistic delay in verbal comprehension: it means that he improved his linguistic abilities in two and a half years. Interestingly, I also noticed a similar improvement in his spontaneous speech. In the next sections, I report the results of my previous research on spontaneous production and then I discuss it.

3.5 Previous Findings

In my BA thesis "*The Acquisition of Syntax: the case of a child with temporary hearing loss*" I analysed the spontaneous speech of Stefano.

I recorded him from October 2011 to March 2012 during the speech therapy sessions and also at his home. During the speech therapy, he did phonetic exercises for discrimination of sounds. The activities were organized as plays and they helped Stefano to articulate similar sounds correctly. The speech therapy went on for 45 minutes. At his home I recorded him when we were playing together with his toys or videogames. His mother and I organized some activities to involve Stefano: for example, we prepared cakes and biscuits together and Stefano had to describe what we were doing. I also tried to read with him some fairy tales and, in order to capture his attention, I organized some activities: for example, I told him a story through images and at the end Stefano had to reorganize the images and told me the story.

The aim of this research was to analyse the syntactic structure of Stefano's production in order to check what the consequences of his temporary hearing loss were and whether he can acquire syntax following normal stages of language acquisition.

As we see in section 3.4.1, the results of TCGB showed that Stefano's performance was the same as that of 4;6 year old children. Hence, this performance was considered delayed. His mistakes were found especially in inflectional, affirmative and negative passive, locative clauses. He had a normal performance in the comprehension of active, negative active, dative and relative clauses.

Differently from his comprehension, Stefano's spontaneous production was considered normal and not delayed. I focused my attention on the syntax of sentences and noun phrases in Stefano's speech.

3.5.1 Syntax in Stefano's speech

Analysing Stefano's sentences, I noticed that he was able to produce simple and complex sentences: only 6% of the clauses I recorded were incorrect. In Stefano's corpus, I found 627 sentences and only 38 of them were characterized by mistakes.

He produced mostly affirmative and interrogative sentences. The incorrect sentences were characterized by omissions of functional words such as clitic pronouns, auxiliaries, and prepositions.

The analysis of Stefano's corpus showed that he correctly used clitic pronouns even if in some cases he omitted them. Examples of correct and incorrect use of these pronouns are provided in 1 and 2, respectively.

    1) Aikami   (6;3.15)
       TARGET: AiutaMI

    2) No dì te   (6;4.20)
       TARGET: No dilLO tu

The use of auxiliaries was mostly correct: he produced 126 sentences with auxiliaries and only in 9 cases, he omitted them. A similar situation was noticed for prepositions: Stefano used prepositions correctly, and only in few cases he omitted them.

I only found one mistake of subject-verb agreement: it meant that he was able to use agreement rules. Interestingly, Stefano also produced infinitive subordinate clauses with modal verbs and subordinate clauses introduced by *perché* ("because"): the latter were always associated to a question. In Stefano's corpus, I did not find relative clauses even if children start to produce them at the age of three. Stefano did not produce passive clauses.

3.5.2 Noun phrases in Stefano's speech

I also analysed Stefano's production of noun phrases. He had no difficulties with NP-agreement and he made only three mistakes in gender's agreement, as the following example shows.

3) Io non ko fare UN forma   (6;5.10)
       TARGET: Io non so fare UNA forma.

Stefano's mistakes represented only 0.9% of his noun phrases[4].

Interestingly, Stefano's speech was characterized by the omission of articles. He omitted masculine articles more frequently than feminine ones. When Stefano produced articles, he tended to omit the "l" with both feminine and masculine articles: the omission of "l" with feminine articles was more frequent than the one with masculine articles[5].

Comparing article and clitic pronouns omissions, I found that Stefano omitted articles more frequently than clitic pronouns. This fact is in line with Bottari's results (1998). Analysing the determiner system of Italian children with specific language impairment (SLI), Bottari (1998) found that clitic omissions were lower than article omissions.

Stefano's noun phrases were mostly pronounced isolated. When NPs were inserted in sentences, Stefano omitted articles in all syntactic positions.

3.6 Conclusions

In my BA thesis, I concluded that Stefano had a delayed language acquisition. I observed a discrepancy between production and comprehension. According to the TCGB test, Stefano's verbal comprehension was seriously compromised but his production seemed to follow normal stages of language acquisition.

In Stefano's corpus, only 6% of clauses and 26% of noun phrases were incorrect. His corpus showed he had difficulties with some structures and some functional words such

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[4] Bernardini (2003) observed that this type of mistakes appeared only in 1% of children's noun phrases. Stefano's production is therefore the same as typically developing children.
[5] Guasti (2007:157) observed that children know that articles are functional elements even if they use them without the "l" component at early stages of language acquisition.

as clitic pronouns and articles. I supposed that his difficulties were bound to his temporary hearing loss, which compromised the input in early years of Stefano's life.

Analysing his spontaneous speech, I did not take into consideration the fact that he had never produced passive clauses and relative clauses. These structures are difficult for children, who acquire them late. The first production of these clauses however seems to begin at the age of 2-3 [Guasti, 2007]. When I recorded him, Stefano was 6 years old, so we would expect that he produced at least some relative and passive clauses. On the contrary, Stefano produced only simple sentences. This fact suggests that he had a delayed language acquisition.

During these years, I had the opportunity to see Stefano in different contexts and I noticed an improvement in his spontaneous speech. His clauses became more complex and his noun phrases are always inserted in sentences. The TCGB confirmed he has recovered his language delay.

In order to verify whether Stefano has completely recovered his language delay, I administered him three tests:

- A test of comprehension of relative clauses;
- A test of comprehension of passive clauses;
- A test of production of relative and passive clauses.

CHAPTER 4

THE EXPERIMENTS ON RELATIVE CLAUSES

4.1 Introduction

In order to verify Stefano's language improvement, I tested his comprehension and production of relative clauses using two different tasks.

In this chapter I will describe the tests and I will discuss Stefano's results.

4.2 Procedure

Stefano was tested at home. He was tested at the end of the school year, when he was less tired than during school. The production task was administered on the second week of June, the comprehension task on the third week of June. The production test was done before the comprehension task to avoid the possibility of a priming effect.

4.3 The production test

The production of relative clauses seems to start at the age of 3 but their comprehension seems to start later [Guasti, 2007]. These sentences are complex structures, and children show many difficulties in their acquisition.

When Stefano was 6;3, he did not use relative clauses in his spontaneous speech. Since his language development was delayed, this fact was considered normal. Today Stefano is 9 years old and should have acquired these structures.

4.3.1 Participants

When Stefano did the elicited production test, he was 9 years old. I will compare his results with a group of 37 children aged between 9 and 10;4 (mean age 9;6), which

corresponds to group G4 in Pivi (2014). The children of the control group do not have any linguistic impairment, hearing or mental disabilities.

4.3.2 Materials

In order to verify Stefano's competence on relative clauses, I elicited the production of these structures by using a test elaborated by Cardinaletti, Pivi and Del Puppo (2011).

The test is presented on a laptop screen, through a Power Point Presentation showing a set of drawings, each one paired with a video and the recorded voices of some puppets eliciting the target sentences.

Each session is audio-recorded and later transcribed. Before starting the task, the puppets were presented to the participants, and the instructions of the game were given.

This task elicited various syntactic structures: relative, cleft, passive sentences and *wh-* questions. 12 fillers are inserted to prevent the child from adopting strategies or losing concentration, as we see in the following example [Pivi, 2014: 61]:

> PUPPET: "Che cosa fa la zebra?"
> "What is the zebra doing?"
> TARGET: " (La zebra) mangia la pizza"
> " The zebra is eating a pizza"

The items were tested randomly. The elicitation task was administered in two sessions.

I administered the test focusing my attention on the production of relative clauses. It elicited subject and object relatives adapting to Italian the Preference Production Task that Novogrodsky and Friedmann (2006) developed for Hebrew. Only the number mismatch condition was used in order to avoid the production of ambiguous sentences.

The test elicited 24 relative clauses: 12 subject relatives and 12 object relatives. The relative items are semantically reversible and contain animate noun phrases. The following transitive actional verbs were used: *lavare* ("to wash"), *sporcare* ("to soil"), *salutare* ("to greet"), *visitare* ("to attend"), *baciare* ("to kiss"), *fermare* ("to stop"), *inseguire* ("to chase"), *toccare* ("to touch"), *sollevare* ("to lift up"), *guardare* ("to look at"), *mordere* ("to bite"), *accarezzare* ("to caress"), *catturare* ("to capture"), *sgridare*

("to scold"), *premiare* ("to reward"), *pettinare* ("to comb"), *tirare* ("to pull") and *mandare via* ("to chase away").

For each item, the puppets introduced the characters and two images, which showed different characters doing the same action (change of agent condition) or the same characters doing different actions (change of action condition). The participant had to choose the image they preferred by telling which characters they liked best; they have to start with "Mi piace..." ("I like…").

Only a number mismatch condition was used (singular head, plural embedded objet/subject), in order to avoid the production of ambiguous sentences

Examples the elicitation of subject and object relative clauses are provided in (1) and (2) respectively:

1) PUPPET: "Ci sono due dottori e due nonne. Un dottore saluta le nonne, l'altro dottore visita le nonne. Quale dottore ti piace?"
EXPERIMENTER: " Inizia con "mi piace…".
TARGET: (Mi piace) il dottore che visita/saluta le nonne.

PUPPET: " There are two doctors and two grandmothers. A doctor is greeting the grandmothers, the other is attending the grandmothers. Which doctor do you like?".
EXPERIMENTER: "Start with "I like…".
TARGET: (I like) the doctor that is greeting/attending the grandmothers.

2) PUPPET: "Ci sono due bambini, due barbieri e due cani. I bambini pettinano un cane, i barbieri pettinano l'altro cane. Quale cane ti piace?".
EXPERIMENTER: "Inizia con "mi piace…"
TARGET: (Mi piace) il cane che pettinano i bambini / i barbieri.

PUPPET: "There are two children, two hairdressers and two dogs. The children are combing one dog, the hairdressers are combing the other dog. Which dog do you like?".
EXPERIMENTER: "Start with "I like…".
TARGET: (I like) the dog that are combing the children / the hairdressers.

Six subject relatives belonged to the change of action condition (as in 1) and the other six belonged to the change of patient condition (as in 3) [Pivi, 2014: 62].

3) PUPPET: " Ci sono due vigili, due cani e due leoni. Un vigile ferma i cani, l'altro vigile ferma i leoni. Quale vigile ti piace?"
EXPERIMENTER: "Inizia con "Mi piace…"
TARGET: (Mi piace) il vigile che ferma i leoni/i cani.

PUPPET: "There are two traffic policemen, two dogs and two lions. A policeman is halting the dogs, the other policeman is halting the lions. Which policeman do you like?"
EXPERIMENTER: "Start with "I like…"
TARGET: (I like) the policeman that is halting the dogs/the lions.

The sam was true for object relative clauses: six ORs presented the change of agent condition (as in 2) and six ORs presented a change of action condition (as in 4) [Pivi, 2014: 63].

4) PUPPET: " Ci sono due nonni e due elefanti. I nonni sollevano un elefante e guardano l'altro. Quale elefante ti piace?
EXPERIMENTER: "Inizia con "Mi piace…"
TARGET: (Mi piace) l'elefante che (i nonni) sollevano/guardano.

PUPPET: "There are two grandparents and two elephants. The grandparents are lifting up one elephant and are staring at the other elephant. Which elephant do you like?
EXPERIMENTER: "Start with "I like…"
TARGET: (I like) the elephant that (the grandparents) are lifting up/staring at.

Productions like (5) or (6) were coded as correct clauses because, in Italian, relative clauses can be introduced either by a lexical NP or by a demonstrative pronoun such as *quello/quella*, [Pivi, 2014: 86].

5) Mi piace **la maestra** che premia i bambini.   (lexical NP)
I like the teacher that is awarding the children.

6) Mi piace **quella** che premia i bambini.   (demonstrative pronoun)

I like the one that is awarding the children.

Relative clauses introduced by a lexical NP are called *headed relatives* (as in 5); relative clauses introduced by a demonstrative pronoun are called *light-headed relatives* (as in 6).

The list of stimuli is shown in Appendix D.

4.3.3 Results

This section presents the results of the production task.

Table 1 shows the percentages of accuracy of both Stefano and the control group G4 in subject (SR) and object relative (OR) clauses.

Participants	SRs		ORs	
	n.	**%**	**n.**	**%**
STEFANO	11/12	92%	0/12	0%
G4	435/444	98%	161/444	37%

Table 1: Percentages of accuracy in SRs and ORs

The results show an asymmetry between subject and object relative clauses. Both Stefano and the control group produced a very high percentage of SRs. Stefano did not produce any object relative clause, while the control group produced 37% of ORs. Despite the results on ORs, Stefano's production of relative clauses seems to be comparable to the one of 9-year-old children.

Table 2 shows the percentages of headed and light-headed SRs produced by all children.

Participants	Headed SRs		Light headed SRs	
	n.	**%**	**n.**	**%**
STEFANO	9/11	75%	2/11	17%
G4	297/435	67%	138/435	31%

Table 2: Percentages of accuracy in headed SRs and light headed SRs

Stefano shows to prefer headed subject relatives: he produced only 2 light-headed subject relatives which are reported in (7) and (8).

7) "Quello che disegna gli uccellini"

    The one that is drawing the birds.

    TARGET: (Mi piace) il coniglio che disegna gli uccellini/le farfalle.

        (I like) the rabbit that is drawing the birds/the butterflies.

8) "io quella che abbraccia le bambine"

    the one that is hugging the little girls.

    TARGET: (Mi piace) la mamma che abbraccia/bacia le bambine.

        I like the mother that is hugging/kissing the little girls.

The control group produced more headed SRs than light-headed SRs but the percentage in the two types of clauses are similar. Different types of errors in children's production of subject relative clauses are found [Pivi, 2014]. Only the following errors are found in the production of Stefano and G4:

- relative clauses introduced by interrogative adverbs, as *dove, quando* or *in cui* ("where, when, in which), instead of the complementizer *che* ("that");
- resumptive object relative clauses instead of SRs;
- other sentences coded as "others".

Six children of the control group made mistakes in SRs. Two children produced 6 relative clauses with the interrogative adverbs instead of the complementizer *che* ("that"), as in (9). Four children produced a resumptive object relative clause with the verb *tirare*, as in (10) [Pivi, 2014: 81-82].

9) "L'orso dove insegue i gatti"   (interrogative adverb)

    The bear where (it) is chasing the cats.

    TARGET: (Mi piace) l'orso che insegue i gatti/i leoni.

        (I like) the bear that is chasing the cats/the lions.

10) "Quello che i bambini lo tirano"

    The one that the children it-CLIT$_{masch.sing.}$are pulling.

    TARGET: (Mi piace) il leone che tira i bambini.

        (I like) the lion that is pulling the children.

In subject relatives, Stefano made only the following mistake which was coded as "other".

11) Mi piace che la maestra premia i bambini.

I like that the teacher is awarding the children.

TARGET: (Mi piace) la maestra che sgrida/premia i bambini

(I like) the teacher that is scolding/awarding the children.

Table 3 shows the percentages of headed and light-headed ORs produced by the children.

Participants	Headed ORs		Light headed ORs	
	n.	**%**	**n.**	**%**
STEFANO	0/0	0%	0/0	0%
G4	102/161	23%	59/161	14%

Table 3: Percentages of accuracy in headed ORs and light headed ORs

Stefano did not produce any target object relatives. The group G4 produced 37% of object relatives: 23% of headed object relatives and 14% of light-headed object relatives.

The production of object relative clauses is frequently avoided by participants in elicitation tasks. Different typologies of answers are found in the production of Stefano and of the group G4 [Pivi, 2014: 89-91]:

- ORs with resumptive clitic pronoun;

12) "Mi piace la bambina che la baciano i cani."

I like the girl that her-CLIT$_{fem\ sing}$ are kissing the dogs.

TARGET: (Mi piace) la bambina che baciano i nonni/i cani.

(I like) the girl that are kissing the grandparents/the dogs.

- ORs with resumptive NP;

13) "Mi piace quella che i bambini guardano la scimmia."

I like the one that the children are looking the monkey.

TARGET: (Mi piace) la scimmia che i bambini guardano/salutano.

(I like) the monkey that the children are looking/greeting.

- Passive object relatives (POR);

14) "Mi piace la bambina che viene baciata dai cani"

I like the little girl that is kissed by the dogs.

TARGET: (Mi piace) la bambina che baciano i nonni/i cani.

(I like) the little girl that are kissing the grandparents/the dogs.

- Passive causative constructions "si fa+verb";

15) "Mi piace il cavallo che si fa toccare dale scimmie."

I like the horse that has itself touched by the monkeys.

TARGET: (Mi piace) il cavallo che toccano i topi/le scimmie.

(I like) the horse that are touching the mice/the monkeys.

- ORs turned into SRs through head inversion;

16) "Quelli che sporcano il cane"

The ones that are soiling the dog

TARGET: (Mi piace) il cane che i papa lavano/sporcano.

(I like) the dog that the fathers are washing/spoiling.

- ORs turned into SRs through theta-roles inversion

17) "Quello che tocca i topi"

 The one that is touching the mice.

 TARGET: (Mi piace) il cavallo che toccano i topi/le scimmie.

(I like) the horse that are touching the mice/the monkeys.

- Use of interrogatives adverbs such as *dove*/*quando* ("where/when") instead of the complementizer *che*;

18) "Quello dove i vigili salutano la maestra."

The one where the policemen are greeting the teacher.

TARGET: (Mi piace) la maestra che i vigili salutano/fermano.

(I like) the teacher that the policemen are greetings/halting.

The following table shows the strategies used by Stefano and G4.

	STEFANO		G3	
	n.	%	n.	%
OR with Clitic	0/12	0%	12/444	3%
OR with resump.NP	0/12	0%	9/444	2%
POR	10/12	83%	155/444	36%
Head-INV	2/12	17%	61/444	14%
Theta-role INV	0/12	0%	9/444	2%
WH-	0/12	0%	20/444	5%
Farsi	0/12	0%	17/444	4%

Table 4: Percentage for each strategy used by Stefano and G4

As table 4 shows, Stefano mainly produced passive object relatives: he produced ten passive object relatives with the auxiliary *venire* and the *by*-phrase (as in 14). Only two times Stefano turned the object relative clause into a subject one through head inversion (as in 16 and 19).

19) "Quelli che fermano la maestra"

 The ones that are stopping the teacher.

 TARGET: (Mi piace) la maestra che i vigili fermano/salutano.

 (I like) the teacher that the policemen are stopping/greetings.

Stefano produced more PORs (83%) than G4 (36%). Like Stefano, children of the control group mainly used passive object relatives with the auxiliary *venire* and the *by*-phrase. Only five children used reduced passive object relatives and two children used PORs with the auxiliary *essere*. Both Stefano and G4 used all passives with the by-phrase. The following table show the percentages of PORs produced by Stefano and G4.

	STEFANO		G4	
	n.	**%**	**n.**	**%**
POR venire	10/10	100%	145/155	94%
POR essere	0/10	0%	5/155	3%
POR ridotta	0/10	0%	5/155	3%
By-phrase	10/10	100%	155/155	100%

Table 5: Percentages for Passive Object Relatives

Like Stefano, G4 turned ORs into SRs through head-inversion (as in 16). Children of the control group also used other strategies, such as [Pivi, 2014: 89-90]:

- ORs with resumptive pronouns or resumptive NP (as in 12 and 13);
- Use of interrogative adverbs instead of the complementizer *che* (as in 18);
- Causative construction "si fa+verb" (as in 15).

Figure 1 shows the distribution of strategies adopted by the group G4, while the figure 2 shows the distribution of strategies adopted by Stefano.
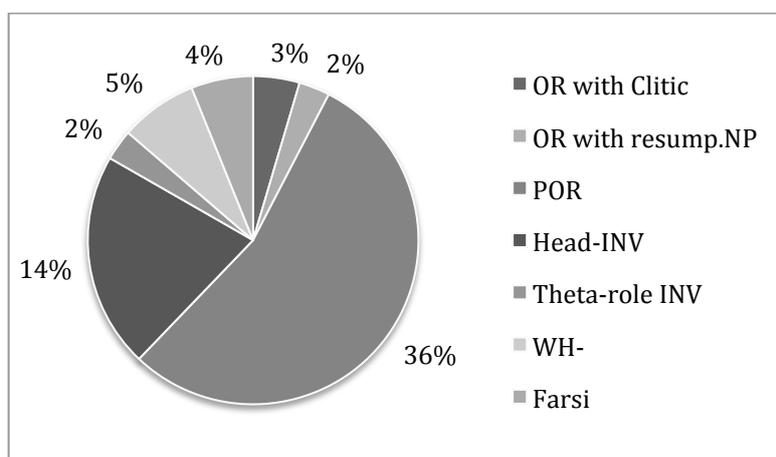
Figure 1: Different strategies adopted by G4
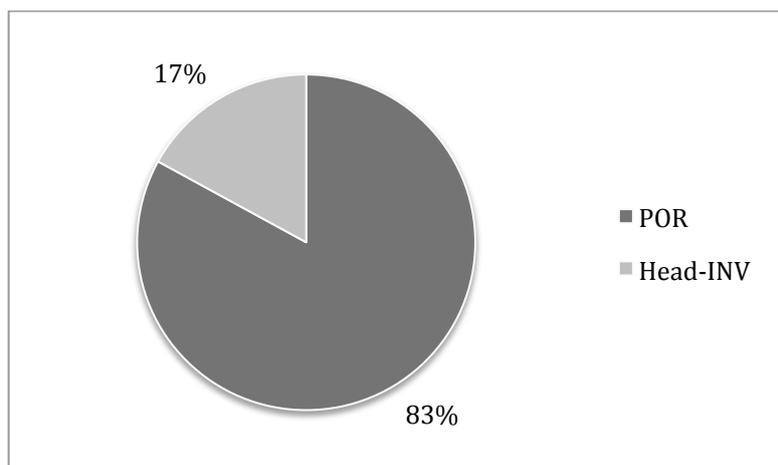
Figure 2: Different Strategies adopted by Stefano

Stefano adopted only two strategies to avoid the production of ORs, while the control group adopted a variety of strategies.

In order to compare Stefano's performance to the performance of G4, I carried out a statistical analysis using the *z-score* which is a type of standard score[6]. Scores obtained in this test were transformed into *z-scores* based on the mean and standard deviation obtained form the control group. *z-Scores* for each sentence type were computed. No relevant deviations from normal values were scored for subject and object relative clauses. It means that Stefano's performance is on the average with the performance of the control group.

4.3.4 Discussion

Results confirmed the asymmetry between the production of SRs and ORs attested in previous studies on Italian and other languages [see chapter 1].

While the control group G4 produced a low percentage of object relative clauses and Stefano systematically avoided them, both Stefano and the control group G4 produced a

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6: "The z-score is a type of standard score that indicates how many standard deviation units a given score is above or below the mean for a certain group". "The z-score is used to describe a particular participant's score relative to the rest of the data" [Tavakoli, 2012: 716- 717]. The z-score of a participant indicates how far from the mean the participant's value varies. The range of the z-score is +/- 1.5 standard deviation: when the score is set between +1.5 and -1.5, it is considered on the average. To calculate the z-score, the following operation has to be used: z = (xm – M)/SD
xm= participant's mean
M= group's mean
SD= standard deviation

high percentage of subject relative clauses. This fact suggests that his production of SRs is on the average with the control group.

The analysis of SRs shows that Stefano prefers to produce headed SRs, in which the relative head is an NP. He produced only 17% of light-headed SRs, in which the relative head is a demonstrative pronoun. The group G4 produced a lower percentage of headed SRs than Stefano because they used many light-headed SRs (31%).

Pivi (2014) observed that younger children prefer to use light-headed subject relatives. The percentage of light-headed SRs decreases until the age of 8, while the percentage of headed SRs increases. Hence, Stefano's performance can be considered normal since he is 9 years old.

In subject relative clauses, Stefano committed only the mistake repeated in (20):

20) "Mi piace che la maestra premia i bambini"

I like that the teacher is awarding the children

TARGET: (Mi piace) la maestra che sgrida/premia i bambini.

(I like) the teacher that is scolding/awarding the children.

Subject relative clauses involve the movement of the embedded subject, which becomes the relative head. The embedded subject is moved out of the relative clause and leaves a trace in its initial position [see chapter 1]. In (20) the embedded subject is in its initial position: the movement of the relative head does not occur. In (20), Stefano avoided movement. This mistake is not attested in the control group G4 and, in Stefano's production, it is coded as "other" because it is not a common strategy in children of his age. This error is typical of 3-to-5 year old children. Contemori and Garaffa (2010) found that young children produced SRs with a resumptive NP in subject position: it seemed that they treated relative clauses as declarative. Pivi (2014) claimed that sentences as (20) can be considered resumptive relative clauses or declarative sentences.

As for ORs production, the results show that ORs are more problematic than SRs, as it was found in many previous studies [see chapter 1]. ORs are frequently avoided or substituted by other structures. Utzeri (2007) found that children produced more ORs than adults and her findings were confirmed by Volpato (2010) and Pivi (2014): the

authors found that neither adolescents nor adults produced object relative clauses while children produced them, sometimes by employing resumptive pronouns

The control group produced only 37% of target ORs and used other strategies to avoid ORs. Children of the control group mainly produced passive object relatives (PORs) instead of ORs. They also turned object relatives into subject relatives through the inversion of the relative head. Only 17 children of G4 used other strategies to avoid ORs. On the contrary, Stefano did not produce any object relative clauses and mainly used one answer typology when ORs were targeted: he turned two ORs into SRs with head-inversion, as in (21). As for the remaining items, Stefano's performance in ORs seems to be the same as adolescents and adults tested by Volpato (2010), who did not produce any ORs and produced POR instead of ORs.

21) "Quelli che sporcano il cane"

The ones that are soiling the dog

TARGET: (Mi piace) il cane che i papa lavano/sporcano.

(I like) the dog that the fathers are washing/spoiling.

The figure 3 shows the distribution of answer typologies used by Stefano and the control group to avoid object relative clauses.
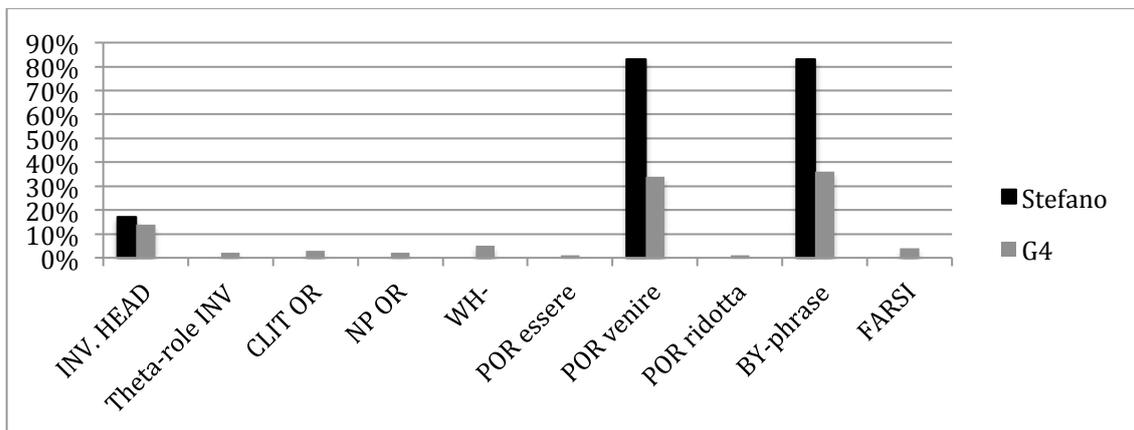
Figure 3: Different strategies used by Stefano and the group G4.

The figure 3 shows Stefano's preference in using PORs instead of ORs. Contemori and Belletti (2013) found that the use of PORs instead of ORs emerges in children around the age of 5 and increases around the age of 8. The production of PORs is the most widespread strategy in adults.

Interestingly, when Stefano and the control group produced PORs, they never omitted the *by-phrase*. Pivi (2014) noted that the use of the *by*-phrase is higher in older children than in younger children and adults never omitted it. Again, Stefano behaves like adolescents and adults: he always produced the *by*-phrase. Stefano's adult-like knowledge is confirmed by the use of the auxiliary *venire* and the lack of causative constructions with *farsi* or *lasciarsi* in his production. Indeed, Pivi (2014) found that adults preferred using the auxiliary *venire* and never produced any causative sentence.

In summary, Stefano's results in the production task suggest that he is able to produce relative clauses, as expected. He produces a very high percentage of SRs, almost 100%, like typically developing children. Furthermore, his behaviour with object relatives suggests that his competence is similar to adults' competence. These findings confirm the expectation that he has recovered his linguistic delay.

4.4 The Comprehension test

The comprehension of relative clauses starts around the age of 5 [Guasti, 2007]. Different studies [Friedmann, Novogrodsky, 2004; Arosio, 2005; Adani, 2008, 2011; Friedmann, Belletti, Rizzi, 2009; Adani, Guasti, Forgiarini, van der Lely, 2009; Volpato, 2010; Pivi, 2014] show a gradient of accuracy in the comprehension of these structures: subject relatives seem to be easier than object relatives.

When Stefano was 6;3, he was administered the TCGB test and showed he understood these structures like 4;6 year old children. In February 2014, he was 8;9 and was administered the TCGB again: the results showed he comprehended relative clauses. In order to verify if he really comprehends these sentences, an agent selection task was used.

4.4.1 Participants

When Stefano was administered the agent selection task, he was 9 years old. I will compare his results with a group of 19 Italian-speaking children aged between 6;1 and 10;3. The choice of these children was based on their results in the TCGB test: they

obtained a score between 1 and 3.5. These scores are similar to Stefano's score, i.e. 2.5. I called this group G1.

In this group, there is a subgroup composed by children aged from 9;0 to 10;3: this subgroup will be named G2.

All the children were administered the task investigating the comprehension of relative clauses developed by Volpato (2010) and did not have any linguistic impairment, hearing or mental disabilities.

4.4.2 Materials

The agent selection task was administered in order to examine Stefano's comprehension of relative clauses. Volpato (2010) developed this task following the tests used for Hebrew [Friedmann and Novogrodzky, 2004; Friedmann and Stzermann, 2006] and for Italian [Adani, 2008].

The experimenter reads the target clause and the participant has to select the referent that correctly matches the sentence. For each trial two opposed scenarios with 4 referents were presented to the child: as Volpato (2010) explained, "one in which two characters perform an action and one in which the same characters perform the same action but with the reversed thematic roles". Before starting the test, participants get to know the lexicon presented in the test and a training part is used to verify that they understand the instructions.

The test includes 80 items: 60 experimental trials and 20 filler sentences. The experimental trials tested ten typologies of relative clauses in match and mismatch conditions[7], each including six items:

- Ambiguous sentences (AMB):

SVO_SG_SG   La pecora che lava il cavallo.

The sheep that washes the horse

SVO_PL_PL   Le pecore che lavano i cavalli.

The sheep that wash the horses.

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[7] In match conditions, the NPs have the same Number features: they are all singular or plural. In mismatch conditions the NPs are different: one is singular/plural and the other is plural/singular.

- Unambiguous subject relative (SR):

	SVO_SG_PL	La pecora che lava i cavalli.
		The sheep that washes the horses.
	SVO_PL_SG	Le pecore che lavano il cavallo.
		The sheep.PL that wash the horse.

- Object relatives with embedded subject in preverbal position (OR):

	OSV_ SG_SG	La pecora che il cavallo lava.
		The sheep that the horse washes.
	OSV_PL_PL	Le pecore che i cavalli lavano.
		The sheep.PL that the horses washes.
	OSV_SG_PL	La pecora che i cavalli lavano.
		The sheep that the horses wash.
	OSV_PL_SG	Le pecore che il cavallo lava.
		The sheep. PL that the horse washes.

- Object relatives with embedded subject in post-verbal position (ORp):

	OVS_SG_PL	La pecora che lavano i cavalli.
		The sheep that wash the horses.
	OVS_PL_SG	Le pecore che lava il cavallo.
		The sheep. PL that washes the horse.

- Fillers (F): SVO   La capra che mangia il gelato.

    The goat that eats the ice-cream.

The possible answers change according to the type of sentence proposed. For the subject (SVO order), only one correct answer is possible; but participants can select the reversed answer, in which the thematic roles are reversed, or other answers, which are not taken into account. For object relatives (OSV and OVS), participants can select the correct answer, the reversed answer, the agent answer (selection of the agent instead of

the head), and other errors. For ambiguous sentences, only two answers can be selected: the correct answer and other errors.

Only animate nouns were used in the experimental trials. In order to avoid troubles caused by the presence of auxiliaries or past participle morphology, Volpato (2010) only used transitive verbs in the present tense. The verbs used in the test are: *lavare* ("to wash"), *colpire* ("to hit"), *inseguire* ("to chase"), *portare* ("to bring"), *tirare* ("to pull"), *beccare* ("to peck"), *spingere* ("to push"), *spaventare* ("to scare"), *toccare* ("to touch"), *pettinare* ("to comb"), *fermare* ("to stop"), *baciare* ("to kiss"), *guardare* ("to look at"), *mordere* ("to bite"), *seguire* ("to follow"), *salutare* ("to greet"), *rincorrere* ("to run after"). All sentences were semantically reversible.

The list of stimuli is shown in Appendix B.

4.4.3 Results

This section presents the results of the comprehension task.

The following table shows the percentages of correct responses for Stefano and the control group G1.

		STEFANO		G1	
		n.	%	n.	%
AMB	SVO_SG_SG	6/6	100%	111/114	97%
	SVO_PL_PL	6/6	100%	108/114	95%
SR	SVO_SG_PL	6/6	100%	111/114	97%
	SVO_PL_SG	6/6	100%	104/114	91%
OR	OSV_SG_SG	6/6	100%	70/114	61%
	OSV_PL_PL	5/6	83%	76/114	67%
	OSV_SG_PL	5/6	83%	86/114	75%
	OSV_PL_SG	3/6	50%	85/114	75%
ORp	OVS_SG_PL	6/6	100%	77/114	68%
	OVS_PL_SG	3/6	50%	58/114	51%
	Mean	52/60	87%	886/1140	78%

Table 6: Percentages of correct responses in each sentence type

Stefano comprehended a high percentage of relative clauses but he made some errors. The percentages of G1 are lower than Stefano's ones. Like the results of the

production task, these results show an asymmetry between subject and object relative clauses.

Stefano performed at ceiling in ambiguous relative clauses (AMB), subject relatives, object relatives with preverbal embedded subject (OR), in which the NPs have the same Number features, and object relatives with post-verbal embedded subject (ORp) in which the head was singular and the embedded DP plural. G1 comprehended a high percentage of subject relative clauses but not of object relative clauses.

Since the mean age of G1 is 8;6, the subgroup G2 was created. The mean age of G2 is 9;6 that is similar to Stefano's age. The following table shows the percentages of accuracy in the comprehension of subject and object relative clauses by Stefano and G2.

		STEFANO		G2	
		n.	%	n.	%
AMB	SVO_SG_SG	6/6	100%	47/48	98%
	SVO_PL_PL	6/6	100%	44/48	92%
SR	SVO_SG_PL	6/6	100%	46/48	96%
	SVO_PL_SG	6/6	100%	43/48	90%
OR	OSV_SG_SG	6/6	100%	24/48	50%
	OSV_PL_PL	5/6	83%	28/48	58%
	OSV_SG_PL	5/6	83%	31/48	64%
	OSV_PL_SG	3/6	50%	37/48	77%
ORp	OVS_SG_PL	6/6	100%	28/48	58%
	OVS_PL_SG	3/6	50%	22/48	46%
	Mean	52/60	87%	350/480	73%

Table 7: Percentages of correct responses in each sentence type

The percentages of the group G2 are lower than Stefano's percentages.

In G1 and G2, ambiguous sentences (AMB) and SRs are more accurate than ORs and ORp. Moreover, ORs are more accurate than ORp, as the tables 6 and 7 show. Stefano performed at ceiling in ambiguous sentences and in SRs. In ORs and ORp his performance depends on the type of clauses. Stefano performed at ceiling in ORs in the match condition but he is less accurate in the mismatch condition. In particular, he seems to have difficulties in the condition in which the relative head is plural. His percentages in ORp confirmed it: when the relative head is singular, Stefano performed at ceiling but, when it is plural, he experienced some difficulties. This is evident in table

6 and 7: when the relative head is plural, Stefano's percentages are lower than the ones of the control groups.

In addition, these results are confirmed by using the binomial distribution. According to the binomial distribution, "a child was considered above chance when he/she answered correctly at least 4 items for each type of relative clauses" [Volpato, 2010: 107], in the case of subject and object relatives. With ambiguous sentences, a child was considered above chance when he/she pointed correctly at all items for each sentence typology

The following table shows Stefano's results according to binomial distribution.

	STEFANO	
	n.	%
SVO_SG_SG	6/6	100%
SVO_PL_PL	6/6	100%
SVO_SG_PL	6/6	100%
SVO_PL_SG	6/6	100%
OSV_SG_SG	6/6	100%
OSV_PL_PL	5/6	83%
OSV_SG_PL	5/6	83%
OSV_PL_SG	3/6	50%
OVS_SG_PL	6/6	100%
OVS_PL_SG	3/6	50%
TOTAL	52/60	87%

Table 8: Stefano's results according to binomial distribution

Stefano performed below chance only in object relatives: in particular in the mismatch condition when the relative head is plural (OSV_PL_SG and OVS_PL_SG). In (22) and (23), examples of these clauses are provided:

22) I gatti-PL che la pecora-SG colpisce. (OR)

The cats that the sheep is hitting.

23) I conigli-PL che tira la gallina-SG (ORp)

The rabbits that hits the chicken.

"The rabbits that the chicken hits".

Stefano committed also two mistakes in object relatives with preverbal embedded subject. One mistake is found in the match condition when all NPs are plural (OSV_PL_PL). The other mistake is made in the mismatch condition in which the relative head is singular (OSV_SG_PL).

In the sentence type OSV_PL_SG, Stefano seems to have more difficulties than G1: his percentage is lower than the one of G1. The same situation appears also comparing Stefano's results to the ones of G2. G2 and Stefano have similar percentages only in sentence type OVS_PL_SG (object relatives with a post-verbal subject). In OSV_PL_PL and OSV_SG_PL Stefano performed above chance. In these sentence types, the percentages of G1 and G2 are lower than the percentages of Stefano.

In order to compare Stefano's results to the performance of G1, I carried out a statistical analysis. Scores obtained in this test were transformed into *z-scores* based on the mean and standard deviation obtained form the control group. *z-Scores*[8] for each sentence type were computed. As for the comprehension of RCs, no relevant deviations were scored for both subject and object relatives. It confirms that Stefano's performance is on the average with children of the control group.

Let us now consider the type of errors made in the interpretation of relative clauses. In the OR and ORp sentences, children could select the reversible answer, the agent answer, or the "other" answer.

In the following table, the percentages of reversible answer selected by Stefano, G1 and G2 are shown.:

	STEFANO		G1		G2	
	n.	**%**	**n.**	**%**	**n.**	**%**
OSV_PL_PL	0/6	0%	16/114	14%	6/48	13%
OSV_SG_PL	1/6	17%	9/114	8%	4/48	8%
OSV_PL_SG	0/6	0%	3/114	8%	3/48	6%
OVS_PL_SG	3/6	50%	17/114	36%	17/48	36%

Table 9: Percentages of reversible errors selection.

In reversible answers, children selected the correct referent but with inverted thematic role. In the sentence type OSV_PL_PL and OSV_PL_SG, Stefano never selected the reversible answer. This answer type was selected by him in OVS_SG_PL

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[8]See note 6

(17%) and in OVS_PL_SG (50%). In (24) and (25), examples of reversible answers in OVS_SG_PL and OVS_PL_SG are provided.

24) Il pinguino_SG che guarda i gatti_PL (OVS_SG_PL)

The penguin that is looking at the cats.

TARGET: Il pinguino che i gatti guardano.

The penguin that the cats are looking at.

25) I conigli_PL che tirano la gallina_SG (OVS_PL_SG)

The rabbits that are pulling the chicken.

TARGET: I conigli che tira la gallina.

The rabbits that is pulling the chicken.

"The rabbits that the chicken is pulling."

As table 9 shows, G1 and G2 selected the reversible answer in all the items analysed. Both groups used this type of answer mainly in OVS_PL_PL and in OVS_PL_SG with post-verbal embedded subjects.

In agent answers, children selected the agent of the action instead of the patient. Table 10 shows the agent answer selected by Stefano, G1 and G2:

	STEFANO		G1		G2	
	n.	**%**	**n.**	**%**	**n.**	**%**
OSV_PL_PL	1/6	17%	18/114	18%	13/48	27%
OSV_SG_PL	0/6	0%	16/114	16%	11/48	23%
OSV_PL_SG	3/6	50%	20/114	18%	8/48	17%
OVS_PL_SG	0/6	0%	14/114	13%	7/48	15%

Table 10: Percentages of 'agent' errors selection

While G1 and G2 selected the agent answer in all the sentence types, Stefano selected this type of answer only in OSV_PL_PL and OSV_PL_SG. Interestingly, Stefano's performance in agent answers is opposite to the one in reversible answers. Agent answers in OVS_PL_PL and in OVS_PL_SG with preverbal embedded subject are provided in (26) and (27), respectively:

26)I serpenti -PL che le tigri-PL guardano. (OVS_PL_PL)

The snakes that the tigers are looking at.

27) I gatti-PL che la pecora-SG colpisce. (OVS_PL_SG)

The cats that the sheep is hitting.

G1 and G2 gave low percentages of answers coded as "other" and Stefano never gave these answers.

From this quantitative analysis, it is possible to conclude that Stefano comprehends relative clauses although he made some mistakes in object relatives in which the relative head was plural.

4.4.4 Discussion

Stefano's results confirm the asymmetry between subject and object relative clauses. In ambiguous sentences (AMB) and in subject relatives (SRs) he performed at ceiling, but in object relatives, his percentages of accuracy are lower. The control groups also achieve higher percentages in ambiguous sentences and in subject relatives than in object relatives. In the performances of both Stefano and the control groups, a gradient of difficulty is found: SRs are more accurate than object relatives with both preverbal and post-verbal subjects. Moreover, ORs with preverbal subjects are easier than ORs with post-verbal subjects. It confirms the findings of previous studies [Arosio, 2005; Adani, 2008; Friedmann, Stzermann, 2006; Volpato, Adani, 2009; Volpato, 2010]

As in production, also in comprehension, Stefano's percentages are higher than the ones of the control groups. Volpato (2010) found that adults performed at ceiling in both ambiguous sentences and SRs. In these sentence types, hearing children and adolescents achieved high percentages of accuracy. We can conclude that Stefano has an adult-like competence in the comprehension of SRs and ambiguous sentences.

In the comprehension of object relatives, the control groups and Stefano show some difficulties. Volpato (2010) noted that adults performed at ceiling in all types of ORs. Stefano's performance is adult-like in two types of ORs. He performed at ceiling in OSV_SG_SG and in OVS_SG_PL. In OSV_SG_PL and OSV_PL_PL (see examples 23 and 25), Stefano gave two wrong answers. Unlike G1 and G2, in OSV_SG_PL he selected the reversible answer in which the thematic-roles are inverted. In OSV_PL_PL, he selected the agent of the action instead of the patient as the control groups. Despite

these mistakes, Stefano produced high percentages in these clauses. Hence, his performance can be considered on the average.

While the problems of G1 and G2 concern all types of object relatives, Stefano's difficulties are concentrated in object relatives with both preverbal and post-verbal subjects in the condition in which the head is plural and the embedded subject is singular (OSV_PL_SG and OVS_PL_SG). In the control groups, there is higher variability in the pattern of responses than in Stefano. This variability was noted by Volpato (2010) comparing children's responses with adolescents' responses.

Volpato (2010) found that typically developing children performed slightly better on the items in which the NPs were dissimilar in terms of number features. On the contrary, Stefano performed better on the items in which both NPs have the same number features than on the items in which the NPs are dissimilar in terms of number features.Similar findings were observed for hearing impaired children using a cochlear implant (Volpato 2010).

Stefano failed in the following OSV_PL_SG with preverbal embedded subject.

28) I gatti che la pecora colpisce.
The cats that the sheep hits.

29) Le bambine che il bambino lava.
The little girls that the child is washing.

30) I leoni che l'elefante guarda.
The lions that the elephant is looking at.

In these clauses, Stefano selected the agent of the action instead of the patient. This type of mistake is attested also in the control groups. Since in these clauses the order of sentence constituents is marked (object-subject-verb), it seems that he only remembered the second part of the clause, so he selected the subject of the action. This tendency was also observed in the children studied by Volpato (2010) and in the hearing impaired subject studied by Friedmann & Szterman (2006).

Stefano failed in the following object relatives with postverbal subjects (OVS_PL_SG):

31) I conigli che tirano la gallina.

    The rabbits that are pulling the chicken.

    TARGET: I conigli che tira la gallina.

          The rabbits that is pulling the chicken.

    "The rabbits that the chicken is pulling".

32) Le ragazze che fermano il vigile.

    The girls that are stopping the policeman.

    TARGET: Le ragazze che ferma il vigile.

          The girls that is stopping the policeman.

    "The girls that the policeman is stopping".

33) Le pecore che colpiscono la gallina.

    The sheep that are hitting the chicken.

    TARGET: Le pecore che colpisce la gallina

          The sheep that is hitting the chicken.

    "The sheep that the chicken is hitting".

In these sentences Stefano selected the reversible referents. This type of answer is attested also in G1 and G2, although their strategies are variable. In sentences (31), (32) and (33), the embedded subject appears in the post-verbal position. The embedded subject is not in its canonical position and the order of sentence constituents is marked (OVS). In these clauses, Stefano selected the correct referent but he inverted the thematic-roles. While in target sentences the relative head has the theta-role of patient, in Stefano's answer the relative head received the thematic role of agent. Selecting the reversible answer, Stefano seems to follow the canonical order of the elements to interpret these sentences; in other words, Stefano interpreted these sentences as subject relatives. Previous research [Volpato, Adani, 2009; Volpato, 2010] found that hearing-impaired children are not sensible to number features and they interpreted object relatives with post-verbal embedded subjects as subject relatives more often than hearing children. They interpreted the sentences on the basis of the canonical word order of constituents. On the contrary, normal-hearing children performed better in mismatch conditions than in match ones.

In summary, Stefano's results in the comprehension task suggest that he is able to comprehend relative clauses, as expected considering his age at the time of the test. In subject relative clauses and in ambiguous sentences, he performed at ceiling like adults. His competence seems to be adult-like also in object relatives in which the relative head is singular. Stefano however had difficulties in object relatives in which the relative head was plural. Unlike children of G1 and G2, Stefano adopted only two strategies to interpret the problematic sentences; he inverted the thematic roles in the object relatives with post-verbal embedded subject OVS_PL_SG and he selected the agent instead of the patient in OSV_PL_SG with preverbal subject. Stefano's strategies are also attested in hearing-impaired children although their performances are less accurate than Stefano's one.

4.5 Production VS Comprehension

The results of the production and comprehension tasks show that Stefano is able to comprehend subject and object relative clauses. He performed better in comprehension than in production, although his percentages are high in both tasks.

The asymmetry between subject and object relatives is confirmed in both comprehension and production. The following figure shows Stefano's accuracy on subject and object relative clauses.
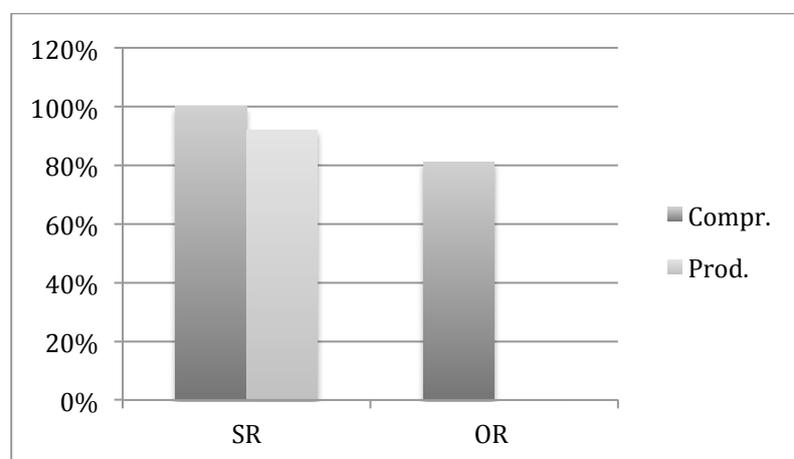
Figure 4: Stefano's accuracy in comprehension and production of SRs and ORs

Stefano had not difficulties in subject relative clauses. In the comprehension of SRs he performed at ceiling like adults. In the production of SRs, his percentage is slightly lower but his performance is on the average with children of his age.

The same pattern is found with object relative clauses. In the comprehension of ORs, Stefano's percentages are higher than the ones of the control groups. He showed difficulties in the mismatch condition: in particular, his problems are concentrated in the clauses in which the relative head is plural. While Stefano achieved a high percentage in the comprehension of ORs, he completely avoided their production. As in the comprehension of SRs, Stefano's performance in the production of ORs is similar to adults' one. Like adults, Stefano produced passive object relatives instead of object relative clauses.

In both tasks, Stefano only adopted two strategies to comprehend and produce ORs. Unlike Stefano, children of the control groups adopted different strategies.

These findings suggest that Stefano has recovered his linguistic delay. The results of the comprehension task confirm the results of TCGB: Stefano is able to understand relative clauses. Results of the production task confirm my observations about his speech. During the meeting with Stefano, I noticed that Stefano improved his spontaneous speech and used also complex sentences: the fact that he is able to produce relative cluases confirms the improvement.

CHAPTER 5

THE EXPERIMENTS ON PASSIVE SENTENCES

5.1 Introduction

Passive clauses are very complex structures, which require a reorganization of the sentence: the patient becomes the subject of the passive clause, and the agent is optionally expressed by a prepositional phrase, the *by*-phrase. Chilosi and Cipriani (2006) noted that children acquire passive sentences around the age of 4;0 and 6;0.

In order to verify Stefano's language improvement, I tested his comprehension and production of passive clauses using two different tasks. In this chapter, I will describe the tests and discuss Stefano's results.

5.2 Procedure

Like in the case of the experiments on relative clauses, Stefano was tested at home. He was tested at the end of the school year. The production task was administered on the second week of June, the comprehension task on the third week of June. The production test was administered before the comprehension task in order to avoid the possibility of a priming effect.

5.3 The Production Test

At the age of 6;3, Stefano did not produce these structures. This fact confirmed his delayed language development. At the time of this experiment, Stefano was 9 years old. The aim is to check whether he has acquired these sentences.

5.3.1 Participants

When I administer the elicited production test, Stefano was 9 years old. I will compare his results with the control group G4, which is the same control group used for the production of relative clauses [see 4.3.1].

5.3.2 Materials

In order to verify Stefano's competence on passive clause, I elicited the production of these structures using a task included in the battery adopted to test relative clauses.

Cardinaletti, Pivi and Del Puppo (2011) developed an elicited production task, which elicited various syntactic structures: relative, cleft, passive sentences, and *wh-* questions. 12 fillers are inserted to prevent the child from adopting strategies or losing concentration. An example is provided in (1) [Pivi, 2014: 61]:

1) PUPPET: "Che cosa fa la zebra?"

"What is the zebra doing?"

TARGET: "(La zebra) mangia la pizza"

"The zebra is eating pizza"

The items are tested randomly. The elicitation task was administered in two sessions.

I administered the test focusing my attention on the production of passive sentences.

This task elicited the production of 12 passive clauses sent by asking to the participants to guess what was happening to a depicted character while he/she was undergoing an action. Importantly, the agent in the pictures is kept invisible. After the participant's answer, a second image containing also the agent is shown to the participant. An example of a passive item is provided in (2):

2) PUPPET: "Indovina! Cosa succede al bambino?"

TARGET: Il bambino viene morso.

PUPPET: "Guess! What happens to the child?"

TARGET: The child is bitten.

The following transitive actional verbs were used: *accarezzare* ("to caress"), *pizzicare* ("to pinch"), *mordere* ("to bite"), *bagnare* ("to dunk") or *spruzzare* ("to splash"), *baciare* ("to kiss"), *appendere* ("to hang up"), *fotografare* ("to take a picture"), *sgridare* ("to scold"), *pettinare* ("to comb"), *graffiare* (" to scratch"), *strozzare* ("to strangle") and *pescare* ("to fish"). The list of stimuli is shown in appendix D.

5.3.3 Results

This section presents the results of the production of passive sentences.

Table 1 shows the percentages of passive sentences produced by Stefano and the control group G4.

	STEFANO		G4	
	n.	%	n.	%
Passive Clauses	1/12	8%	122/444	27%

Table 1: Percentages of accuracy in passive sentences

Stefano did not achieve a very high percentage in the production of passive sentences. He only produced one passive clause, which is shown in (3). This clause was characterized by the auxiliary *venire* and the *by*-phrase.

> 3) "La bambina viene sgridata dalla maestra"
>
> The child is scolded by the teacher.
>
> TARGET: La bambina viene sgridata.
>
> The child is scolded.

The control group produced more passive sentences than Stefano.

The following table shows the percentages of occurrence of the auxiliaries *essere* and *venire*, and of the *by*-phrase.

	STEFANO		G4	
	n.	%	n.	%
Auxiliary *venire*	1/1	100%	109/122	89%
Auxiliary *essere*	0/1	0%	13/122	11%
***BY*-phrase**	1/1	100%	36/122	30%

Table 2: Percentages of occurrence of auxiliaries and *by*-phrase

As table 2 shows, children of G4 prefer using the auxiliary *venire*; very few clauses contain the auxiliary *essere* and the *by*-phrase.

Often, children adopted different types of sentences instead of the targeted passive ones. The following strategies are taken into account:

- Sentences with accusative clitic pronouns with either preverbal (as in 4) or post-verbal subjects (as in 5);

4) Una bambina le dà un bacio.
   A child gives her a kiss.

5) Le dà un bacio la bambina.
   Gives her a kiss the child. ("The child gives her a kiss")

- Sentences with accusative clitic pronouns, in which the subject is   the indefinite pronoun *qualcuno* (as in 6);

6) Qualcuno le dà un bacio/ Le dà un bacio qualcuno.
   Someone gives her a kiss.

- SVO simple sentences (as in 7);

7) La bambina bacia la maestra.
   The child kisses the teacher.

- Simple sentences with reflexive "si" (as in 8);

8) Si dà un bacio.
   She kisses herself.

- Simple sentences with causative "si" (as in 9).

9) Si fa baciare.
   "Someone kisses her"

Children of the control group also used other strategies which are not used by Stefano, as:

-    sentences with accusative clitic pronoun and null subjects (as in 10);

10) Le dà un bacio.

   Gives her a kiss. ("A child gives her a kiss")

- sentences with a different clitic pronoun (as in 11);

11) Gli dà un bacio.
   Give him a kiss. ("A child gives him a kiss")
   TARGET: Le dà un bacio.
              Gives her a kiss. ("A child gives her a kiss")

- active sentences with the indefinite pronoun *qualcuno* and a full object DP (as in 12);

12) Qualcuno bacia la maestra.
      Someone kisses the teacher.

- sentences with the theta-role inversion (as in 13);

13) La maestra bacia la bambina
      The teacher kisses the chils.
      TARGET: La maestra viene baciata.
                 The teacher is kissed.

- "other".

The following table shows the amount of percentages produced by Stefano and G4 for each strategy.

	STEFANO		G4	
	n.	%	n.	%
SV acc. clitic pronoun	3/12	25%	146/444	33%
VS acc. clitic pronoun	0/12	0%	3/444	1%
qualcuno acc. clitic pronoun	2/12	17%	42/444	9%
Null Subject Acc.clitic pronoun	0/12	0%	72/444	16%
Different Clitic pron.	0/12	0%	3/444	1%
SVO sentences	2/12	17%	29/444	7%
qualcuno SVO	0/12	0%	3/444	1%
Theta-role Inversion	0/12	0%	9/444	2%
Reflexive "si"	3/12	25%	4/444	1%
Causative "si"	1/12	8%	0/444	0%
"Other"	0/12	0%	12/444	3%

Table 3: Percentages of sentences produced for each strategy

From table 3, it is evident that group G4 has a favourite strategy: they produced a large amount of active sentences with accusative clitic pronouns. Children of G4 also used active sentences with accusative clitic pronouns and null subjects: they produced 16% of these sentences instead of passives. This strategy is not attested in Stefano's production. Indeed, Stefano mainly produced active sentences with accusative clitic pronouns and full subjects and sentences with reflexive "si". He also used simple active sentences (SVO) and sentences with the indefinite pronoun *qualcuno* and the clitic accusative pronoun. Figure 1 shows the distribution of the strategies adopted by G4 and Stefano.
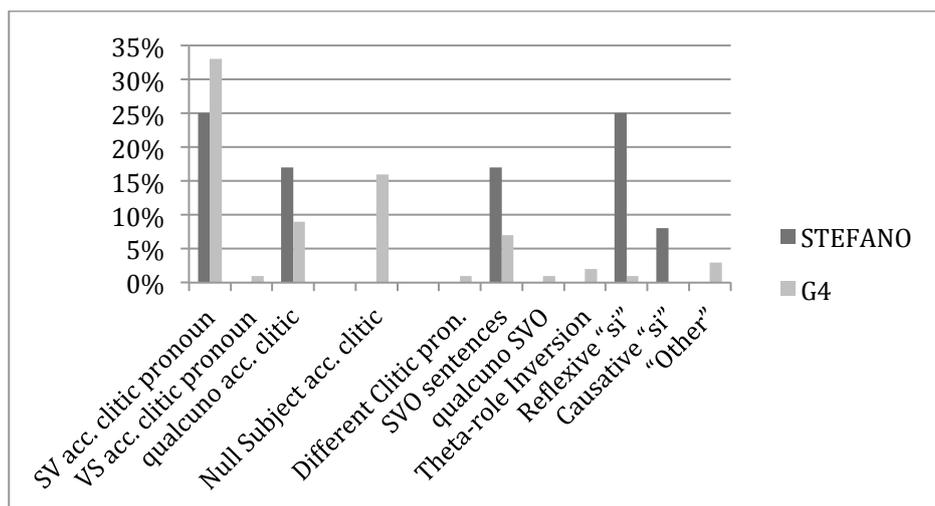
Figure 1: Distribution of the different strategies adopted by Stefano and G4

Figure 1 makes clear the data of table 3: while the strategies used by the control group are variable, Stefano mainly used four strategies.

However, on the whole, Stefano's performance on the production of passive sentences seems to be on the average with children of his age. In order to verify it, I carried out a statistical analysis as I did for the comprehension and the production of relative clauses. Scores obtained in this test were transformed into *z-scores* based on the mean and standard deviation obtained form the control group. *z-Scores*[9] were computed for each sentence type. No relevant deviations were found for passive sentences, active sentences with accusative clitic pronouns and full subjects, sentences with accusative clitic pronouns and the indefinite pronoun *qualcuno* and SVO simple sentences. This analysis confirms that Stefano's performance is comparable to the one of the control group. With regards to sentences with impersonal "si", Stefano's performance was more than 1.5 SD above the average: this result is due to the fact that children of G4 did not use this strategy while Stefano used it frequently, as Figure 1 shows.

Since passive sentences are complex structures and an active counterpart is always available, it is normal that children tended to avoid them. From the quantitative analysis, it is evident that Stefano's performance is normal for his age. Again, Stefano seems to have recovered his linguistic delay.

An explanation of these results is provided in the next section.

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[9] See note 6 in chapter 4.

5.3.4 Discussion

The results confirm the findings by Volpato, Verin and Cardinaletti (2012). Analysing different groups of Italian typically-developing children, they noted that some of the oldest children (aged between 5;2 and 6;2) did not produce any passives. Stefano and the control group produced few passive sentences. In fact, Stefano produced only one passive sentence (see example 2). Volpato, Verin and Cardinaletti (2012) tested two groups of children of the same age, G3 (aged between 5;1 and 6;0) and G4 (aged between 5;2 and 6;2). They observed that G3 produced more passive sentences than G4. Children of G3 were exposed to an oral input rich in passives, via reading aloud of texts containing these structures. The early exposure to reading aloud has a positive influence on the development of syntactic structures [Verin, 2010]. Hence, the exposure to the input helped G3 to produce passive structures. Volpato, Verin and Cardinaletti (2012) concluded that the use of passive sentences may depend on children's language experience. These findings explain the lack of passive sentences in both Stefano's and control group's productions. Moreover, Stefano's delayed language development may influence the production of these structures.

Analysing the passive sentences produced by children, Volpato, Verin and Cardinaletti (2012) and Manetti (2013) noted that children produced long passive with both auxiliaries, *essere* and *venire,* but the auxiliary *venire* is largely preferred. Results of G4 confirmed these findings. Also Stefano produced only one passive with the auxiliary *venire*. Since children are more likely to use the colloquial register and, in Italian, the auxiliary *venire* is more colloquial than *essere*, children prefer using the auxiliary *venire* [Volpato, Verin, Cardinaletti, 2012].

With respect to the *by*-phrase, Volpato, Verin and Cardinaletti (2012) observed that children did not always use it. On the contrary, adults never omitted it. G4 behaves like children tested by Volpato, Verin and Cardinaletti (2012).

As regards the strategies adopted to avoid passive sentences, the use of SVO simple sentences is found in the productions of both children and adults [Volpato, Verin, Cardinaletti, 2012; Manetti, 2013]. This strategy, which is not pragmatically adequate in the relevant context, is not frequently used by G4 and Stefano used it only in two cases (see 14 and 15).

14) Un bambino tocca i cani.

 A child is touching the dogs.

 TARGET: I cani vengono accarezzati.

  The dogs are caressed.

15) Il gatto pettina il topo.

 The cat is combing the mouse.

 TARGET: Il topo viene pettinato.

  The mouse is combed.

Older children tended to produce active sentences with accusative clitic pronouns. [Volpato, Verin and Cardinaletti, 2012; Manetti, 2013]. Stefano and the control group G4 largely used this strategy as well. Volpato, Verin and Cardinaletti (2012) noted that in active sentences with accusative clitic pronouns, the occurrence of preverbal subjects is higher than the occurrence of post-verbal subjects. G4 preferred preverbal subjects but some children also used post-verbal subjects. Children of the control group also produced active sentences with clitic pronouns and null subjects. This strategy is not attested in Stefano's productions: he preferred using full subjects in preverbal position (see examples in (16), (17), and (18).

16) Un cane l'ha morso.

 A dog bit him.

 TARGET: Un bambino viene morso.

  A child is bitten.

17) Una bambina la bacia.

 A little girl kisses her.

 TARGET: La maestra viene baciata.

  The teacher is kissed.

18) Un leone la graffia.

 A lion is scratching her.

 TARGET: La bambina viene graffiata.

  A little girl is scratched.

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This use of clitic pronouns is frequent from the age of 5, and increases with age [Volpato, Verin, Cardinaletti, 2012].

Stefano substituted the subject with the indefinite pronoun *qualcuno* in two active sentences with clitic pronouns. Stefano's sentences are provided in the following examples:

19) Qualcuno lo bagna.

Someone is dunking him.

TARGET: Il gatto viene bagnato.

The cat is dunked.

20) Qualcuno lo manda giù.

Someone is swallowing him.

TARGET: Il bambino viene pescato.

The child is fished.

This strategy is attested also in G4. The absence of the agent in the images makes this answering strategy available to children: since they cannot see the agent, they can express it with the indefinite pronoun *qualcuno*. In other production tests, the presence of the agent in the pictures is meant to elicit the by-phrase [Volpato, Verin, Cardinaletti, 2012]. When the agent is explicit, children cannot express it with the indefinite pronoun *qualcuno*.

Interestingly, Stefano also produced 3 sentences with the reflexive "si" which are reported in the following examples:

21) Si dà un pizzicotto.

He is pinching himself.

TARGET: Il bambino viene pizzicato.

The child is pinched.

22) Si è appesa.

She is hanging up herself.

TARGET: La bambina viene appesa.

The little girl is hanged up.

23) Si fa una foto.

He is taking a picture of himself.

TARGET: Il papa viene fotografato.

The father is photographed.

Since the images to elicit passive sentences do not contain the agent of the action, Stefano can have difficulties in interpreting the actions represented in the images. In (21), (22) and (23), Stefano turned the patient into the agent of the action, as in (24):

24) Il papà fa una foto.

The father photographs something.

TARGET: il papà viene fotografato

The father is photographed.

Observing example (24), it is evident that the patient of the target sentence, *il papà* ("the father"), becomes the agent in the active sentence. While in (24) the subject is explicit, it is substituted by reflexive "si" in (21), (22) and (23). The use of this strategy can be attributed to the fact that the images only presented the patient. Stefano's difficulties can also be due to the representations of the verbs *pizzicare* ("to pinch") and *appendere* ("to hang up"), which were not clear. Only 4 children of the control group used this strategy. Moreover, children tested by Volpato, Verin and Cardinaletti never use reflexive "si". Manetti (2013) found that a child (aged 4;1) produced a large amount of reflexive "si" passive clauses followed by the *by*-phrase. Different from this child, Stefano produced active sentences with reflexive "si".

Stefano only used one sentence with causative "si", which is provided in (25). This strategy is not attested in the control group.

25) L'oca si fa stragolare da un bambino.

The goose makes herself strangled by a child.

TARGET: L'oca viene strangolata.

The goose is strangled.

In summary, Stefano's results in the production task suggest that his production of passive clauses is on the average with children of his age. Both Stefano and the control group avoided the production of passive sentences using an alternative strategy to refer

to the topic patient, namely active sentences with clitic pronouns. The lack of passive sentences in children's production can be ascribed to their language experience [Volpato, Verin, Cardinaletti, 2012].

5.4 The Comprehension test

Chilosi and Cipriani (2006) noted that passive sentences start to be acquired around the age of 4. Other studies [Horgan, 1978; Maratsos, Fox, Becker, Chalkley, 1985; Pinker, Labeaux, Frost, 1987; Demuth, 1989; Driva, Terzi, 2008; Volpato, Verin, Cardinaletti, 2012] showed that, at the age of 3, children are able to produce and comprehend passive sentences.

In September 2011, Stefano did the TCGB, and the results showed that he did not comprehend passive sentences. He was 6;3 but his performance was the same as 4-year-old children. In February 2014, Stefano did the TCGB again and his performance showed that he can understand these structures. In order to verify if he really comprehends these sentences, I used a picture-matching task.

5.4.1 Participants

When I administered the picture-matching task, Stefano was 9 years old. I will compare his results with a group of 16 Italian-speaking children aged between 5;6 and 6;2. The children are younger than Stefano.

None of the children had any linguistic impairment, hearing or mental disabilities.

5.4.2 Materials

A picture-matching test was used to investigate the comprehension of passive clauses. Verin (2010) developed the test adapting to Italian a test developed by Driva and Terzi (2008) for Greek.

The task contains 40 passives and 10 active sentences, used as fillers. Passive clauses proposed in this task can be classified in the following categories:

- 24 passives with actional verbs;
- 16 passives with non-actional verbs.

In each category, half are passive clauses containing the auxiliary *essere* ("to be") and the other half are passives with the auxiliary *venire* ("to come"). Moreover, the comprehension of passives with and without the *by*-phrase is tested.

Actional verbs presented in the test were: *prendere a calci* ("to kick"), *inseguire* ("to chase"), *spingere* ("to push"), *imboccare* ("to feed"), *baciare* ("to kiss") and *colpire* ("to hit"). Non-actional verbs were: *amare* ("to love"), *sentire* ("to hear"), *vedere* ("to see") and *annusare* ("to smell").

Before starting the test, a training part is used to introduce the characters and to verify whether children know the verbs.

The test is presented on a laptop screen. For each item, a slide containing three photos was shown to the participants. Each photo displayed two characters, which are doing something. Children have to choose the picture showing the answer the question asked by the experimenter, as in the following example.

Experimenter: "In quale foto Marco è spinto da Sara?"

" In which photo is Marco pushed by Sara?"
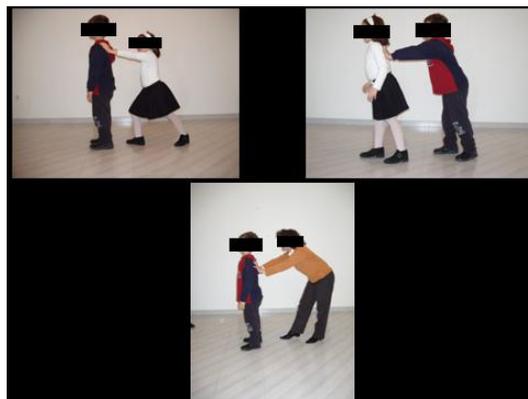
Figure 2: Photos representing the item "Marco è spinto da Sara" ("Marco is pushed by Sara")

In figure 2, the first photo represents the item "Marco è spinto da Sara" ("Marco is pushed by Sara") and it is the answer to the experimenter's question.

When the trials tested sentences containing the *by*-phrase, one of the three pictures represents the target sentence (picture on the left in figure 2), a second picture contains

the same characters of the target but the thematic roles are reversed (picture on the right in figure 2), and a third picture shows the correct patient but a different agent (the last picture in figure 2).

Figure 3: Photos representing the item "Sara è imboccata" ("Sara is fed")

In the trials testing sentences without the *by*-phrase, one picture represents the target sentence (photo on the right in figure 3), a second one shows the same characters of the target but thematic role are reversed (photo on the left in figure 3), and the third picture contains a patient different from the target one (the last photo of figure 3).

The list of stimuli is shown in the appendix C.

5.4.3 Results

This section presents the results of the comprehension task. Stefano was administered the comprehension task twice, in June and September 2014. The following table shows the percentages of correct responses for Stefano and the control group G3.

	STEFANO				G3	
	June		September			
	n.	%	n.	%	n.	%
Passive Sentences	35/40	88%	39/40	98%	569/640	87%

Table 4: Percentages of correct responses

The percentages of accuracy are very high for both Stefano and the control group G3. While in June Stefano's percentage of accuracy was low, in September it improved. In June, Stefano's percentage of accuracy was similar to the percentage of the control

group. In September, Stefano performed better than the younger group G3. While in June Stefano failed in the comprehension of five sentences, in September he gave only one wrong answer. These results suggest that Stefano is able to comprehend passive sentences, and his performance is almost at ceiling.

Passive sentences with both actional and non-actional verbs were tested. Examples of actional and non-actional passives are provided in (26) and (27), respectively.

26) Marco è spinto da Sara.

Marco is pushed by Sara.

27) Marco è visto.

Marco is seen.

The following table shows the percentages of Stefano and of the control group in both types of passive sentences.

	STEFANO				G3	
	June		September			
	n.	%	n.	%	n.	%
Actional Verbs	24/24	100%	24/24	100%	371/384	97%
Non-actional Verbs	11/16	69%	15/16	94%	198/256	77%

Table 5: Percentages of accuracy with actional and non-actional verbs.

In passive sentences with actional verbs, Stefano performed at ceiling both in June and in September. In this type of passives, also the percentage of G3 is high, almost at ceiling.

Passive sentences with non-actional verbs seem to be more problematic. In June, Stefano's percentage in these sentences was lower than the percentage of the control group. On the contrary, in September, Stefano's percentage is higher than the one of the control group.

Both types of passive were divided in 4 subgroups:

- passive sentences with the auxiliary *essere* (as in 26);
- passive sentences with the auxiliary *essere* and the *by*-phrase (as in 27);
- passive sentences with the auxiliary *venire* (as in 28);
- passive sentences with the auxiliary *venire* and the *by*-phrase (as in 29).

28) Marco viene spinto.

   Marco is pushed.

29) Marco viene visto da Sara.

   Marco is seen by Sara.

Since in passives with actional verbs Stefano and the control group performed almost at ceiling, these subgroups are taken into account only for passive sentences with non-actional verbs. The following table shows the results of Stefano and the control group.

	STEFANO				G3	
	June		September			
	n.	**%**	**n.**	**%**	**n.**	**%**
Essere	4/4	100%	4/4	100%	48/64	75%
Essere + by-phrase	2/4	50%	4/4	100%	42/64	66%
Venire	2/4	50%	3/4	75%	60/64	94%
Venire + by-phrase	3/4	75%	4/4	100%	48/64	75%

Table 6: Percentage in the four subgroups of passives

Analysing Stefano's results, the improvement in the comprehension of these types of passive sentences is evident.

In June, Stefano had difficulties mainly in non-actional passives with auxiliary *essere* and the *by*-phrase, and in passives with auxiliary *venire* but without the *by*-phrase. His percentages were lower than the ones of the control group. Since Stefano performed at ceiling with both auxiliaries and with the *by*-phrase in passives with actional verbs, these results can be ascribed to the class of verbs: non-actional verbs seem to be more difficult to comprehend and produce [Horgan, 1978; Foz, Grodzinsky, 1998; Driva, Terzi, 2008; Volpato, Tagliaferro, Verin, Cardinaletti, 2014].

In September, Stefano's performance improved and his percentages became higher than the ones of the control group. Only in non-actional passives introduced by auxiliary *venire*, Stefano's percentage remains lower than the percentage of G3. Stefano's had difficulties in parsing non-actional verbs with auxiliary *venire*.

As I did for the production task, I carried out a statistical analysis using the *z-score*[10], in order to compare Stefano's performance with the one of G3. *z-Scores* were

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[10] See note 6 in chapter 4.

computed for each type of sentences. Both in June and September, no relevant deviations were found for passive sentences with actional verbs and for passives with non-actional verbs with both auxiliaries and the *by*-phrase. As for passives with non-actional verbs and the auxiliary *essere*, Stefano's performance was more than 1.5 SD above the average both in June and in September. Indeed, Stefano performed at ceiling in these sentences. In June, Stefano's performance was below the average in non-actional passives with *venire*. In September no relevant deviations were found for this type of clauses: it means that Stefano's performance is on the average with the one of the control group.

From this quantitative analysis, it is possible to conclude that Stefano comprehends passive clauses with both actional and non-actional verbs. The statistical analysis shows that Stefano performed better than the control group. This result can be ascribed to the age of the children of G3: Stefano was older than the children of the control group.

A qualitative analysis of these results is provided in the next section.

5.4.4 Discussion

Stefano's results confirm that passives with non-actional verbs are more problematic than passives with actional verbs, as was found for English [Horgan, 1978; Maratsos, Fox, Becker, Chalkley, 1985; Fox, Grodzinsky, 1998], for Greek [Driva, Terzi, 2008], and for Italian [Volpato, Tagliaferro, Verin, Cardinaletti, 2013].

This asymmetry between passives with actional and non-actional verbs is evident from the responses in June: while Stefano performed at ceiling in passives with actional verbs, he gave the wrong answer in five passive sentences with non-actional verbs.

Also the results of the control group confirmed this asymmetry. Children of G3 performed at chance in passives with actional verbs but they had difficulties in passive sentences with non-actional verbs. The mistakes of G3 were concentrated mainly in long passives with both auxiliaries *essere* and *venire* and in short passives with auxiliary *essere*. They performed above chance in non-actional passives with auxiliary *venire*. On the contrary, Stefano's mistakes were mainly concentrated in long passives with auxiliary *essere* and in short passive sentences with auxiliary *venire*.

Stefano's wrong answers are provided in the following examples.

30) Sara ama Marco.

Sara loves Marco.

TARGET: Sara è amata da Marco.

Sara is loved by Marco.

31) Marco sente Sara.

Marco listens to Sara.

TARGET: Marco è sentito da Sara.

Marco is listened by Sara.

32) Sara ama Marco

Sara loves Marco

TARGET: Sara viene amata

Sara is loved.

33) Marco sente Sara.

Marco listens to Sara.

TARGET: Marco viene sentito.

Marco is listened.

34) Marco sente Sara.

Marco listens to Sara.

TARGET: Marco è sentito da Sara.

Marco is listened by Sara.

Analysing Stefano's answers, it seems that he selected the images corresponding to active sentences. In the images selected by Stefano, the thematic roles are inverted: for example, in (31) "Marco" is the patient and "Sara" is the agent but, in Stefano's answer, "Marco" becomes the agent and "Sara" the patient. This observation suggests that Stefano interpreted these sentences following the linear order of constituents.

Interestingly, Stefano's difficulties concern two non-actional verbs: *amare* and *sentire*. It is difficult to represent these two verbs; indeed, in the corresponding images, it is not easy to determine who did what to whom [Volpato, Verin, Cardinaletti, 2012; Franceschini, 2013]. Hence, Stefano's difficulties can be ascribed to the misunderstanding of the images.

The results administered in September show an improvement of Stefano's comprehension of passive sentences with non-actional verbs. He made only one mistake, which is shown in (31). His percentage in short passives with auxiliary *venire* improved but it is still lower than the percentage of the control group. Since his performance has improved, the repetition of the error with the clause in (31) confirms that Stefano's difficulties can be ascribed to the unclear images.

In September, Stefano performed at ceiling almost in all passive sentences. In his performance, no significant difference is found between long and short passives. The *by*-phrase did not influence the comprehension of passive sentences. Volpato, Tagliaferro, Verin and Cardinaletti (2014) found that adults performed at ceiling in all sentences, while children had difficulties with non-actional verbs. Stefano's performance confirms the findings of Volpato, Tagliaferro, Verin and Cardinaletti.

In summary, Stefano's results in the comprehension task suggest he is able to comprehend passive clauses. He performed at ceiling in passives with actional-verbs both in June and in September. In June, his performance in passive sentences with non-actional verbs is on the average with younger children, as those of the control group G3. In September, his performance with non-actional verbs is almost at ceiling. This fact suggests that his competence is similar to adults' one.

5.5 Production VS Comprehension

The results of the production and comprehension tasks show that Stefano is able to parse passive sentences. The following figure compares Stefano's percentages of accuracy in the comprehension and in the production of passive sentences.
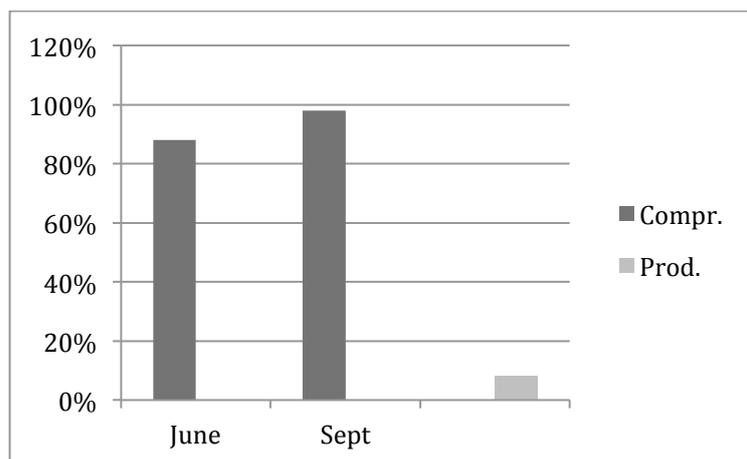
Figure 4: Stefano's accuracy in comprehension and production of passive sentences

From figure 4, it is evident that Stefano performed better in comprehension than in production.

In June, Stefano's performance in comprehension is on the average with children of the control group. In September he performed at ceiling, like adults.

In production, Stefano tended to avoid passive sentences adopting different strategies, which were used also by children of the control group. Hence, his performance is on the average with children of his age.

While he seems to have adult-like competence in the comprehension of passive sentences, his performance in the production of these structures is not similar to adults' one. Indeed, Volpato, Verin and Cardinaletti (2012) found that adults produced passive clauses.

These findings suggest that Stefano has recovered his linguistic delay. Results of the comprehension task confirm the results of TCGB: Stefano is able to understand passive clauses. Results of the production task show that Stefano's performance is on the average with children of his age.

CONCLUSIONS

The main aim of this work was to study the comprehension and the production of relative and passive clauses in a 9-year-old child with temporary hearing loss in order to verify if he has recovered the linguistic delay found in 2011.

Three tests were administered to achieve my aim: an agent selection task for the comprehension of relative clauses, a picture-matching task for the comprehension of passive sentences and an elicited production task for the production of both relative and passive clauses.

Analysing Stefano's comprehension and production of relative and passive clauses, his linguistic recovery is evident.

Stefano's performance in the production of relative clauses is on the average with children of his age. Moreover, the analysis of the production of object relative clauses shows that Stefano uses adult-like strategies. The same situation is also observed in the comprehension of subject relative clauses. Stefano's percentages are always higher than the percentages of the control groups. These findings suggest that Stefano is able to produce and comprehend relative clauses. Furthermore, he seems to have an adult-like competence. Stefano's performance on relative clauses is in line with the findings of previous studies on the acquisition of these structures in normal-hearing children, adults and adolescents

Passive sentences are more complex than relative clauses for children. Stefano was tested twice in the comprehension of passive sentences. The first results show he was on the average with younger children. The latter results show that he performed almost at ceiling, as adults. On the contrary, Stefano tended to avoid the production of passive sentences adopting different strategies; he produced only one passive sentence. Like children of the control group, Stefano tended to turn passive structures into active sentences. Previous studies on the acquisition of these sentences found that children aged between 5;2 and 6;2 avoided the production of these structures, while adults produced them. Although Stefano produced only one passive sentence, his performance is in line with findings of previous studies and it is on the average with the performance

of children of his age. Hence, Stefano is able to comprehend and produce these structures.

The result analysis led to some interesting observations. Although Stefano had a delay language development caused by the temporary hearing loss, he has recovered his linguistic delay. In 2011, he had already recovered his hearing but his comprehension and his spontaneous speech were very delayed for his age. Today his comprehension and his speech are the same as children of his age. This fact suggests that Stefano has recovered his linguistic delay in two and a half years. I suppose that this recovery is possible because he recovered his hearing during the critical period. Children are able to learn a language spontaneously until the age of 8. Since Stefano recovered his hearing and received the linguistic input during the critical period, a linguistic recovery can be expected. Furthermore, I suppose that Stefano's hearing loss was not severe and it did not cause serious damages. It would be interesting to see Stefano's hearing tests to understand more about his lingusitic recovery.

While a comparison between the results found in 2011 and the ones found in 2014 is possible for comprehension, the same comparison is not possible for production. Stefano did the TCGB in 2011 and in 2014. Hence, I compared the results obtained in 2011 with the ones obtained in 2014. In 2011, Stefano did not produce these complex structures and I supposed he was not able to produce them. I did not use specific tests for the production of these clauses. In spontaneous speech, relative and passive clauses are not frequently used. Hence, a comparison is not possible.

Stefano found some difficulties related to the tests themselves. The production task was long lasting and Stefano found it difficult to be focused on the test for long time. Stefano had difficulties to interpret some images which elicited the production of passive clauses. The same situation appears in the task of comprehension of passive clauses, in which he had difficulties in interpreting some images representing non-actional verbs.

Despite these difficulties in the tasks, Stefano performed well and his results show that a linguistic recovery is possible if children are exposed to the linguistic input during the critical period.

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APPENDIX A: TCGB

1) La palla è sotto il tavolo.

2) Il gatto è vicino alla sedia.

3) La casa è dietro l'albero.

4) Corre giù.

5) Il cane è dentro la macchina.

6) La palla è tra il tavolo e la sedia.

7) Il cane corre dalla casa all'albero.

8) Il cane è sopra la sedia.

9) Il gatto è lontano dalla sedia.

10) Vola su.

11) Il bambino è fuori.

12) Il bambino è tra il babbo e la mamma.

13) Il cane è davanti alla cuccia.

14) L'uccellino vola dalla casa al nido.

15) Sedie.

16) Bambino.

17) La mamma lava.

18) Cane.

19) Camminano.

20) La bambina si pettina.

21) Maestra.

22) Il bambino fa il bagno.

23) Vola.

24) Il loro cane.

25) La mamma pettina la bambina.

26) Il bambino non dorme.

27) Il gatto ha saltato.

28) La sua mamma.

29) Il gatto rincorre il cane.

30) Il gatto salta.

31) Il bambino rincorre la bambina che è in bicicletta.

32) La mamma lava la bambina.

33) Il suo cane.

34) Il bambino imbocca la mamma.

35) La loro mamma.

36) La bambina non corre.

37) Il bambino spinge la bambina.

38) Il bambino ha fatto il bagno.

39) Il bambino che è sul tavolo mangia la marmellata.

40) La macchina è lavata dal bambino.

41) Il gatto salta sul topo che è sulla sedia.

42) La macchina tira il camion.

43) La bambina dà la cartella al bambino.

44) Il gatto non mangia il pesce.

45) La guardia che ha il fucile ferma il ladro.

46) La rondine porta il verme all'uccellino.

47) La mela è mangiata dalla bambina.

48) Il bambino non mangia la minestra.

49) Il bambino disegnerà.

50) Il topo che il gatto rincorre ha il formaggio in bocca.

51) Il bambino porta il gatto al topo.

52) La bambina è vestita dalla mamma.

53) La bambina non spinge il bambino.

54) Il babbo porta le sigarette al bambino.

55) Il cane è tirato dall'uomo.

56) Il bambino farà il bagno.

57) Il cestino non è stato vuotato.

58) Il bambino è spinto dalla bambina.

59) Il pianoforte non è suonato.

60) Il babbo tiene il palloncino che il bambino rompe.

61) La mamma è presa in braccio dal bambino.

62) Il bambino non è spinto dalla bambina.

63) La pipa non è fumata dall'indiano.

64) Il babbo mette le scarpe al bambino.

65) Il libro è letto dal bambino.

66) La mela non è presa dalla bambina.

67) La bambina è pettinata dalla mamma.

68) Il babbo non bacia la mamma.

69) Il vaso che il bambino dipinge è sulla sedia.

70) La palla colpisce il bambino.

71) Il cane è morso dal bambino.

72) Il cane morde la palla che il bambino colpisce.

73) Il film è visto dal bambino.

74) Il cane porta il maiale alla pecora.

75) La carta brucia il bambino.

76) Il cane è non è rincorso dal gatto

APPENDIX B: RELATIVE SENTENCES' COMPREHENSION TASK

TEST DI COMPRENSIONE FRASI RELATIVE						
NOME						
DATA						
TRAINING		Tocca il cane che indica i topi				
TRAINING		Tocca il topo che corre				
		INDICA:	**A**	**B**	**C**	**D**
SVO_SG_SG	1	La pecora che lava il cavallo	A	C	C	A
OSV_SG_SG	2	La gallina che il pulcino becca	R	A	AG	C
SVO_PL_SG	3	I leoni che guardano l'elefante	C	A	A	R
F	4	Il cane che ha l'osso in bocca			C	
OSV_SG_PL	5	Il pinguino che i gatti guardano	R	A	AG	C
SVO_PL_PL	6	I pesci che tirano i pinguini	A	C	C	A
OSV_PL_SG	7	I gatti che la pecora colpisce	C	AG	R	A
F	8	Il topo che legge un libro.				C
OVS_PL_SG	9	I conigli che tira la gallina	C	AG	A	R
SVO_PL_SG	10	Le scimmie che fermano il pinguino	C	A	A	R
F	11	La bambina che corre in bicicletta.		C		
SVO_SG_SG	12	Il cammello che pettina il cigno	C	A	A	C
OSV_SG_PL	13	Il nonno che i pinguini lavano	AG	C	A	R
SVO_SG_PL	14	Il coniglio che colpisce i topi	A	R	A	C
F	15	Il nonno che guarda la televisione.	C			
SVO_PL_SG	16	I cani che toccano il ragazzo	A	R	C	A
OSV_PL_SG	17	Le scimmie che l'elefante insegue	R	A	AG	C
OSV_SG_SG	18	L'elefante che l'uccellino porta	AG	C	A	R
F	19	La scimmia che è in acqua			C	
OVS_PL_PL	20	Le moto che le macchine spingono	AG	C	R	A
OVS_SG_PL	21	La pecora che tirano le scimmie	C	AG	A	R
F	22	Il gatto che suona la chitarra.		C		
OVS_PL_SG	23	I nonni che tocca la tartaruga	R	A	C	AG

OSV_SG_PL	24	La giraffa che le zebre tirano	C	AG	A	R
SVO_SG_PL	25	Il pesce che segue le tartarughe	A	R	C	A
OSV_SG_SG	26	La lepre che la giraffa saluta	AG	C	R	A
OVS_SG_PL	27	Il cammello che lavano gli orsi	R	A	AG	C
F	28	L'elefante che piange			C	
OSV_PL_SG	29	Le tartarughe che l'orso saluta	AG	C	R	A
SVO_PL_PL	30	I topi che spingono le galline	C	A	A	C
F	31	Il leone che gioca con la palla.		C		
OVS_PL_PL	32	Le oche che i pinguini fermano	A	R	AG	C
OVS_SG_PL	33	L'uccellino che guardano i cani	C	AG	A	R
SVO_SG_SG	34	La moto che segue la macchina	A	C	C	A
F	35	La mucca che suona la tromba				C
OVS_PL_SG	36	Le ragazze che ferma il vigile	A	R	C	AG
SVO_PL_SG	37	Le tigri che mordono il cavallo	C	A	A	R
OSV_PL_SG	38	Le bambine che il bambino lava	R	A	C	AG
SVO_SG_PL	39	Il cavallo che insegue i leoni	C	A	A	R
F	40	Il bambino che fa il bagno		C		
SVO_PL_PL	41	I gattini che guardano le capre	A	C	C	A
OSV_SG_SG	42	Il bambino che la nonna pettina	R	A	AG	C
SVO_PL_PL	43	Le galline che portano i lupi	A	C	C	A
OSV_SG_PL	44	Il ragazzo che i cani toccano	R	A	AG	C
F	45	La bambina che salta la corda	C			
SVO_SG_PL	46	La giraffa che pettina gli orsi	A	R	C	A
OVS_SG_PL	47	Il cigno che beccano i pulcini	R	A	AG	C
SVO_SG_SG	48	La giraffa che tocca il coniglio	C	A	A	C
F	49	La rana che salta.		C		
OVS_PL_SG	50	I bambini che insegue il cavallo	C	AG	A	R
OVS_PL_PL	51	Gli asini che i cani lavano.	AG	C	R	A
OSV_SG_SG	52	Il leone che la tartaruga tira	C	AG	A	R
F	53	Il coniglio che legge			C	
SVO_SG_SG	54	Il cane che spaventa il coniglio	C	A	A	C
F	55	La capra che mangia il gelato.		C		
OVS_PL_SG	56	I gattini che guarda il pinguino	R	A	AG	C
OVS_PL_PL	57	Le mucche che i cammelli tirano	A	R	C	AG

OVS_SG_PL	58	La macchina che seguono i camion	AG	C	R	A
F	59	Il coniglio che beve			C	
OSV_SG_PL	60	Il pinguino che le scimmie fermano	AG	C	R	A
SVO_PL_PL	61	Gli asini che lavano gli orsi	C	A	A	C
OSV_SG_SG	62	L'elefante che la scimmia insegue	R	A	AG	C
SVO_PL_SG	63	I pinguini che lavano il nonno	R	A	C	A
F	64	Il bambino che dorme			C	
OVS_PL_PL	65	I serpenti che le tigri guardano	C	AG	A	R
OVS_PL_SG	66	Le pecore che colpisce la gallina	C	AG	R	A
F	67	Il papà che scrive.				C
SVO_SG_PL	68	Il bambino che lava le bambine	A	C	A	R
OSV_PL_SG	69	I leoni che l'elefante guarda	AG	C	R	A
F	70	La zebra che balla.			C	
SVO_SG_SG	71	L'orso che saluta la tartaruga	A	C	C	A
OVS_SG_PL	72	La tigre che baciano le bambine	R	A	C	AG
SVO_PL_SG	73	Le zebre che tirano la giraffa	R	A	A	C
F	74	La bambina che tiene il palloncino	C			
OSV_SG_PL	75	Il cavallo che le tigri mordono	R	A	AG	C
OVS_PL_PL	76	Le rane che le ragazze seguono	A	R	C	AG
F	77	Il bambino che ha il cane	C			
SVO_PL_PL	78	Le macchine che tirano i camion	C	A	A	C
SVO_SG_PL	79	La pecora che colpisce i gatti	A	C	A	R
OSV_PL_SG	80	Gli orsi che la giraffa pettina	R	A	AG	C

APPENDIX C: PASSIVE SENTENCES' COMPREHENSION TASK

TEST DI COMPRENSIONE FRASI PASSIVE				
NOME				
	Frasi	**Foto 1**	**Foto 2**	**Foto 3**
1.	In quale foto Marco è spinto da Sara?			
2.	In quale foto Sara è imboccata?			
3.	In quale foto Marco colpisce la sedia?			
4.	In quale foto Marco è visto da Sara?			
5.	In quale foto Sara viene presa a calci			
6.	In quale foto Sara è colpita da Marco?			
7.	In quale foto Marco spinge la sedia?			
8.	In quale foto Marco è sentito?			
9.	In quale foto Marco viene spinto da Sara?			
10.	In quale foto Sara viene imboccata?			
11.	In quale foto Sara viene amata?			
12.	In quale foto Marco è annusato?			
13.	In quale foto Sara ama l'orsacchiotto?			
14.	In quale foto Sara viene colpita da Marco?			
15.	In quale foto Sara è presa a calci?			
16.	In quale foto Marco viene visto da Sara?			
17.	In quale foto Sara è amata da Marco?			
18.	In quale foto Marco è spinto?			
19.	In quale foto Sara bacia il cane?			
20.	In quale foto Marco è baciato da Sara?			
21.	In quale foto Marco è visto?			
22.	In quale foto Sara viene amata da Marco?			
23.	In quale foto Sara è inseguita da Marco?			
24	In quale foto Sara annusa il fiore?			
25.	In quale foto Sara è colpita?			

26.	In quale foto Marco è sentito da Sara?			
27.	In quale foto Marco viene spinto?			
28.	In quale foto Marco insegue la palla?			
29.	In quale foto Marco viene baciato da Sara?			
30.	In quale foto Marco viene annusato?			
31.	In quale foto Sara viene colpita?			
32.	In quale foto Marco sente la radio?			
33.	In quale foto Sara viene inseguita da Marco?			
34.	In quale foto Sara è amata?			
35.	In quale foto Marco viene visto?			
36.	In quale foto Sara è imboccata da Marco?			
37.	In quale foto Marco è baciato?			
38.	In quale foto Marco viene sentito?			
39.	In quale foto Sara imbocca la bambola?			
40.	In quale foto Sara è presa a calci da Marco?			
41.	In quale foto Sara è inseguita?			
42.	In quale foto Marco viene sentito da Sara?			
43.	In quale foto Sara guarda la palla?			
44.	In quale foto Sara viene imboccata da Marco?			
45.	In quale foto Marco viene baciato?			
46.	In quale foto Marco è annusato da Sara?			
47.	In quale foto Marco prende a calci il cuscino?			
48.	In quale foto Sara viene presa a calci da Marco?			
49	In quale foto Sara viene inseguita?			
50.	In quale foto Marco viene annusato da Sara?			

APPENDIX D: PASSIVE AND RELATIVE SENTENCES' PRODUCTION TASK

SUBJECT RELATIVE CLAUSES:

1) Mi piace il coniglio che disegna gli uccellini / le farfalle

2) Mi piace la mamma che abbraccia / bacia le bambine

3) Mi piace il dottore che saluta / visita le nonne

4) Mi piace il vigile che ferma i cani / i leoni

5) Mi piace l'orso che insegue i leoni / i gatti

6) Mi piace la bambina che guarda / saluta i cavalli

7) Mi piace la bambina che prende le api / le farfalle

8) Mi piace la maestra che sgrida / premia i bambini

9) Mi piace il bambino che saluta le mucche / i cani

10) Mi piace il papà che sporca i bambini / i topi

11) Mi piace il papà che sgrida / bacia i gatti

12) Mi piace il leone che insegue/tira i bambini

OBJECT RELATIVE CLAUSE:

1) Mi piace il cane che i papà lavano /sporcano

2) Mi piace la bambina che baciano i nonni / i cani

3) Mi piace la maestra che i vigili fermano / salutano

4) Mi piace il cavallo che toccano le scimmie / i topi

5) Mi piace l'elefante che sollevano le mamme / i papà

6) Mi piace il bambino che gli orsi mordono / accarezzano

7) Mi piace l'elefante che i nonni sollevano / guardano

8) Mi piace il cane che pettinano i bambini / i barbieri

9) Mi piace la tigre che vedono i bambini/i gatti

10) Mi piace il vigile che i cani mordono/inseguono

11) Mi piace la scimmia che guardano i gatti/i bambini

12) Mi piace il gatto che i bambini accarezzano/mandano via

PASSIVE CLAUSES:

1) I cani vengono accarezzati

2) il bambino viene pizzicato

3) il bambino viene morso

4) la maestra viene baciata

5) il gatto viene bagnato/spruzzato

6) la mamma viene stesa/appesa

7) il papà viene fotografato

8) la bambina viene sgridata

9) il topo viene pettinato

10) la bambina viene graffiata

11) l'oca viene strozzata

12) il bambino viene pescato

APPENDIX E: THE RESULTS OF THE COMPREHENSION OF RELATIVE CLAUSES

TEST DI COMPRENSIONE FRASI RELATIVE						
NOME		**STEFANO**				
DATA						
TRAINING		Tocca il cane che indica i topi				
TRAINING		Tocca il topo che corre				
		INDICA:	**A**	**B**	**C**	**D**
SVO_SG_SG	1	La pecora che lava il cavallo	A	C	C	A
OSV_SG_SG	2	La gallina che il pulcino becca	R	A	AG	C
SVO_PL_SG	3	I leoni che guardano l'elefante	C	A	A	R
F	4	Il cane che ha l'osso in bocca			C	
OSV_SG_PL	5	Il pinguino che i gatti guardano	R	A	AG	C
SVO_PL_PL	6	I pesci che tirano i pinguini	A	C	C	A
OSV_PL_SG	7	I gatti che la pecora colpisce	C	AG	R	A
F	8	Il topo che legge un libro.				C
OVS_PL_SG	9	I conigli che tira la gallina	C	AG	A	R
SVO_PL_SG	10	Le scimmie che fermano il pinguino	C	A	A	R
F	11	La bambina che corre in bicicletta.		C		
SVO_SG_SG	12	Il cammello che pettina il cigno	C	A	A	C
OSV_SG_PL	13	Il nonno che i pinguini lavano	AG	C	A	R
SVO_SG_PL	14	Il coniglio che colpisce i topi	A	R	A	C
F	15	Il nonno che guarda la televisione.	C			
SVO_PL_SG	16	I cani che toccano il ragazzo	A	R	C	A
OSV_PL_SG	17	Le scimmie che l'elefante insegue	R	A	AG	C
OSV_SG_SG	18	L'elefante che l'uccellino porta	AG	C	A	R
F	19	La scimmia che è in acqua			C	
OVS_PL_PL	20	Le moto che le macchine spingono	AG	C	R	A
OVS_SG_PL	21	La pecora che tirano le scimmie	C	AG	A	R
F	22	Il gatto che suona la chitarra.		C		
OVS_PL_SG	23	I nonni che tocca la tartaruga	R	A	C	AG

OSV_SG_PL	24	La giraffa che le zebre tirano	C	AG	A	R
SVO_SG_PL	25	Il pesce che segue le tartarughe	A	R	C	A
OSV_SG_SG	26	La lepre che la giraffa saluta	AG	C	R	A
OVS_SG_PL	27	Il cammello che lavano gli orsi	R	A	AG	C
F	28	L'elefante che piange			C	
OSV_PL_SG	29	Le tartarughe che l'orso saluta	AG	C	R	A
SVO_PL_PL	30	I topi che spingono le galline	C	A	A	C
F	31	Il leone che gioca con la palla.		C		
OVS_PL_PL	32	Le oche che i pinguini fermano	A	R	AG	C
OVS_SG_PL	33	L'uccellino che guardano i cani	C	AG	A	R
SVO_SG_SG	34	La moto che segue la macchina	A	C	C	A
F	35	La mucca che suona la tromba				C
OVS_PL_SG	36	Le ragazze che ferma il vigile	A	R	C	AG
SVO_PL_SG	37	Le tigri che mordono il cavallo	C	A	A	R
OSV_PL_SG	38	Le bambine che il bambino lava	R	A	C	AG
SVO_SG_PL	39	Il cavallo che insegue i leoni	C	A	A	R
F	40	Il bambino che fa il bagno		C		
SVO_PL_PL	41	I gattini che guardano le capre	A	C	C	A
OSV_SG_SG	42	Il bambino che la nonna pettina	R	A	AG	C
SVO_PL_PL	43	Le galline che portano i lupi	A	C	C	A
OSV_SG_PL	44	Il ragazzo che i cani toccano	R	A	AG	C
F	45	La bambina che salta la corda	C			
SVO_SG_PL	46	La giraffa che pettina gli orsi	A	R	C	A
OVS_SG_PL	47	Il cigno che beccano i pulcini	R	A	AG	C
SVO_SG_SG	48	La giraffa che tocca il coniglio	C	A	A	C
F	49	La rana che salta.		C		
OVS_PL_SG	50	I bambini che insegue il cavallo	C	AG	A	R
OVS_PL_PL	51	Gli asini che i cani lavano.	AG	C	R	A
OSV_SG_SG	52	Il leone che la tartaruga tira	C	AG	A	R
F	53	Il coniglio che legge			C	
SVO_SG_SG	54	Il cane che spaventa il coniglio	C	A	A	C
F	55	La capra che mangia il gelato.		C		
OVS_PL_SG	56	I gattini che guarda il pinguino	R	A	AG	C
OVS_PL_PL	57	Le mucche che i cammelli tirano	A	R	C	AG

OVS_SG_PL	58	La macchina che seguono i camion	AG	C	R	A
F	59	Il coniglio che beve			C	
OSV_SG_PL	60	Il pinguino che le scimmie fermano	AG	C	R	A
SVO_PL_PL	61	Gli asini che lavano gli orsi	C	A	A	C
OSV_SG_SG	62	L'elefante che la scimmia insegue	R	A	AG	C
SVO_PL_SG	63	I pinguini che lavano il nonno	R	A	C	A
F	64	Il bambino che dorme			C	
OVS_PL_PL	65	I serpenti che le tigri guardano	C	AG	A	R
OVS_PL_SG	66	Le pecore che colpisce la gallina	C	AG	R	A
F	67	Il papà che scrive.				C
SVO_SG_PL	68	Il bambino che lava le bambine	A	C	A	R
OSV_PL_SG	69	I leoni che l'elefante guarda	AG	C	R	A
F	70	La zebra che balla.			C	
SVO_SG_SG	71	L'orso che saluta la tartaruga	A	C	C	A
OVS_SG_PL	72	La tigre che baciano le bambine	R	A	C	AG
SVO_PL_SG	73	Le zebre che tirano la giraffa	R	A	A	C
F	74	La bambina che tiene il palloncino	C			
OSV_SG_PL	75	Il cavallo che le tigri mordono	R	A	AG	C
OVS_PL_PL	76	Le rane che le ragazze seguono	A	R	C	AG
F	77	Il bambino che ha il cane	C			
SVO_PL_PL	78	Le macchine che tirano i camion	C	A	A	C
SVO_SG_PL	79	La pecora che colpisce i gatti	A	C	A	R
OSV_PL_SG	80	Gli orsi che la giraffa pettina	R	A	AG	C

C, AG, R, A= Child's Answer

APPENDIX F: THE RESULTS OF COMPREHENSION OF PASSIVE CLAUSES

Results of June 2014

TEST DI COMPRENSIONE FRASI PASSIVE				
NOME	**STEFANO**			
	Frasi	**Foto 1**	**Foto 2**	**Foto 3**
1.	In quale foto Marco è spinto da Sara?	X X		
2.	In quale foto Sara è imboccata?		X X	
3.	In quale foto Marco colpisce la sedia?	X X		
4.	In quale foto Marco è visto da Sara?	X X		
5.	In quale foto Sara viene presa a calci			X X
6.	In quale foto Sara è colpita da Marco?		X X	
7.	In quale foto Marco spinge la sedia?			X X
8.	In quale foto Marco è sentito?	X X		
9.	In quale foto Marco viene spinto da Sara?		X X	
10.	In quale foto Sara viene imboccata?			X X
11.	In quale foto Sara viene amata?	X		X
12.	In quale foto Marco è annusato?		X X	
13.	In quale foto Sara ama l'orsacchiotto?			X X
14.	In quale foto Sara viene colpita da Marco?		X X	
15.	In quale foto Sara è presa a calci?			X X
16.	In quale foto Marco viene visto da Sara?		X X	
17.	In quale foto Sara è amata da Marco?	X	X	
18.	In quale foto Marco è spinto?			X X
19.	In quale foto Sara bacia il cane?		X X	
20.	In quale foto Marco è baciato da Sara?	X X		
21.	In quale foto Marco è visto?			X X
22.	In quale foto Sara viene amata da Marco?	X X		
23.	In quale foto Sara è inseguita da Marco?		X X	
24	In quale foto Sara annusa il fiore?	X X		

25.	In quale foto Sara è colpita?			X X
26.	In quale foto Marco è sentito da Sara?		X	X
27.	In quale foto Marco viene spinto?	X X		
28.	In quale foto Marco insegue la palla?			X X
29.	In quale foto Marco viene baciato da Sara?		X X	
30.	In quale foto Marco viene annusato?			X X
31.	In quale foto Sara viene colpita?			X X
32.	In quale foto Marco sente la radio?		X X	
33.	In quale foto Sara viene inseguita da Marco?		X X	
34.	In quale foto Sara è amata?	X X		
35.	In quale foto Marco viene visto?			X X
36.	In quale foto Sara è imboccata da Marco?		X X	
37.	In quale foto Marco è baciato?	X X		
38.	In quale foto Marco viene sentito?		X	X
39.	In quale foto Sara imbocca la bambola?		X X	
40.	In quale foto Sara è presa a calci da Marco?	X X		
41.	In quale foto Sara è inseguita?	X X		
42.	In quale foto Marco viene sentito da Sara?	X	X	
43.	In quale foto Sara guarda la palla?	X X		
44.	In quale foto Sara viene imboccata da Marco?			X X
45.	In quale foto Marco viene baciato?		X X	
46.	In quale foto Marco è annusato da Sara?	X X		
47.	In quale foto Marco prende a calci il cuscino?	X X		
48.	In quale foto Sara viene presa a calci da Marco?			X X
49	In quale foto Sara viene inseguita?	X X		
50.	In quale foto Marco viene annusato da Sara?		X X	

X= correct response   X= child's answer

Results in September 2014

TEST DI COMPRENSIONE FRASI PASSIVE				
NOME	**STEFANO**			
	Frasi	**Foto 1**	**Foto 2**	**Foto 3**
1.	In quale foto Marco è spinto da Sara?	X X		
2.	In quale foto Sara è imboccata?		X X	
3.	In quale foto Marco colpisce la sedia?	X X		
4.	In quale foto Marco è visto da Sara?	X X		
5.	In quale foto Sara viene presa a calci			X X
6.	In quale foto Sara è colpita da Marco?		X X	
7.	In quale foto Marco spinge la sedia?			X X
8.	In quale foto Marco è sentito?	X X		
9.	In quale foto Marco viene spinto da Sara?		X X	
10.	In quale foto Sara viene imboccata?			X X
11.	In quale foto Sara viene amata?	X		X
12.	In quale foto Marco è annusato?		X X	
13.	In quale foto Sara ama l'orsacchiotto?			X X
14.	In quale foto Sara viene colpita da Marco?		X X	
15.	In quale foto Sara è presa a calci?			X X
16.	In quale foto Marco viene visto da Sara?		X X	
17.	In quale foto Sara è amata da Marco?	X X		
18.	In quale foto Marco è spinto?			X X
19.	In quale foto Sara bacia il cane?		X X	
20.	In quale foto Marco è baciato da Sara?	X X		
21.	In quale foto Marco è visto?			X X
22.	In quale foto Sara viene amata da Marco?	X X		
23.	In quale foto Sara è inseguita da Marco?		X X	
24	In quale foto Sara annusa il fiore?	X X		
25.	In quale foto Sara è colpita?			X X
26.	In quale foto Marco è sentito da Sara?			X X
27.	In quale foto Marco viene spinto?	X X		

28.	In quale foto Marco insegue la palla?			X X
29.	In quale foto Marco viene baciato da Sara?		X X	
30.	In quale foto Marco viene annusato?			X X
31.	In quale foto Sara viene colpita?			X X
32.	In quale foto Marco sente la radio?		X X	
33.	In quale foto Sara viene inseguita da Marco?		X X	
34.	In quale foto Sara è amata?	X X		
35.	In quale foto Marco viene visto?			X X
36.	In quale foto Sara è imboccata da Marco?		X X	
37.	In quale foto Marco è baciato?	X X		
38.	In quale foto Marco viene sentito?			X X
39.	In quale foto Sara imbocca la bambola?		X X	
40.	In quale foto Sara è presa a calci da Marco?	X X		
41.	In quale foto Sara è inseguita?	X X		
42.	In quale foto Marco viene sentito da Sara?		X X	
43.	In quale foto Sara guarda la palla?	X X		
44.	In quale foto Sara viene imboccata da Marco?			X X
45.	In quale foto Marco viene baciato?		X X	
46.	In quale foto Marco è annusato da Sara?	X X		
47.	In quale foto Marco prende a calci il cuscino?	X X		
48.	In quale foto Sara viene presa a calci da Marco?			X X
49	In quale foto Sara viene inseguita?	X X		
50.	In quale foto Marco viene annusato da Sara?		X X	

X= correct response

X= child's answer

APPENDIX G: THE RESULTS OF THE PRODUCTION TASK

SUBJECT RELATIVE CLAUSES:

1) Mi piace il coniglio che disegna gli uccellini / le farfalle

   Quello che disegna gli uccellini

2) Mi piace la mamma che abbraccia / bacia le bambine

   Io quella che abbraccia le bambine

3) Mi piace il dottore che saluta / visita le nonne

   Mi piace il dottore che saluta le donne

4) Mi piace il vigile che ferma i cani / i leoni

   Mi piace il vigile che ferma i leoni

5) Mi piace l'orso che insegue i leoni / i gatti

   L'orso che insegue i gatti

6) Mi piace la bambina che guarda / saluta i cavalli

   Mi piace la bambina che guarda i cavalli

7) Mi piace la bambina che prende le api / le farfalle

   Mi piace la bambina che prende le api

8) Mi piace la maestra che sgrida / premia i bambini

   Mi piace che la maestra premia i bambini

9) Mi piace il bambino che saluta le mucche / i cani

   Mi piace il bambino che saluta i cani

10) Mi piace il papà che sporca i bambini / i topi

   Mi piace il papà che sporca i topi

11) Mi piace il papà che sgrida / bacia i gatti

   Mi piace il papà che sgrida i gatti

12) Mi piace il leone che insegue/tira i bambini

   Mi piace il leone che sta correndo addosso ai bambini

OBJECT RELATIVE CLAUSE:

1) Mi piace il cane che i papà lavano /sporcano

Quelli che sporcano il cane

2) Mi piace la bambina che baciano i nonni / i cani

Mi piace la bambina che viene baciata dai cani

3) Mi piace la maestra che i vigili fermano / salutano

Quelli che fermano la maestra

4) Mi piace il cavallo che toccano le scimmie / i topi

Mi piace il cavallo che viene toccato dai topi

5) Mi piace l'elefante che sollevano le mamme / i papà

Mi piace l'elefante che viene sollevato dal papà

6) Mi piace il bambino che gli orsi mordono / accarezzano

Mi piace il bambino che viene morso dagli orsi

7) Mi piace l'elefante che i nonni sollevano / guardano

Mi piace l'elefante che viene guardato dai nonni

8) Mi piace il cane che pettinano i bambini / i barbieri

Mi piace di più il cane che viene pettinato dai barbieri

9) Mi piace la tigre che vedono i bambini/i gatti

Mi piace la tigre che viene guardata dai gatti

10) Mi piace il vigile che i cani mordono/inseguono

Mi piace il vigile che viene inseguito dai cani

11) Mi piace la scimmia che guardano i gatti/i bambini

Mi piace la scimmia che viene guardata dai gatti

12) Mi piace il gatto che i bambini accarezzano/mandano via

Mi piace il gatto che viene scacciato dai bambini

PASSIVE CLAUSES:

1) I cani vengono accarezzati

      Un bambino tocca i cani

2) il bambino viene pizzicato

      Si dà un pizzicotto

3) il bambino viene morso

      Un cane l'ha morso

4) la maestra viene baciata

      Una bambina gli dà un bacio

5) il gatto viene bagnato/spruzzato

      Qualcuno lo bagna

6) la mamma viene stesa/appesa

      Si è appesa

7) il papà viene fotografato

      Si fa una foto

8) la bambina viene sgridata

      La bambina viene sgridata dalla maestra

9) il topo viene pettinato

      Il gatto pettina il topo

10) la bambina viene graffiata

      Un leone la graffia

11) l'oca viene strozzata

      L'oca si fa strangolare da un bambino

12) il bambino viene pescato

      Qualcuno lo manda giu

Black sentences = TARGET

Red Sentences = Child's Answer