Receptive vocabulary of children with Down syndrome: an eye-tracking task

INTRODUCTION

How do children with Down syndrome (DS) develop their receptive vocabulary? In order to answer this question, researchers have developed parental reports to evaluate the growth of their vocabulary size (Berglund & Eriksoon, 2001; Caselli et al., 1998; Galeote et al., 2006) and have also measured it by means of several standardized tests (Bello, Omófrico, & Caselli, 2014). Nonetheless, it has been difficult to come up with a measure to evaluate directly the receptive vocabulary of infants with DS or children who cooperate very little in tasks in which pointing or touching is involved. These difficulties might be tackled by using methods in which demands are low, such as eye-tracking tasks. Furthermore, visual attention measures have been reported to have a high predictive value for later linguistic abilities (Marchman & Fernald, 2008).

METHOD

Participants: Fourteen children with DS (regular trisomy), mean chronological age = 6.2 years (SD = 3.38) and mean mental age = 3.56 years (SD= 1.43), without visual and hearing problems.

Instrument: Mexican adapted version of the Inventario de Desarrollo Comunicativo MacArthur-Bates para niños con síndrome de Down (CDI-DOWN Galeote et al., 2006)

Design: eight trials in which two familiar images (target-distractor) depicting familiar objects were presented while hearing a carrier phrase in which a target was embedded “Look [common noun]”.

RESULTS

Coding: Eye-gaze data was collected by means of an eye-tracker (TOBII TX 300).

Measure: Longest Look (LLK).

First Analysis: Paired sample t-tests revealed a significant increment (t13) = 2.33, p < .05) in the longest look to the target relative to the distractor from the pre- (LLK = -101.36; SD = 200.64) to the post-naming phase (LLK = 167.16, SD = 475.95).

Second Analysis: explore the relationship between children’s scores in the eye-tracking task and the size of their vocabularies according to the parental report. A partial correlation analysis of the total CDI scores (comprehension, production and gestures) yielded a significant result (r(7)= .75, p = .018).

DISCUSSION

The current outcome shows that children with DS understood the words presented in the eye-tracking task. This comprehension was also validated by parental reports: children who showed more comprehension in the eye-tracking task were children whose parents reported a larger vocabulary. The relationship between participants’ performance in the eye-tracking task and their vocabulary scores is independent of their mental age.

Eye-tracking measures could bring us the opportunity to evaluate “the precocious discovery of word meanings” (Bergelson & Swingley, 2012) of children with mental disability and the possibility of having more predictive measures for later linguistic abilities.

References


ACKNOWLEDGMENTS

- Grant PAPIIT IN309214 “Desarrollo de lenguaje en niños con síndrome de Down: la comprensión temprana”
- Grant CONACYT-167900 “Mecanismos en la formación y modulación de redes semánticas durante la infancia y la etapa adulta”
- Foundation Jeróme Lejeune “Language comprehension in Down syndrome”
- Participant Schools: Integración, Down I. A. P., Colegio Pimpinelo, Jerusalen, Fundación Arte Down México A.C., Fundación CTSU-CA I.P.

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