



# Language comprehension of children with Asperger's disorder and children with autistic disorder



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## ABSTRACT

This study investigated language comprehension of Mandarin-speaking children with Asperger's disorder (AspD) ( $n = 88$ ) and children with autistic disorder (AD) ( $n = 136$ ) and compared their language comprehension to that of children with typical development (TD) ( $n = 832$ ). The Mandarin Token Test was used in this study. This study found that (a) when IQ was not controlled, children with AspD showed higher language comprehension than did children with AD. But, when IQ was controlled, there was no significant difference between the two groups; (b) children with AspD did not differ from children with TD in language comprehension; (c) gender difference was found in the AspD group at the middle childhood age level (10–12 years).

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## 1. Introduction

Autism spectrum disorders (ASDs) refer to a group of conditions involving communication deficits, social interaction deficits, and behavior challenges [Centers for Disease Control and Prevention (CDC), 2013]. There are three different types of ASDs including autistic disorder, Asperger's disorder, and pervasive developmental disorder-not otherwise specified (PDD-NOS) (CDC, 2013). Individuals with different autism diagnoses demonstrate different language abilities and a wide range of language abilities can be found in these individuals (Kjelgaard & Tager-Flusberg, 2001; Lindgren, Folstein, Tomblin, & Tager-Flusberg, 2009; Maljaars, Noens, Scholte, & van Berckelaer-Onnes, 2012). Many children with ASDs have greater impairment in language comprehension than language expression (Lloyd, Paintin, & Botting, 2006; Luyster, Kadlec, Carter, & Tager-Flusberg, 2008; Weismer, Lord, & Esler, 2010). Language comprehension seems to be delayed in most individuals with ASDs (Kjellmer et al., 2012; Manolitsi & Botting, 2011; Thurm, Lord, Lee, & Newschaffer, 2007). Language comprehension is the ability to understand spoken or written language (Miller & Rhea, 1995). The language comprehension in this study refers to listening comprehension skills.

Individuals with autistic disorder (AD) are characterized by qualitative impairment in social interaction and communication as well as displaying repetitive and stereotyped patterns of behavior and interests (DSM-IV-TR; American Psychiatric Association, 2000). Individuals with Asperger's disorder (AspD) are characterized by qualitative impairment in social interaction and displaying repetitive and stereotyped patterns of behaviors and interests (DSM-IV-TR; American Psychiatric Association, 2000). Based on the DSM-IV-TR diagnostic criteria, individuals with AspD differ from individuals with AD in language and cognitive development; there is no clinically significant delay in cognitive development and no language delay in individuals with AspD.

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Limited studies have investigated the difference in language comprehension between children with AspD and children with typical development (TD) and the difference in language comprehension between children with AspD and children with AD. Saalasti et al. (2008) found that children with AspD did not differ from children with TD in language comprehension. Kjellmer et al. (2012), Noterdaeme, Wriedt, and Hohne (2010), and Szatmari, Archer, Fisman, Streiner, and Wilson (1995) found that children with AspD had better language comprehension than did children with AD. But, Ramberg, Ehlers, Nyden, Johansson, and Gillberg (1996) found that children with AspD did not differ from children with AD in language comprehension. The inconsistency in the findings about the difference in language comprehension between children with AspD and children with AD may be explained by IQ since language comprehension is generally influenced by cognitive ability (Kjellmer et al., 2012; Luyster et al., 2008; Weismer et al., 2010).

A wide range of language assessment tools have been used in the studies examining language comprehension abilities of individuals with ASDs. For example, Kjellmer et al. (2012), Ramberg et al. (1996), and Szatmari et al. (1995), used the Reynell Developmental Language Scale (RDLS) to examine language comprehension of children with ASDs without ID. The RDLS assesses sentence comprehension with increasing length and grammatical complexity using concrete objects and pictures (Kjellmer et al., 2012). Lloyd et al. (2006) used the Clinical Evaluation of Language Fundamentals which included word and sentence comprehension tests to examine language comprehension of children with ASDs. Ramberg et al. (1996) and Chan, Cheung, Leung, Cheung, and Cheung (2005) used the Token Test to understand language comprehension of children with ASDs with and without ID. The Token Test uses concrete objects and oral instructions to test language comprehension. Different assessment tools may reveal different patterns of strengths and weaknesses in language comprehension of children with ASDs (Luyster et al., 2008). Many of the language tests rely on pictures and vocabulary to test language comprehension. However, children with AD with intellectual disability (ID) have difficulties in understanding the symbolic nature of pictures (Maljaars et al., 2012).

The Token Test was developed to limit the intellectual functions on testing language comprehension (De Renzi & Vignolo, 1962). The test consists of 20 circle and rectangle tokens with five colors (e.g., red, blue, green, yellow, white) and two sizes (e.g., large, small). The test administrator gives a verbal instruction (e.g., "Pick up the yellow rectangle") and the participant is required to comply with the verbal instruction. Although the test was originally developed for individuals with aphasia, the test has been used to understand language comprehension in individuals with brain injuries (Aram & Ekelman, 1987; Brookshire, 1978; Poeck & Pietron, 1981; Poeck, Orgass, Kerschen, & Hartje, 1974; Zaidel, 1977), children with hearing impairment (DiSimoni & Borino, 1982), children with special needs (di Simoni & Mucha, 1982), children with articulation disorders (Shelton, Arndt, & Johnson, 1977), individuals with TD (Remschmidt, Niebergall, Geyer, & Merschmann, 1977; Smith, Mann, & Shankweiler, 1986; Turkiymaz & Belgin, 2012), individuals with Alzheimer's disease (Andrikopoulos & Beuter, 2001; de Paula, Bertola, Nicolato, de Moraes, & Malloy-Diniz, 2012; Swihart, Becker, & Boller, 1987; Swihart, Panisset, Becker, Beyer, & Boller, 1989), children with learning problems (Amorosa, Kleinhanslntner, & Vonbenderfisser, 1980; Lapointe, 1976), and individuals with multiple sclerosis (Stenager, Knudsen, & Jensen, 1992). The Token Test has been used in people across different countries with different languages, including Japanese speaking individuals (Yamada, 1992), Dutch-speaking children (Paquier et al., 2009), Brazilian seniors (Moreira et al., 2011), Mexican children (Gallardo, Guardia, Villasenor, & McNeil, 2011), Spanish speaking adults (Aranciva et al., 2012), and Cantonese-speaking individuals (Kay Chen, McNeil, Hill, & Pratt, 2013).

To the best knowledge of the researchers of this study, only one study has used the Token Test in Chinese children with ASDs (Chan, Cheung, Leung, Cheung, & Cheung, 2005). Chan et al. (2005) used the Token Test to examine language comprehension of children with TD ( $N = 27$ ) and children with ASDs ( $N = 19$ ). The findings from this study suggested that children with TD differed from children with ASDs in language comprehension. However, given that this study had small number of participants and no individuals with AspD, and Cantonese was the first language of the participants, there is a need of a study including more participants to confirm their findings and including participants with AspD to understand the difference between individuals with AspD and individuals with AD in language comprehension. Further, to include Mandarin speaking children can understand the nature of language comprehension in these children.

Understanding the true nature of language comprehension of children with ASDs is necessary for developing treatments to meet these children's needs. Using a language assessment tool which involves limited intellectual functions can help in understanding the true nature of language abilities of children with ASDs, especially those who have ID. Many studies have been conducted to examine language abilities of English-speaking children with ASDs. But, there is a limited number of studies focusing on non-English-speaking children with ASDs. There are gender differences in language comprehension in children with TD (Glenberg, Webster, Mouilso, Havas, & Lindeman, 2009). Typically developing girls are more advanced in early language development (Fenson et al., 1994) and tend to have better language skills (Bouchard, Trudeau, Sutton, Boudreault, & Deneault, 2009) than typically developing boys. A meta-analysis study conducted by Wijngaarden-Cremers et al. (2013) suggested that there was no gender difference in communication in children with ASDs. However, little is known about gender differences in language comprehension of children with AspD and children with AD.

This study aims to examine language comprehension of school-aged children with AD, children with AspD, and children with TD using the Mandarin Token Test (MTT). Specific research questions that were addressed in this study included: (a) Do children with AspD differ from children with TD in language comprehension as measured by the MTT? (b) Do children with AspD differ from children with AD in language comprehension as measured by the MTT? (c) Is there a gender difference in children with AspD and children with AD in language comprehension as measured by the MTT?

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