Relative clauses in Down Syndrome: evidence from the Greek language

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Abstract

The aim of the present study is to investigate the comprehension and production of Relative Clauses (RCs) by a group of Greek-speaking individuals with Down Syndrome (DS) and their mentally age-matched peers. The possible asymmetry in performance between Subject-Gap (SG) and Object-Gap (OG) relatives was also examined and an error analysis was conducted. The results indicated that DS individuals encounter difficulties in both comprehending and producing RCs compared to Typically Developing Children (TDC), as well as that both groups performed significantly better in SG than in OG relatives and presented the same pattern of error types. The same pattern of performance observed gives support to the hypothesis that language development in DS could be characterized as more delayed than deviant.

Keywords: Down Syndrome, relative clauses, language development, delay hypothesis

Introduction

Many cross-linguistic studies focus on the language development of individuals with DS and characterize it as either delayed or deviant compared to that of typical population. However, most of them conclude that morphosyntax is severely impaired in this population (Katsarou & Andreou 2022). For the Greek language, very few studies to date have been conducted that have examined morphosyntactic phenomena in this impaired population. The purpose of this study is to investigate both the comprehension and production of RCs by Greek-speaking individuals with DS and to compare their performance to that of mentally age-matched peers. In particular, it was examined whether the individuals with DS comprehend and produce RCs in the same way as the TDC, as well as the asymmetry in their performance between SG and OG relatives, an issue which is studied in typical and atypical populations (McKee & McDaniel 2001; Stavrakaki 2001). Moreover, a detailed error analysis has been conducted.

Methodology

Participants

15 Greek-speaking individuals with DS aged from 9 to 37 with moderate retardation participated in the current study. In addition, a control group of

TDC aged from 6 to 7 years, without any reported learning or neurological disabilities, also participated in the study. The two groups were matched on mental ages through Raven and WAIS-IV tests, as well as on the raw scores of two subtests which assess their expressive language skills, namely the Action Picture Test (T-value=-1,88, p=0,071) and their receptive vocabulary, namely the Peabody Picture Vocabulary Test (T-value=-0,89, p=0,383). Detailed information of the participants and scores on language tests is presented as mean ± standard deviation (SD) in Table 1.

Table 1. Participant information and scores on the language tests for the examined groups

	DS group (N=15)	Cntrl. group (N=15)
Gender (Male-Female)	46,7 %-53,3%	40%-60%
Chronological Age	19,77 ±8,66	6,12 ±0,245
Mental Age	6,37 ±0,48	
Action Picture Test	69 ±4,80	72,40 ± 5,12
PPVT	70,33 ± 7,18	72,67 ±7,24

Materials

Two experiments were conducted. The first experimental task was an elicited production task with twenty trial sentences (10 Subject -10 Object relatives). The second experiment was a picture selection task with twenty trial sentences on five RC types: Subject head-Subject gap (SS), Subject head-Object gap (SO), Object head-Subject gap (OS), Object head-Object gap (OO) and Object head-Object gap with clitics (OOcl).

Results

Descriptive statistics analysis revealed that the mean correctness score of the DS group is statistically significant lower (Production = 2,86, SD 1,46/Comprehension = 8,93 SD 2,22) than that of the TDC for both tasks (Production = 17,67, SD 2,32/ Comprehension = 15,87, SD 1,68). Since the data were not normally distributed non-parametric tests were employed. Mann-Whitney U Test analysis revealed a highly significant difference between the two groups' median scores on production (3,000 ≠19,000, p=0.000) and on comprehension (9,000≠16,000, p=0.000). TDC showed almost equal performance in the median scores of the two tasks (p=0,0310), while the DS participants showed higher performance in the comprehension task than in the production one (p=0.000).

Regarding the production task, both groups showed better performance in subject RCs than in object RCs. However, there was a statistically significant difference between the two types of RCs only in the DS group (p=0,0006),

while TDC did not present a statistically significant difference (p=0,1524). On the other hand, in the comprehension task, examining the SG (SS+OS relatives) and OG (SO+OO relatives) asymmetry, we found that both groups comprehend the SG relatives better than the OG relatives (DS p=0,0001 / TDC p=0,0001). One way ANOVA revealed that the TDC exhibited the highest level of performance in OS (M=0,267 SD=0,458) and SS (M=0,467 SD=0,516) relatives and the lowest level in SO (M=1,800 SD=0,775) and OO (M=0,800 SD=0,561) relatives. The DS group exhibited the highest level of performance in SS (M=1,133 SD=0,743) and OS (M=1,933 SD=0,884), and the lowest level in SO (M=3,067 SD=0,884) and OO (M=2,400 SD=0,632) relatives. Detailed error analysis has been conducted in order to examine the pattern of the responses of the two groups.

In the production task we noticed that both groups presented the same pattern of errors. DS participants preferred to produce main clauses (Subject RCs: M=2,733 SD=0,884 / Object RCs: M=2,667 SD=0,900) or elliptical responses (Subject RCs: M=2,333 SD=0,900 / Object RCs: M=3,000 SD=1,134) instead of the RCs and also made reversal errors (Subject RCs: M=2,333 SD=1,234/ Object RCs: M=2,533 SD=0,743). Respectively, TDC produced main clauses (Subject RCs: M=0,467 SD=0,743/ Object RCs: M=0,800 SD=0,862) and elliptical responses (Subject RCs: M=0,200 SD=0,414/ Object RCs: M=0,467 SD=0,640). Few lexical/semantic errors in the DS's responses were also found (Subject RCs: M=0,333 SD=0,488/ Object RCs: M=0,667 SD=0,617). In the comprehension task we noticed that in SS and OO RCs the most frequent error in the DS group is the reversal error (M=0,600 SD=0,507 / M=1,200 SD=0,676), in SO (M=1,333 SD=0,976) and OS RCs (M=1,000 SD=0,535) is the agent error, while in OOcl the percentage is the same for reversal (M=1,067 SD=0,799) and agent errors (M=1,067 SD=0,704). TDC presented the same pattern of error types in the examined RCs categories.

Discussion

The results indicate that DS individuals encounter difficulties both in comprehending and producing RCs, as they performed at a significant lower level than the TDC. The DS group performed better in the comprehension task than in the production, while TDC performed almost equally well in both tasks. Moreover, both groups performed significantly better in SG relatives than in OG relatives, with the overall performance of the DS group being at a lower level in both tasks. The same pattern of performance observed in both groups, as well as the same pattern of errors produced gives support to the hypothesis that language development in DS could be characterized as more delayed than deviant. Our findings are in line with previous cross-linguistic studies the results of which revealed difficulties with RCs on the part of individuals with DS (Stathopoulou 2007, Witecy & Penke 2017). As the RC construction has not

been extensively studied yet, especially in the Greek language, our findings help to fill in this research gap. However, more research is needed in this field in order to elucidate further the delay hypothesis especially in the morphosyntactic domain and understand the kind of difficulties Greek speaking individuals with DS present so as to help them improve their morphosyntactic abilities.

Acknowledgements

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