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# Research in Autism Spectrum Disorders

Journal homepage: <http://ees.elsevier.com/RASD/default.asp>

## Metaphor and metonymy comprehension in Chinese-speaking children with high-functioning autism

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### ARTICLE INFO

#### Article history:

Received 21 September 2014

Accepted 3 November 2014

Available online 25 November 2014

#### Keywords:

Chinese children with high-functioning autism

Metaphor comprehension

Metonymy comprehension

Semantic knowledge

### ABSTRACT

This study investigated the role of semantic knowledge in metaphor and metonymy comprehension in Chinese-speaking children with high-functioning autism (HFA). In the contexts of simple short stories, the authors studied autistic children's comprehension of metaphors in the fashion of "X is Y" and metonyms in the fashion of "X metonymically refers to Y". Furthermore, the authors examined the semantic role of receptive vocabulary in metaphor and metonymy comprehension in autistic children, and compared it to that in typically developing (TD) children matched to chronological age, verbal IQ, performance IQ and total IQ. It was found that Chinese children with HFA exhibited lower competence in metonymy comprehension than in metaphor comprehension; semantic knowledge was correlated with the comprehension of metaphor rather than that of metonymy; Chinese children with HFA were capable to retrieve similarities between the two terms of the metaphor and construct conventional match relations, but not so capable as the TD peers; the static knowledge of the receptive vocabulary of autistic children cannot fully and effectively predict their performance on metaphor tasks, presumably because they represent semantic knowledge and process information in a manner distinct from TD children.

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## 1. Introduction

Due to pragmatic impairments, autistic populations, autistic children in particular, are restricted to the literal meaning in comprehension of figurative language. Metaphors and metonyms, as two closely related types of figure of speech are very common in daily language use. Is it the case that autistic children can only interpret figurative language literally? Is there a peculiar comprehension pattern and thus a peculiar mechanism in autistic children as compared to their TD peers? To the best of our knowledge, there have been few studies conducted on these issues, and even fewer or no studies at all based on the data from native Chinese children with HFA.

### 1.1. Role of semantic knowledge in metaphor and metonymy comprehension in autistic children

Previous studies have confirmed the deficits of autistic children in metaphor and metonymy comprehension. However, the majority of early studies addressed the issue in the frame of the theory of mind (ToM), regarding the deficits result from

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the difficulty in inferring the communicative intentions of the speaker, and thus attributed the pragmatic impairments to the deficits in ToM and first-order ToM in particular (e.g. Dennis, Lazenby, & Lockyer, 2001; Happé, 1993; MacKay & Shaw, 2004; Minshew, Goldstein, & Siegel, 1995). But later studies did not find a direct link between ToM understanding and impairment in metaphor and metonymy comprehension (e.g., Adachi et al., 2004). Some researchers proposed from a new perspective that metaphor comprehension requires individuals to be equipped with broad enough semantic representations to identify the similarities between the two terms involved. Norbury (2005) believed that autistic children have poorer vocabularies and impoverished semantic representation for the words they do have than TD peers, which results in deficits in metaphor comprehension.

Norbury (2005) indicated that semantic knowledge is a strong predictor on metaphor comprehension in children with communication impairments including children with autism. He used the Test of Word Knowledge, which involved two subtests: a test of figurative expressions and a test of multiple contexts. But the two subtests contained too many metaphors and other figures of speech, and the individual children with communication impairments in the test were not homogeneous at all, and thus no conclusion exclusively valid to autistic children was reached. Melogno, D'Ardua, Pinto, and Levi (2012) and Melogno, D'Ardua, Pinto, and Levi (2012) found that children with HFA were capable to process metaphors in a peculiar way, and there was a link between deficit in semantic skills and metaphor comprehension impairment. Regretfully, the research did not measure matched semantic knowledge of the children with HFA, and the metaphors examined were limited to sensorial ones, and the method used to verbally interpret the figurative language was too heavy a metalinguistic burden for the autistic children with expressive difficulties, and thus it could not conclude that semantic knowledge is the determining factor in metaphor comprehension. Rundblad and Annaz (2010) examined metaphor and metonymy comprehension in autistic children. They proposed a special category involving two rather than one single domain be constructed, and further pointed out that the similarities between the two concepts involved is hard to define, and thus metaphor is more complex than metonymy for the former involves two domains whereas the latter only one. Compared to metonymy, metaphor is more difficult for autistic children to understand. Results from experiments have confirmed that autistic children are merely delayed in metonymy comprehension, but severely impaired in metaphor comprehension. Contrary to Norbury who believes that receptive vocabulary knowledge can predict to certain extent metaphor comprehension in autistic children, Rundblad and Annaz hold that receptive vocabulary knowledge cannot predict metaphor comprehension, but can predict metonymy comprehension effectively.

### 1.2. Relationship between semantic knowledge in metaphor and metonymy comprehension and conventionality

In terms of conventionality, either metaphors or metonyms can be regrouped into novel and conventional types. Mashal and Kasirer (2011) found that autistic children have difficulty only in understanding conventional metaphors, and they display no salient difference from TD children in understanding novel metaphors. They think that this may be due to the fact that children's comprehension of novel metaphors builds on spontaneous construct, they do not encode it in their mental lexicon and acquired semantic knowledge is less likely to function properly, and thus TD children do not display their strengths in semantic knowledge in comprehension of novel metaphors. The research indicated that metaphor comprehension differs in its reliance on semantic knowledge level according to their degree of conventionality. This interpretation has its theoretical basis in linguistics. Usually, the comprehension of conventional metaphors draws only on the conventionalized match relation between the source and target domains stored in long-term memory, inferencing can be made simply by mapping the concept in the source domain onto the concept in the target domain in a direct way (Zhu & Jiang, 2003). But the comprehension of novel metaphors is more complex. The theory of conceptual integration believes novel metaphors are not simply a mapping from the source to target domains, rather a complex multi-space mapping of conceptual integration networks, a real-time, dynamic semantic construction (Coulson, 2001). Therefore, conventional metaphors rely more on semantic knowledge level than novel metaphors. So far there have been far few studies on the issue of "the influence of conventionality on metaphor comprehension" and no investigation has ever been made into the issue whether conventionality influences metonymy comprehension.

### 1.3. Current study

The current study took native Chinese children with HFA as subjects, aiming to explore: (1) whether populations with HFA have difficulties in comprehension of metaphor and/or metonymy, (2) whether conventionality affects comprehension of metaphor and/or metonymy, and (3) whether lexical semantic knowledge correlates to comprehension of metaphor and/or metonymy.

## 2. Methods

### 2.1. Participants

The participants included 15 native Chinese children with HFA (all males) and 15 TD children (7 males, 8 females). Fourteen of the 15 participants with HFA came from Qingdao Yilin Autism School, 1 from Changzhou Tian'ai Recovery Center. All the children in the experimental group were diagnosed as the HFA group. The TD group were senior kindergarteners or

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