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Do children with Williams syndrome have unusual vocabularies?

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Abstract

Aims: The present study investigated whether children with Williams syndrome (WS) produced a higher number of different word roots and low-frequency words in spontaneous speech in a topic controlled setting.

Method: A group of children with WS was compared to a group of typically developing children matched for chronological age (CA), and a group of typically developing children matched for receptive language abilities (LA). A further comparison was made between the WS group and a group of children matched for non-verbal abilities (NA). Spontaneous speech was elicited using a narrative task. The data were analysed using three different measures of lexical diversity. The results revealed that the children with WS neither produce a higher number of different word roots nor significantly more low-frequency items in comparison to the CA, LA and NA matched participants. Furthermore, language and non-verbal abilities did not predict the number of different and low frequency words used by the typically developing children, however in the WS group non-verbal abilities predicted the number of low-frequency words and receptive language skills predicted the number of different words produced. It is concluded that individuals with WS do not have unusual vocabularies and that the subdomain of language, lexical semantics, does not seem to be an independent cognitive skill.

Keywords: Williams syndrome; Low-frequency words; Different word roots; Unusual vocabulary

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1. Introduction

Williams syndrome (WS) is a rare genetic disorder which results from a micro-deletion on chromosome 7. It is characterised by a specific face appearance known as 'elfin face', cardiovascular and renal problems, failure to thrive in infancy and moderate to severe learning difficulties. The WS neuro-cognitive profile presents with relative cognitive strengths and weaknesses, which has provoked wide interest amongst those involved in the study of human cognitive organisation. Language abilities in individuals with WS have been reported to be relatively unimpaired in comparison to their general cognitive abilities, which have been reported to be impaired (Arnold, Yule, & Martin, 1985; Bellugi, Marks, Bihrle, & Sabo, 1988; Bellugi, Wang, & Jernigan, 1994; Crisco, Dobbs, & Mulhern, 1988; Karmiloff-Smith, Klima, Bellugi, Grant, & Baron-Cohen, 1995; Kataria, Goldstein, & Kushnik, 1984; Udwin, Yule, & Martin, 1987). The WS profile has, therefore, often been referred to in the literature as showing evidence for clear dissociations between language and non-verbal abilities, thus supporting theories which view language as a skill which develops independently of other cognitive abilities from birth (Pinker, 1999; Smith & Tsimpli, 1995).

Unlike early descriptions of expressive language abilities in WS as 'spared' 'intact' or 'at normal levels', it is becoming apparent from recent research that individuals with WS show delays, and sometimes deviance with regard to their grammatical development (Grant, Valian, & Karmiloff-Smith, 2002; Karmiloff-Smith et al., 1997; Stojanovik, Perkins, & Howard, 2004; Volterra, Capirci, Pezzini, Sabbadini, & Vicari, 1996; Volterra, Caselli, Capirci, Tonucci, & Vicari, 2003). This stream of research has challenged the claims that the WS profile provides evidence that the typical cognitive system is fractioned into independent, domain specific and informationally encapsulated modules from birth, and it has been suggested that WS reveals an atypical trajectory of development in which the chromosomal deletion subtly changes the developmental pathway, which may have stronger effects on some outcomes and weaker on others (Karmiloff-Smith, 1998).

It has been widely acknowledged that, compared to other populations with cognitive deficits, teenagers and young adults with WS have rather impressive vocabularies, with vocabulary scores on standardised receptive measures being in advance of their mental age (Bellugi et al., 1988; Rossen, Bihrle, Klima, Bellugi, & Jones, 1996). However, younger children with WS have been reported to perform much lower than expected for their chronological age on tests of vocabulary albeit in line with their mental age (Thal, Bates, & Bellugi, 1989; Volterra et al., 2003). Furthermore, research has also shown that children with WS are delayed with the acquisition of their first words (Mervis, Robinson, Rowe, Becerra, & Klein-Tasman, 2003).

Atypical vocabulary has been reported to be one of the most notable features of the language of adolescents and adults with WS, including use of unusual or low-frequency words (Thomas et al., 2006). Anecdotal reports have stated that the language of individuals with WS is fluent but containing "florid and erudite-sounding vocabulary items", which is not the case with other atypical populations with learning difficulties, such as Down's syndrome (DS) (Reilly, Klima, & Bellugi, 1990; Volterra et al., 1996). Bellugi, Bihrle, Neville, Jernigan, and Doherty (1992) reported that individuals with WS sometimes made very unusual, low frequency and idiosyncratic lexical choices, such as: 'evacuate the glass' meaning 'empty'. Rossen et al. (1996) also reported that individuals with WS produced semantic alternatives, which were not appropriate for the context. Some of the