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The development of metaphorical language comprehension in typical development and in Williams syndrome

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ABSTRACT

The domain of figurative language comprehension was used to probe the developmental relation between language and cognition in typically developing individuals and individuals with Williams syndrome. Extending the work of Vosniadou and Ortony, the emergence of nonliteral similarity and category knowledge was investigated in 117 typically developing children between 4 and 12 years of age, 19 typically developing adults, 15 children with Williams syndrome between 5 and 12 years of age, and 8 adults with Williams syndrome. Participants were required to complete similarity and categorization statements by selecting one of two words (e.g., either “The sun is like ___” or “The sun is the same kind of thing as ___”) with word pairs formed from items that were literally, perceptually, or functionally similar to the target word or else anomalous (e.g., *moon*, *orange*, *oven*, or *chair*, respectively). Results indicated that individuals with Williams syndrome may access different, less abstract knowledge in figurative language comparisons despite the relatively strong verbal abilities found in this disorder.

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Introduction

Although metaphor and analogy have traditionally been viewed as a relatively rare linguistic ornament that complements literal language, recent research suggests that metaphorical language is, in

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fact, commonplace in everyday communication (e.g., Graesser, Long, & Mio, 1989; Pollio, Barlow, Fine, & Pollio, 1977). For example, various strands of linguistic evidence suggest that metaphor is important for communicating, and perhaps reasoning, about abstract concepts (e.g., Gibbs, 1994; Lakoff & Johnson, 1980). Understanding metaphorical language necessitates certain degrees of proficiency in both cognition and language, and it relies on several component abilities such as processing capacity, metalinguistic skill, an understanding of communicative pragmatics, and semantic knowledge (see Vosniadou, 1987a, 1987b). In this article, the domain of figurative language comprehension is used to probe the developmental relation between language and cognition in typically developing (TD) individuals and individuals with Williams syndrome (WS).

Although definitions of what constitutes a metaphorical comparison vary considerably (e.g., Bowdle & Gentner, 2005), it seems uncontroversial that understanding verbal metaphor involves accessing some alignment between two terms while recognizing that two terms belong to different conventional categories. This, of course, necessitates knowledge of such categories. Therefore, one can take an initial step in ascertaining whether children are capable of understanding metaphor at a given stage in development by investigating their ability to understand nonliteral similarity statements. This ability to understand nonliteral similarity statements entails understanding that belonging to different semantic or conceptual categories can nevertheless be similar in certain ways. Vosniadou and Ortony (1983) required children between 3 and 6 years of age, and also adults, to complete similarity statements by selecting one of two words from either (a) a metaphorical/literal pair of alternatives, (b) a literal/anomalous pair, or (c) a metaphorical/anomalous pair. For example, the experimenter would say “A river is like a ___,” and the participant was required to respond with either *snake* or *lake* in pair (a), *lake* or *cat* in pair (b), and *snake* or *cat* in pair (c). The authors assumed that selecting metaphorical or literal responses over anomalous ones justified attributing the ability to distinguish meaningful similarity statements from anomalous ones and that selecting a literal response over a metaphorical one indicated that the terms of the literal comparison were understood as more similar than the terms in the metaphorical comparison. The results of the comparison task indicated that even the youngest children were able to distinguish meaningful similarity statements from anomalous ones.

In addition to this comparison task, which involved perceiving some similarity between two terms, a further group of participants undertook a categorization task that tested for knowledge of conventional categories. This was identical in format to the comparison task except that the experimenter would say, for example, “A river is the same kind of thing as ___” and there was no metaphorical/anomalous condition. In the categorization task, literal responses were clearly correct responses and metaphorical responses were incorrect ones (a river is the same kind of thing as a lake but not of a snake). Children age 4 years or above showed that they possessed the conventional categories that were assumed to be transgressed in the metaphorical juxtapositions of the comparison task, thereby demonstrating understanding of nonliteral similarity.

The current study adapted and extended the above paradigm with two main aims. The first aim was to investigate the relative development of perceptual and functional nonliteral similarity in TD children. The second was to explore the development of requisites for metaphor comprehension in WS. Functional similarity can be defined as a correspondence based on what things do (e.g., the sun is like an oven because they both produce heat). Functional similarity, then, is a type of relational similarity (based on causal relations). There is robust evidence that young children find metaphorical comparisons based on physical or perceptual similarity easier to understand than those based on abstract and complex relations (e.g., Billow, 1981; Gentner & Stuart, 1983), but it is not yet clear when this difference emerges, whether this is the case for individuals with WS, or whether the difference is simply due to the fact that children lack the requisite relational *knowledge*.

Gentner (1988) proposed that a “relational shift” occurs during typical development (at around 6 or 7 years of age) whereby children interpret metaphorical comparisons first in terms of object similarity (i.e., attributional/perceptual similarity) and then in terms of relational similarity. However, Goswami (1996) argued against the relational shift hypothesis, citing a study by Goswami and Brown (1989) in which children as young as 3 years of age were able to correctly complete pictorial analogies based on familiar causal relations (but see Ratterman & Gentner, 1998). Goswami (1996) argued that as soon as relational knowledge is acquired, it can be used by children in comprehending relational comparisons.

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