The comprehension of relative clauses in Italian children with SLI and in Italian children with DD

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Recent work has shown that the comprehension of passive relative clauses (P-RCs) like (1) is less challenging than the comprehension of object relative clauses (O-RCs) like (2) for Italian monolingual typically developing children (Contemori & Belletti, in press).

P-RC	O-RC
(1) Lo gnomo che è inseguito dalla strega	(2) Lo gnomo che la strega insegue
The dwarf that is chased by-the witch	The dwarf that the witch chases
The dwarf that is chased by the witch	*The dwarf that the witch is chasing*

These results have been explained in a featural approach to Relativized Minimality (Contemori & Belletti, in press; Rizzi, 2004; Friedmann, Belletti, Rizzi, 2009). According to this approach, O-RCs are particularly challenging since the lexical subject ("la strega" *the witch*) intervenes between the lexical head ("lo gnomo" *the dwarf*) and its merge position (the object of the RC verb). In P-RCs this intervention is avoided since, according to a passive derivation via *smuggling* (Collins, 2005), the object is moved together with the verb across the subject position; in this configuration the subject cannot intervene between the RC head and its merge position (the verb internal argument). This explains why P-RCs are less challenging than O-RCs.

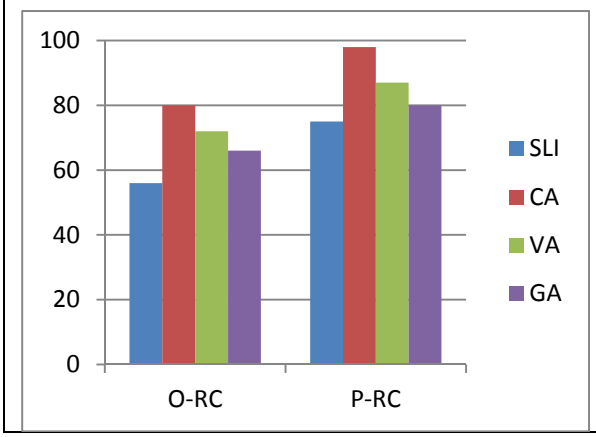
Studies on Specific Language Impairment (SLI) have shown relative clause comprehension to be particularly hard for SLI children. Analogously to typically developing children, they have more difficulties with object relative clause, but to a deeper degree and for a longer period of time, presumably because these structures involve long distance syntactic movement and a non-canonical word order, in addition to intervention effects (Contemori and Garaffa 2010; Håkansson and Hansson 2000; Novogrodsky & Friedmann 2006, a.o.). Although passive comprehension in matrix sentences has been extensively studies in SLI children, to our knowledge, no study has addressed and compared the comprehension of O-RCs and P-RCs in these children. Studies on Developmental Dyslexia (DD) have also shown O-RC comprehension to be challenging for DD children (Wiseheart, 2009 a.o.). To our knowledge, no study has addressed and directly compared the comprehension of O-RCs and P-RCs in DD children.

In our study we investigated the comprehension of O-RCs and P-RCs as in (1) and (2) in 13 school-age Italian monolingual children with SLI (mean age 7,6; range 6,1-10,2), in 13 school-age Italian monolingual children with DD (mean age 10,7; range 8,7-13,3), and in 65 typically developing controls. All children were administrated a picture selection task investigating the comprehension of RCs. They were also tested in the standardised receptive vocabulary test PPVT (Dunn, L.M. & Dunn L.M. (Italian version by Stella, Pizzioli, Tressoldi, 2000)) and in the standardised Raven's Coloured Progressive Matrices test (Raven, Court, & Raven, 1998; Belacchi, Scalisi, Cannoni, Cornoldi, 2008), in order to have a standardised measure of their lexical and non verbal cognitive abilities. In addition, children with SLI were tested in the normreferenced grammar proficiency test TCGB (Chilosi, Cipriani, Giorgi, Fazzi, Pfanner, 1995) in order to have a standardised measure of their grammatical competence. Since the TCGB test loses its sensitivity after age 8 years and in Italian dyslexia is diagnosed as soon as the end of the second grade class, typically after age 8

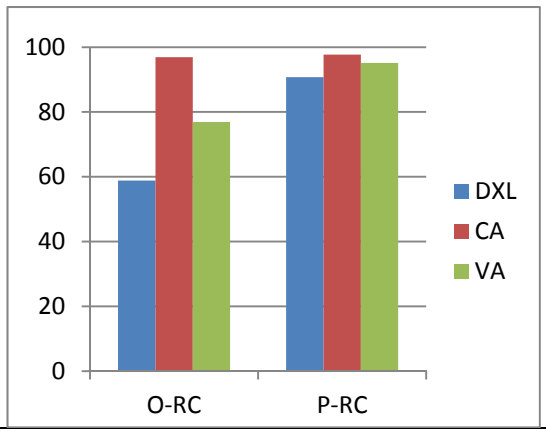
years, we could not administrate the TCGB test to children with dyslexia who participated in our study; no standardised test evaluating grammar proficiency in children older than 8 years was available for Italian at the time of the testing. Children with dyslexia were additionally tested in the standardised proficiency reading test DDE-2 (Sartori, Job, Tressoldi, 2007) including a word reading task and a pseudoword reading task. All children had a nonverbal IQ >85 at Raven's test.

Accuracy at RC comprehension in children with SLI, with DD and their controls is represented in picture 1 and picture 2. We carried out a number of repeated measure logistic regression analyses in a mixed model using a backwards elimination procedure to compare the goodness of fit of the models (Baayen, 2008). All statistical analyses were conducted using R.

Picture1: accuracy at RC comprehension in children with SLI and their controls



Picture2: accuracy at RC comprehension in children with dyslexia and their controls



Concerning SLI children and their control groups, we found an effect of GROUP ($p<0.001$), of RC-TYPE ($p<0.001$) and an interaction between the two factors ($p<0.001$). SLI children were different from all control groups in the comprehension of O-RCs ($p<0.001$ in each comparison); in the comprehension of P-RCs, they were different from children of the same chronological age (CA) ($p<0.001$) and children of the same receptive vocabulary (GA) ($p<0.001$), but not from younger children of the same grammatical age (GA). Concerning DD children and their control groups we found an effect of GROUP ($p<0.001$), of RC-TYPE ($p<0.001$) and an interaction between the two factors ($p=0.03$). DD children were different from CAs and VAs in the comprehension of O-RCs ($p<0.001$ in each comparison). No differences were observed in the comprehension of P-RCs.

Our data suggest that intervention is an additional factor of complexity for RC comprehension for both SLIs and DDs and that, although intervention effects are avoided in P-RC, these structures are still challenging for SLIs, probably because they feature a long distance syntactic movement and a non-canonical word order. Our results are compatible with theories that sees SLI as a deficit in the processing of complex aspects of language. Interestingly, children with DD were different from their CA and VA controls in the comprehension of O-RCs. This suggests that at least a subgroup of the DDs has more problems than typically developing children in achieving complex syntactic operations involving intervention effects, although they are diagnosed as not having a SLI.