



Syntactic bootstrapping in children with Down syndrome: The impact of bilingualism



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ABSTRACT

Purpose: The purpose of the study was to add to our knowledge of bilingual learning in children with Down syndrome (DS) using a syntactic bootstrapping task.

Method: Four groups of children and youth matched on non-verbal mental age participated. There were 14 bilingual participants with DS (DS-B, mean age 12;5), 12 monolingual participants with DS (DS-M, mean age 10;10), 9 bilingual typically developing children (TD-B; mean age 4;1) and 11 monolingual typically developing children (TD-M; mean age 4;1). The participants completed a computerized syntactic bootstrapping task involving unfamiliar nouns and verbs. The syntactic cues employed were *a* for the nouns and *ing* for the verbs.

Results: Performance was better on nouns than verbs. There was also a main effect for group. Follow-up *t*-tests revealed that there were no significant differences between the TD-M and TD-B or between the DS-M and DS-B groups. However, the DS-M group performed more poorly than the TD-M group with a large effect size. Analyses at the individual level revealed a similar pattern of results.

Conclusion: There was evidence that Down syndrome impacted performance; there was no evidence that bilingualism negatively affected the syntactic bootstrapping skills of individuals with DS. These results from a dynamic language task are consistent with those of previous studies that used static or product measures. Thus, the results are consistent with the position that parents should be supported in their decision to provide bilingual input to their children with DS.

Learning outcomes: Readers of this article will identify (1) research evidence regarding bilingual development in children with Down syndrome and (2) syntactic bootstrapping skills in monolingual and bilingual children who are typically developing or who have Down syndrome.

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1. Introduction

1.1. Purpose

Down syndrome (DS) is a disorder resulting from trisomy of the 21st chromosome which results in cognitive and language delays. In fact, language acquisition is one area of development that is particularly problematic for children with DS (Chapman & Kay-Raining Bird, 2011). Interventionists have often recommended that language input be restricted to one language for children with intellectual challenges, such as DS, even when they are being raised in a bilingual environment as reported by Thordardottir (2002) and Paradis, Genesse, and Crago (2011). A potential factor in this recommendation is the view that bilingualism may negatively impact linguistic development, particularly for children with cognitive and/or linguistic challenges. If this were true, restricting the input to a single language would be a reasonable recommendation as the best way to support language learning. However, the research does not support this position (Paradis et al., 2011). Furthermore, limiting the language learning opportunities to a single language can have significant negative consequences for any child and their family such as a reduced ability to communicate with all family members and interact in their ethnic community (Paradis et al., 2011). Although limited, there is evidence that children with DS can become functionally bilingual (e.g., Edgin, Kumar, Spanò, & Nadel, 2011; Kay-Raining Bird et al., 2005b).

Little is known about the nature of bilingual learning in children with DS because studies have included only product measures, that is, measures of language skills at one point in time (Kohnert, 2008). Testing bilingual speakers is challenging as testing procedures developed for monolingual speakers are not appropriate and can lead to biased assessments (Kohnert, 2008; Paradis et al., 2011). The use of dynamic language tasks, or process tasks, in which the individual's ability to learn is assessed may be particularly important in understanding language skills in bilingual contexts (Kohnert, 2008). Given the increasingly diverse nature of society, it is important that we better understand bilingual development in children with DS. The current study sought to add to our knowledge of language learning in bilingual children with DS using a syntactic bootstrapping task, a dynamic language task.

1.2. Impact of bilingualism

The impact of bilingualism on development has been an area of research for many years. Some early studies did report disadvantages for cognitive and linguistic development but more recent studies have refuted this contention. In fact, research has now provided evidence for a variety of cognitive and linguistic advantages that result from bilingualism in typically developing children (see Adesope, Lavin, Thompson, & Ungerleider, 2010; Bialystok, 2001; Barac & Bialystok, 2011 for reviews). Metalinguistic ability is one area in which advantages have been seen; however, this is not true in all studies. Bilingual advantages are more likely to be reported in studies involving individuals exposed to both languages from early in life (Adesope et al., 2010) and those who display relatively balanced abilities in their languages (Bialystok, 2001). The task used to assess metalinguistic skills is also a factor, with tasks that involve a high level of control such as those requiring selective attention in the presence of competing or misleading information, more often revealing an advantage (Bialystok, 2001). In addition, metalinguistic advantages seem to be related to the degree of bilinguality achieved (Cromdal, 1999; Cummins, 1979, 2000). Cummins has hypothesized that a threshold level of bilingualism is necessary before the beneficial effects of bilingualism can be realized.

Although less extensive, there is a body of literature examining bilingual development in children with language impairments (LI). This research suggests that bilingual children with LI demonstrate difficulties learning both languages and the difficulties seen in bilingual children with LI are similar to those seen in monolingual children with LI learning the same language (e.g., Kohnert, 2008; Paradis, 2007; Paradis et al., 2011) and thus does not support the notion that bilingualism has a negative impact on language development in children with impairment.

1.3. Monolingual development in DS

The research cited above involved children with language impairments but normal cognitive development. Children with DS display a broader range of deficits including both cognitive and language impairments. Studies of oral language development in monolingual children with DS have revealed a typical pattern, although there is individual variability. Children with DS show a relative strength in receptive language skills, particularly vocabulary skills which are often equivalent to non-verbal cognitive development. Expressive language skills lag behind receptive skills and the gap between the two widens with age. Their production of first words and early word combinations is delayed although the functions expressed are similar (see Chapman & Kay-Raining Bird, 2011 for review).

Children with DS display a particular deficit in expressive morphosyntactic skills. This is seen in both a smaller mean length of utterance (MLU) in comparison to mental age matches (Chapman, Seung, Schwartz, & Kay-Raining Bird, 1998) and poorer grammatical morpheme use compared to typically developing children matched for MLU (Chapman et al., 1998; Eadie, Fey, Douglas, & Parsons, 2002). However, these skills continue to develop into adolescence.

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