Comprehension of relatives vs. control structures in SLI and ASD children

Introduction & goals: Some studies have suggested similarities in the linguistic profiles of children diagnosed with Specific Language Impairment (SLI) and certain children diagnosed with Autism Spectrum Disorders (ASD), justifying a growing interest in the comparison of the two populations ([8], a.o.). The idea that low results with object relatives, which involve intervention effects in A'-movement structures, may signal syntactic impairment has been largely discussed ([3], also [2]; [1] for EP). However, less is known about the performance of ASD children with the same structure (but see Durrleman et al. 2014). Another even more understudied area is the comprehension of control by impaired populations. An exception is [5], who suggest general mastery of binding and control (with the exception of *promise* structures) in high-functioning ASD, in contrast with problems with A-movement. This is a timely issue in light of current developments of syntactic theory: if control is taken as A-movement ([4]) and intervention effects are found in structures involving A-movement ([6]), parallel difficulties may be expected in object relatives and in subject control with *promise*-type verbs, which could be similarly interpreted as cases of intervention. We thus aim at comparing the results of both SLI and ASD populations in the comprehension of relative clauses and complement clauses involving obligatory control, in order to discuss the nature of the impairment as well as the nature of the difficulty presented by each type of syntactic structure.

Method: We tested 11 SLI children (8 to 11 years) and 11 high-functioning ASD children (8 to 11 years), as well as a group of 82 typically developing (TD) children (3 to 11 years) on 2 different tasks: an act-out task and a reference judgment task. The structures tested include subject and object relatives (see 1, 2) and subject and object control in complement clauses (*dizer para* 'tell' vs. *prometer* 'promise' – see 3, 4). All children in the SLI group meet the exclusion criteria for the disorder; children in the ASD group meet the criteria of the DSM-IV for ASD, with diagnoses confirmed by ADI-R or ADOS. Syntactic impairment in both groups was confirmed by a standardized syntactic test (Vieira, 2011).

Results: In each task, we separately considered two groups of results, one including only TD children (TD -3yo; TD - 4yo; TD - 5-7yo; TD - 8-10yo) and the other including the ASD and SLI children compared to the older TD group (age control). For the **act-out task**, in the case of the TD groups, the GLMM model selected the variables structure ($p<0.05$) and the interaction group*structure ($p<0.01$). Difficulties were identified with object relatives in all age groups, with no significant differences between the groups; in contrast, subject control is only problematic for the three younger TD groups (8-11 TD significantly differs from all younger groups, $p<0.001$) – see Graph 1. The GLMM model for SLI, ASD and TD age controls (8-11 years) also selected structure ($p <0.001$) and group*structure ($p<0.001$) – see also Graph 2. As for the **reference judgment task**, the GLMM model for TD groups selected: group, structure and interaction group*structure (all $p<0.01$). Resembling the act-out task, difficulties with object relatives were identified in all age groups (no significant differences between groups); subject control appears to be problematic only for the three younger TD groups (8-11 TD group significantly differs from younger groups, $p<0.01$) – see Graph 3. In the case of SLI, ASD and TD age controls (8-11 years), the GLMM model selects group, structure and group*structure as predictor variables (all $p <0.001$). Only in subject control the three groups are significantly different ($p < 0.05$); other significant differences are found in the subject relative condition (only SLI differs from TD, $p = 0.004$) (Graph 4).

Conclusion: In light of the results obtained we argue that: (i) the syntactic impairment in the (syntactic) SLI and in the linguistically impaired ASD population is not equivalent; (ii) the nature of the problem posed to acquisition by object relatives and subject control (with *promise*-type verbs) is not the same. The different behavior of SLI and ASD groups supports (i). The different developmental patterns in the two different structures support (ii).

(1) Este é o   elefante que mordeu o   urso.   Subject Relative (SR)
      this is the elephant that bit   the bear.
(2) Este é o cavalo que o urso empurrou.   Object Relative (OR)
       this is the horse   that the bear pushed.
(3) O   porco prometeu ao cavalo   saltar.   Subject control (SC)
      the pig   promised the horse   jump.INF
 (4) O   porco disse ao cavalo para saltar.   Object Control (OC)
       the pig   told the horse to   jump.INF
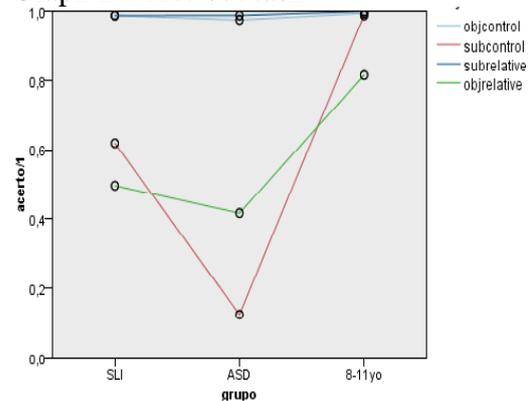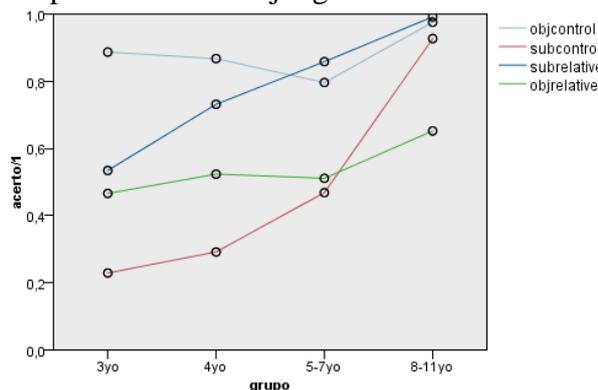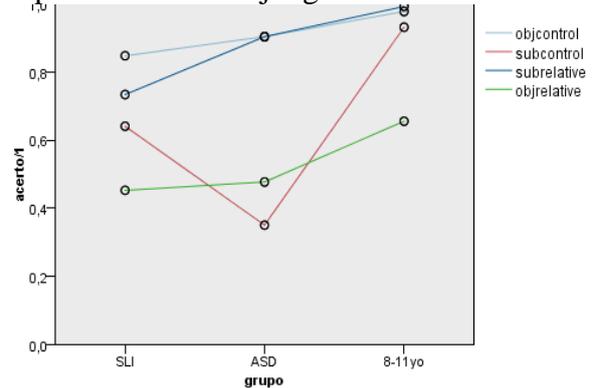
Graph 1 Act-out task
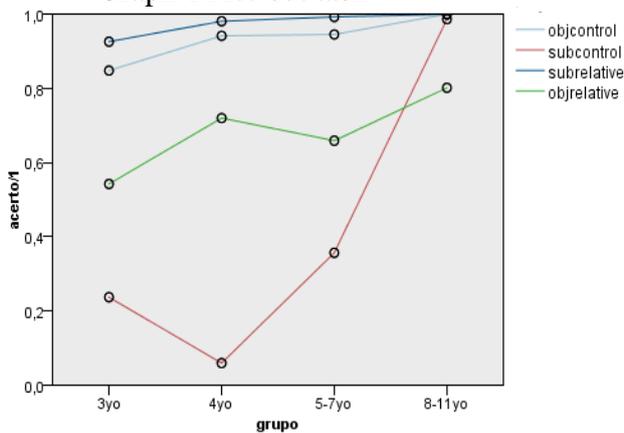
Graph 2 – Act-out task

Graph 3 - Reference judgment task

Graph 4 – Reference judgment task

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