

RESUMPTIVE RELATIVES AND PASSIVE RELATIVES IN ITALIAN COCHLEAR-IMPLANTED AND NORMAL HEARING CHILDREN

1. Introduction

This study investigates two answering strategies (namely object relatives with resumptive elements and passive relatives) provided by a group of hearing-impaired children using a cochlear implant (CI children, henceforth) and two normal hearing control groups in a production task aimed at eliciting object relatives.

Hearing impairment is a sensory impairment affecting the natural acquisition of an oral language. Language development is delayed in both children wearing conventional hearing aids (Caselli et al., 1994; De Villiers et al., 1994) and children fitted with a cochlear implant (Szagun, 2001; Geers et al., 2009; Hammer, 2010; Volpato, 2010; Caselli et al., 2012; Volpato & Vernice, 2014). In CI children, a high variability of performance was observed, some of them showing linguistic abilities comparable to those of normal hearing age peers (Szagun, 2001; Geers et al., 2009; Volpato & Vernice, 2014). However, the acquisition of complex constructions such as relative clauses was found to be impaired in CI individuals (e.g. Friedmann & Sztermann, 2006; Volpato, 2010).

Much cross-linguistic research has been carried out on the production of relative clauses. All studies found a marked asymmetry between subject (SRs) and object relatives (ORs). Whereas SRs are correctly produced, ORs are problematic and are mainly avoided through the use of a number of different strategies (Belletti & Contemori, 2010; Contemori & Belletti, 2013; Guasti & Cardinaletti, 2003; Novogrodsky & Friedmann, 2006; Volpato 2010; Volpato & Vernice, 2014). As for Italian, Re (2010) found that the percentage of ORs produced by young typically-developing children (age range: 4;10-5;10) is low (21%). It increases at the age of 6 till the age of 8 (32%), and starts decreasing at the age of 9-10 years reaching the rate of 7%. In adolescents and adults, this structure is no longer found (Volpato, 2010; Carpenedo, 2011) (for similar findings in other studies on the acquisition of Italian, see Utzeri, 2007; Belletti & Contemori, 2010).

When producing ORs, children often add a resumptive element, either

a pronoun or a DP, resuming the head of the relative clause. The use of resumptive pronouns in relative clauses is frequent in children speaking a number of different languages (Hebrew, Greek, French, Spanish, and Italian). In some cases, this strategy is found in the adult language as well (Greek, Romanian, and Hebrew), in others, it is limited to children's productions or found only in the spoken colloquial register (for Italian, Guasti & Cardinaletti, 2003; Utzeri, 2007; Volpato & Vernice, 2014; for French, Labelle 1990; Guasti & Cardinaletti, 2003; for English, De Villiers, 1988; Pérez-Leroux 1995; McDaniel et al. 1998; for Spanish, Ferreiro et al., 1976).

In addition to ORs containing resumptive pronouns, Italian children produce ORs containing resumptive DPs (Utzeri, 2007; Volpato & Vernice, 2014). Although this strategy is not grammatical in Italian, ORs with resumptive DPs are found in many adult languages (e.g., Papuan, Niger-Congo, Austronesian, and Chadic). Cinque (2011) refers to these ORs as *double-headed* relatives.

The production of relative clauses has been extensively investigated also in individuals with hearing impairment (for English see Berent, 1988; De Villiers, 1998; Quigley & Paul, 1984; for French, Delage, 2008; Delage & Tuller 2010; for Hebrew, Friedmann & Szterman, 2006, 2011; Friedmann et al., 2008; for Palestinian Arabic, Friedmann & Costa, 2011; for Italian, Volpato & Vernice, 2014). The asymmetry between subject and object relatives is confirmed for hearing-impaired individuals either wearing conventional hearing aids or a cochlear implant. Hearing-impaired individuals show a lower percentage of accuracy than normal hearing subjects even in the production of SRs. In the elicitation of ORs, hearing-impaired individuals tend to use a number of different strategies differentiating their performance from that of normal hearing children, namely the production of ungrammatical sentences (for Hebrew, Friedmann & Szterman, 2006; for French, Delage, 2008; for Italian, Volpato & Vernice, 2014) or sentences containing locative pronouns replacing the complementizer (Delage, 2008; Volpato & Vernice 2014).

They also produce object relative clauses with resumptive pronouns and DPs. According to Friedmann et al. (2008), the use of resumptive elements shows that hearing-impaired individuals have difficulties in accessing syntactic movement and/or an impairment in the PF component.

Another strategy which is appropriate when a target object relative is elicited consists in the use of passive relative clauses (PORs, Belletti 2009), namely subject relatives containing a passive (*Il bambino che è baciato dal cane* 'The child that is kissed by the dog'). Whereas ORs are largely produced by young children, but tend to decrease as children grow

older and are nearly absent in adults, PORs show low percentages of occurrence at the age of 5. They considerably increase in children aged 6 to 11 and become the prevailing strategy in adulthood (Utzeri, 2007; Belletti, 2009; Belletti & Contemori, 2010; Re, 2010; Volpato, 2010; Carpenedo, 2011; Belletti & Rizzi, 2013).

The use of PORs raises the issue of the acquisition of the passive voice. Early studies dating back to the eighties (Borer & Wexler, 1987) claimed that children are not able to produce and comprehend verbal passives until they are 5 or 6 years old, their grammar only allowing the formation of adjectival passives, which lack the *by*-phrase. Other studies however found that passives with an eventive interpretation are available from the age of 3-4 years (e.g. Pinker et al., 1987; O'Brien et al., 2005; Demuth et al., 2010; Manetti, 2013; Volpato et al., 2013; 2014; Belletti & Manetti, this volume).

When investigating the passive voice in Italian, a specific property is worth considering, namely the fact that passive sentences can be built with two auxiliaries, *essere* or *venire*. A sentence with *essere* (*La porta è chiusa* 'The door is closed') is ambiguous between a stative, resultative, and eventive reading, since the word *chiusa* can be either an adjective or a verb. To get an unambiguously eventive reading, it is necessary to use the auxiliary *venire* (*La porta viene chiusa*, Lit. The door comes closed 'The door is closed'), which can only cooccur with a verb. The use of this specific property was studied in previous work (Volpato et al., 2013, 2014) investigating the comprehension and production of passive sentences in Italian young typically-developing children. Results showed that in Italian, the syntax behind passives is available to children aged 3;5 to 6;0 since they correctly comprehend and produce passive sentences with the auxiliary *venire*.

As for the acquisition of passive sentences by hearing-impaired children, few data are available. Franceschini (2013) carried out a study on two Italian hearing-impaired twins tested in 2011, at the age of 7;6, and in 2013, at the age of 9;0. These children never produced passive sentences, adopting a number of different strategies instead in order to avoid the passive construction.

This study aims at investigating the use of object relatives with resumptive elements and the use of passive relatives in order to determine whether and to what extent Italian CI children differ from normal hearing children, taking into consideration both the group performance and the inter-subject variability which is very often found in hearing-impaired individuals.

2. The experiment

2.1 Participants

Three groups took part in this study (also see Volpato & Vernice, 2014).

The experimental group was composed of 13 children with profound hearing impairment using a cochlear implant (CI group) and ranging in age from 7;9 to 10;8 (M: 9;2; SD: 0;11). All children have been hearing-impaired since birth. Neither of their parents was hearing impaired. They were fitted with hearing aids between the age of 0;5 and 1;8 and received a cochlear implant between the age of 1;9 and 3;4. The duration of use of the cochlear implant varied from 4;5 to 8;6. All children were trained orally, and none of them used any sign language.

The experimental group was compared to two groups of normal hearing children. The first hearing group included 13 children of comparable linguistic age (LA group) ranging in age from 5;10 to 7;9 (M 6;11 SD; 0;9). Each CI child was individually matched to a hearing child on the basis of the scores obtained on a standardized test assessing general morpho-syntactic abilities (TCGB – Test di Comprensione Grammaticale per Bambini, Chilosi & Cipriani 2006). The second hearing group included 13 children ranging in age from 7;5 to 10;3 (M:9;1; SD 1;1) and matched to the hearing-impaired group on the basis of chronological age (CA group). All hearing children had normal language development and did not have any hearing or mental disabilities. They were recruited in a kindergarten and two primary schools near Venice.

2.2 Materials

Elicited production of relative clauses was assessed by using a preference task (Volpato, 2010; Volpato & Vernice, 2014), following the models proposed by Friedmann & Szterman (2006) and Utzeri (2007). Children were shown two pictures and asked to express a preference between the two options, thus being forced to produce a relative clause.

The stimuli investigating object relatives were 12.¹ All stimuli were built with reversible transitive verbs and animate objects. They included ORs with a change of the agent, forcing the production of a *by*-phrase if a passive relative is produced, as Figure 1 and (1) show:

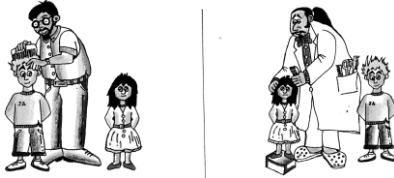


Figure 1: An item displaying the change of agent.

- (1) Ci sono 2 disegni. Nel primo, il papà pettina i bambini. Nel secondo, il barbiere pettina i bambini. Quali bambini ti piacciono?

Target: I bambini che il papà / barbiere pettina.

I bambini che sono pettinati dal papà/barbiere.

There are two pictures. In the former, the father combs the children. In the latter, the barber combs the children. Which children do you like?

Target: *The children that the father/barber combs.*

The children that are combed by the father/barber.

The battery also included ORs with a change of the verb, in which the presence of a *by*-phrase in the passive relative is optional, as Figure 2 and (2) show:

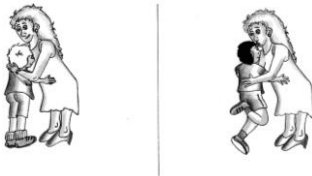


Figure 2: An item displaying the change of verb.

- (2) Ci sono 2 disegni. Nel primo, la mamma abbraccia un bambino. Nel secondo la mamma bacia un bambino. Quale bambino ti piace?

Target: Il bambino che la mamma abbraccia/bacia.

Il bambino che è abbracciato/baciato (dalla mamma).

There are two pictures. In the former, the mother hugs the child. In the latter, the mother kisses the child. Which child do you like?

Target: *The child that the mother hugs/kisses.*

The child that is hugged/kissed (by the mother).

Both CI and normal hearing children were assessed through the oral modality in one or two sessions. CI children were tested during their speech therapy sessions, while normal hearing children were assessed at their kindergartens or primary schools.

2.3 Results: the use of object relatives and passive relatives

The participants produced three types of ORs: target ORs with gap (*I bambini che il papà pettina* ‘The children that the father combs’), ORs with resumptive clitic pronouns (*Il bambino che l’orso lo accarezza* ‘The child that the bear caresses him’), and ORs with resumptive DPs (*Il bambino che l’orso accarezza il bambino* ‘The child that the bear caresses the child’). In addition, they produced subject relatives with a passive. The following table shows the percentages of ORs and PORs produced by each group out of the expected 156 ORs (cf. Volpato & Vernice, 2014).²

	Cochlear-implemented (CI) group		Language age (LA) group		Chronological age (CA) group	
	No.	%	No.	%	No.	%
Target ORs	10	6%	22	14%	21	15%
ORs with resumptive clitic pronouns	15	10%	24	15%	2	1%
ORs with resumptive DPs	11	7%	6	4%	0	0%
PORs	41	26%	22	14%	65	42%

Table 1: Percentage of object relatives (target ORs, with resumptive clitic pronouns, and with resumptive DPs), and passive relatives (PORs) produced by each group.

The hearing LA group produced in all more ORs than PORs, whereas the CA group showed the reversed pattern, namely the percentage of PORs is higher than that of ORs. The CI group holds at an intermediate position between the two hearing groups for both answering strategies. The following table shows the percentage of distribution of the three types of object relatives across the three groups of participants:

	Cochlear-implemented (CI) group		Language age (LA) group		Chronological age (CA) group	
	No.	%	No.	%	No.	%
Target ORs	10/36	28%	22/52	42%	21/23	91%
ORs with resumptive clitic pronouns	15/36	42%	24/52	46%	2/23	9%
ORs with resumptive DPs	11/36	31%	6/52	12%	0/23	0%

Table 2: Distribution of the three strategies across the three groups of

participants (% taken out of only ORs)

The older children (CA group) tend to produce more target ORs than CI and LA children. The CI and LA group produced a considerable amount of ORs with resumptive clitic pronouns, whereas the CA group produced relatively few of those. Differently from the hearing groups, the CI group also produced a high percentage of ORs resuming the head DP.

As shown in Table 1, all groups produced PORs. Table 3 shows the type of auxiliary used by each group:

	CI		LA		CA	
<i>Essere</i>	12/41	29%	8/22	36%	9/65	14%
<i>Venire</i>	18/41	44%	13/22	59%	52/65	80%
Reduced	11/41	27%	1/22	5%	4/65	6%

Table 3: Type of auxiliary used in the production of passive relatives.

All groups used both *essere* and *venire*. However, they largely prefer producing passives with auxiliary *venire*. Some passives were also produced in the reduced form (i.e., the complementizer and the auxiliary verb were missing – *I bambini pettinati dal barbiere* ‘the children combed by the barber’). Even though the *by*-phrase was not necessary in all PORs, all groups showed a strong preference for its use. The rate of production of the *by*-phrase was 93% for the CI group, 86% for the LA group, 95% for the CA group.

As seen in Table 1, in the production of ORs and PORs, the CI group holds an intermediate position between the two hearing control groups. This result can be understood in terms of inter-subject variability, as Table 4 shows:

ID	Age	OR (gap) No.	OR + RP No.	OR+ RDP No.	PR No.
S1	8;10	2		3	
S2	8;1				10
S3	8;2	2			1
S4	9;5				
S5	9;6	3	5	1	
S6	9;3				12
S7	9;6				11
S8	9;9	1		5	

S9	9;10	1	9		
S10	9;6			1	7
S11	7;9		1		
S12	10;8				
S13	7;11	1		1	

Table 4: Number of object relatives and passive relatives produced by each cochlear-implanted child (OR-gap: target object relatives; OR+RP: object relatives with resumptive clitic pronouns; OR+RDP: object relatives with resumptive DPs; PR: passive relatives).

CI children producing ORs never or rarely produced PORs, and in CI children largely producing PORs, ORs are nearly absent. Note that age is not a predictor for the inter-subject variability observed.

3. Discussion and conclusion

This study investigates the ORs and PORs produced by a group of CI children and two groups of normal hearing children using an elicited production task. Results showed that all groups produced ORs to some extent. Most interestingly, the CI group produced many ORs with resumptive DPs (31% out of the ORs produced, see Table 2). Moreover, CI children and hearing LA children prefer producing ORs containing resumptive clitic pronouns.

The use of resumptive pronouns was also observed by Friedmann et al. (2008) for Hebrew: Hearing-impaired children produced a higher percentage of ORs containing resumptive pronouns than normal hearing children (42% vs. 30%).³ Since Friedmann et al. (2008) take resumptive pronouns to occur in no-movement structures, they conclude that syntactic movement is impaired in hearing-impaired children.

In Italian, results are different, however. First, the percentage of occurrence of ORs with resumptive pronouns is very similar in the CI children and the hearing LA group (42% and 46%, respectively, out of all ORs produced, see Table 2).⁴ We believe that it is not possible to propose that normal-hearing children do not have access to syntactic movement (*pace* Labelle, 1990, 1996): a learnability problem would arise. Furthermore, there is empirical evidence that the relative clauses produced by children are derived by movement (Guasti & Shlonsky, 1995; Guasti et al., 1997). Second, while resumptive pronouns are strong in Hebrew, they are clitic in Italian. They should therefore be analysed on a par with resumptive clitic pronouns in e.g. Palestinian Arabic, for which Friedmann

& Costa (2011) do assume movement. These data suggest that Friedmann et al.'s (2008) proposal cannot be adopted for Italian hearing-impaired children. In other words, the production of ORs with resumptive clitic pronouns does not mean that the CI children in our study do not have access to syntactic movement. Rather, they can be taken to use a grammatical option typical of the spoken, colloquial register of Italian (Guasti & Cardinaletti, 2003). Note also that the analysis of ORs with resumptive pronouns has recently been much debated: they have been analysed as movement, doubling structures (Boeckx, 2003) or long-distance agree relations (Adger & Ramchand, 2005). Whatever analysis turns out to be correct for ORs with resumptive pronouns, it can be adopted for both Italian CI children and the control groups. As children grow older and get more acquainted with the formal registers of the language, they tend to get rid of this possibility, which is kept in the Italian very colloquial register.

As for the use of ORs with resumptive DPs, in the hearing groups, this structure is only found in very few occurrences in the youngest children (LA: 13%; CA: 0%). This phenomenon is also observed in Hebrew hearing-impaired children, but is absent in normal hearing children (7% vs. 0%) (Friedmann & Szterman, 2006). Friedmann et al. (2008) proposed that in Hebrew hearing-impaired children, the first merge copy of the head DP is spelled-out because the PF component is impaired. Note that 13% of the ORs produced by Italian LA control children contained resumptive DPs, and we would be very reluctant to conclude that these control children are impaired in their PF component. As observed in section 1, ORs with resumptive DPs ("*double headed*" relative clauses) are found in many adult languages: Papuan, Niger-Congo, Austronesian, Chadic. Cinque (2011) claimed that a copy theory approach for double headed relatives is "dubious" since the first merge copy is not pronounced in other movement cases (e.g. *wh*-questions, topicalizations, and free relatives). Whatever the correct analysis of double-headed relatives, it is clear that Italian CI children, like younger normal-hearing controls, make use of a UG possibility. We suggest that children make use of a larger spectrum of relative clauses than those targeted, a proposal compatible with a learning-by-forgetting approach to language acquisition. Of the many possibilities made available by UG, children have to "forget" those which turn out to be inconsistent with their language experience. The higher presence of this structure in CI children than in hearing controls may be a sign of the language delay due to hearing impairment. Since their language experience starts later than normal-hearing children and is quantitatively and qualitatively more limited, it very probably takes more time for them

to establish the possibilities attested in the target language. Some of the CI children indeed behave like younger hearing children. As a matter of fact, resumptive DPs have been produced by the youngest children in the LA control group. In conclusion, the production of ORs with resumptive elements does not lead us to conclude that the CI children in our study have problems with syntactic movement and/or in the PF component.

In addition to object relatives, both CI and normal hearing children produced PORs, which were grammatical answers appropriate in the context. Table 1 showed that the tendency to produce more PORs than ORs, as expected, is higher in the group of older hearing children (CA group: 42% vs. LA group: 14%). CI children hold an intermediate position between the LA group and the CA group (26%). This intermediate result can be attributed to inter-subject variability.

For the normal hearing group, the presence of passive relatives is not surprising, since Italian typically-developing children produce passive sentences with the auxiliary *venire*, which conveys an eventive interpretation, before the age of four (Volpato et al., 2014). Results show that the passive voice is correctly produced by some CI children, passive relatives being produced in most cases with the auxiliary *venire* (44%). This conclusion is strengthened by the observation that some passives built with the auxiliary *essere* were followed by the *by*-phrase, for which only an eventive reading is possible. Even though we observed redundancy in the use of the *by*-phrase, which was not always required by the context, the production of this element confirms that the passives uttered by CI children are true verbal passives. The use of passive relatives in the group of CI children shows that some of these participants have attained a good competence of passive sentences.

In conclusion, in the CI group, we have observed inter-subject variability in the production of ORs (with gap and resumptive elements) and PORs. Indeed, the children who used the former strategy, never (or rarely) used the latter, and vice-versa. In the control groups, ORs decrease with age, while PORs increase, replicating previous results. The higher percentage of PORs as opposed to ORs in some of the CI children is probably linked to the good cognitive and linguistic development attained, which is consistent with their chronological age. Their target use of PORs also shows that CI children have attained a good competence of the passive voice. The use of ORs with resumptive elements (especially resumptive DPs) by some of the CI children is instead a sign of the linguistic delay often associated to hearing impairment. We suggest that they make use of a large spectrum of UG possibilities for a longer period than normal-hearing age peers because it takes more time for them to set

the parameters of the target language. They indeed behave like younger hearing children.

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¹ In addition to object relatives, the task also included the elicitation of 12 subject relatives. In this paper, we focus on object relatives. For data and analysis of subject relatives, see Volpato & Vernice (2014).

² In addition to object relatives and passive relatives, the children produced a number of other strategies (Volpato & Vernice, 2014). Normal hearing children largely produced causative constructions (*Il bambino che si fa pettinare dal papà* ‘The child that has himself combed by the father’), which were rarely produced by CI children. A strategy which is only used by CI children is the production of wh-fillers (*dove* ‘where’) replacing the complementizer (*Mi piace il bambino quello dove il papà lava* ‘I like the child the one where the father washes’). Other strategies that are only found in the CI group’s productions include the use of sentences in which the complementizer is omitted (*Mi piace il bambino ... il dottore guarda* ‘I like the child ... the doctor looks at’) and the production of ungrammatical sentences (*Mi piace il bambino così cammina e così il cane insegua* ‘I like the child so walks and so the dog follow.Subj.Mood’). The group of younger normal hearing children (LA group) transformed object relatives into subject relatives by turning the embedded subject into the relative head (*Il papà che pettina i bambini* ‘The father that combs the children’). This strategy is less frequent in the CI and CA groups. The group of CI children also produced sentences with theta-role inversion, namely subject relatives in which the head becomes the embedded subject (*I bambini che baciano il cane* ‘the children that kiss the dog’ instead of ‘The children that the dogs kiss’) and simple SVO sentences (*Il papà pettina i bambini* ‘the father combs the children’). These strategies are rare in hearing children.

³ Friedmann et al. (2008) found that hearing-impaired children also produced resumptive pronouns in subject relatives, thus producing ungrammatical sentences. This phenomenon was never observed in Italian CI children (Volpato & Vernice, 2014).

⁴ Since CI children produce less ORs than the LA group, the absolute percentage of ORs with resumptive pronouns is lower in the CI group than in the LA group.