The treatment of relative clauses through the explicit teaching of syntactic properties: two pilot studies on Italian cochlear-implanted children

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1 Introduction

Hearing impaired children show delayed and atypical comprehension and production of syntactically complex structures, such as relative clauses (Volpato & Adani, 2009; Volpato, 2010, 2012; Volpato & Vernice, 2014).

Relative clauses are subordinate clauses derived by WH-movement (Chomsky, 1995) which are acquired at different stages of language acquisition (Guasti, 2002; Utzeri, 2007; Volpato, 2010; Belletti & Guasti, 2015). For this study we analysed three types of relative clauses: subject relative clauses SRs (1a), object relative clauses with a preverbal embedded subject ORs (1b) and object relative clauses with a postverbal embedded subject ORps (1c), which distinguish themselves on the basis of which grammatical role the head of the relative clause has within the embedded clause.

(1) a. Mi piace il bambino che [<il bambino> pettina i cavalli]
I like the child that ___ combs the horses
b. Mi piace il bambino che [i cavalli pettinano <il bambino>]
I like the child that the horses comb ___
c. Mi piace il bambino che [pettinano i cavalli <il bambino>]
I like the child that comb the horses ___

In the examples in (1), the NP *il bambino* 'the child' is pronounced in a position that is different from the one in which it is interpreted with respect to the embedded verb. In (1a) *il bambino* is interpreted as the subject of *pettina* 'combs', whereas in (1b) and (1c) *il bambino* is interpreted as the object of *pettinano* 'comb'. The processing of these structures is characterized by clear asymmetries: SRs are easier than ORs and ORps; and ORs are easier than ORps.

Such asymmetries are much evident in the populations with language impairments such as children with Specific Language Impairment (SLI), agrammatic aphasics, and hearing-impaired children, even though they are also observed in (young) typically developing populations.

Previous studies have shown that it is possible to rehabilitate complex structures, such as relative clauses, through the explicit teaching of syntactic movement (Thompson & Shapiro, 1995; Levy & Friedmann, 2009). Following these studies, our study aims at applying the same strategy to two Italian-speaking cochlear-implanted (CI) children, who showed an impaired production and comprehension of relative clauses.

2 The experiment

The participants at this study are: S1, a boy aged 8;5, and S2, a girl aged 10;5. Both participants suffer from profound sensorineural hearing loss and are fitted with a CI[23]. They were born from hearing families, followed a speech therapy, and they do not use any sign language. They were selected and tested at the Ear Nose Throat Clinic Department of Neurosciences of the University of Padua (ENT Clinic, henceforth), where they passed a screening test for hearing and audio-perceptual tests, administered by a speech therapist.

[23] They received a CI at different ages. LB received his CI at the age of 2;7. ES received her CI at the age of 8;4.

We analysed the production and comprehension of relative clauses with two tests developed by Volpato (2010). The production of relative clauses was assessed with an elicited production task, while the comprehension of these structures was analysed with an agent selection task.

The results before the treatment showed for both children the typical asymmetry between SRs and ORs. More in detail, S1 showed an absent production of ORs, and S2 showed an impaired comprehension of SRs and ORps.

Given their difficulties with relative clauses, they were selected for a treatment approach based on the explicit teaching of the syntactic movement. However, the two interventions have different purposes: The intervention on S1 tested the efficacy of the explicit teaching of syntactic theory on a CI child and the duration over time of its effects, while the intervention on S2 examined generalization effects to untrained sentences derived from the same type of syntactic movement. In addition, generalization effects on narrative skills were also considered.

The treatment based on the explicit teaching of syntactic movement includes three stages. The first stage is focused on Verb argument structure[24] and Theta Criterion[25], in order to turn LB's implicit knowledge into explicit knowledge, which could be used as a support during the explanation of WH-movement (as in Levy & Friedmann, 2009). The second stage of the treatment aims at teaching the syntactic movement through a card game, which enabled the children to see and touch the syntactic movement. The third session comprised the review of the topics taught during the previous sessions.

The results collected after the treatment showed the participants' improvement for both tasks and in each sentence type assessed. The effects were maintained also several months after the end of the treatment.

3 Conclusion

We analysed the production and comprehension of relative clauses in two Italian-speaking CI children, in order to analyse whether a delay in the processing of these structures exists and whether it is possible to rehabilitate relative clauses through the explicit teaching of syntactic movement.

Before the treatment, the participants at our study showed an impaired production and comprehension of relative clauses. After the treatment and also several months after its completion, the participants showed an improvement for all the structures assessed. Therefore, the treatment based on the explicit teaching of syntactic theories is feasible also in CI children.

Concluding, the reliability of a treatment based on the explicit teaching of syntactic theory was confirmed also for CI children.

Refrerences

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[24] Verb argument structure specifies the number of obligatory arguments the verb requires. Depending on how many arguments the verb can assign, it is possible to distinguish four verb categories: zero argument verbs which take no arguments (*it rains*); intransitive verbs which only take one argument (*laugh*); transitive verbs which take two arguments (*break*); ditransitive verbs which take three arguments (*give*).

[25] The verb assigns to each argument in the sentence one and only one thematic role, which determines the semantic relationship between the verb and its arguments.

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