Psychometric properties of the Chinese version of the Social Responsiveness Scale

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ABSTRACT

This study evaluated the psychometric properties of the Chinese version of the Social Responsiveness Scale (Chinese SRS). We assessed 1419 grade 1 to grade 8 students from northern Taiwan and 401 clinic-based participants (aged 3–20, male 90.3%). All clinic-based participants were clinically diagnosed with autism spectrum disorders (ASDs), including autistic disorder and Asperger's disorder, according to the DSM-IV diagnostic criteria and confirmed by a parental interview using the Chinese version of the Autism Diagnostic Interview-Revised (ADI-R). All the parents completed the Chinese SRS. Parents of participants with ASD also completed the Chinese version of the Social Communication Questionnaire (Chinese SCQ). Exploratory factor analysis revealed a 4-factor structure which was validated by confirmatory factor analysis with an adequate fit (root mean square error of approximation 0.031, comparative fit index 0.983, adjusted goodness of fit index 0.910, standardized root mean square residual 0.050) after excluding five items with low correlation coefficients. The 4-week test–retest reliability (intraclass correlations 0.751–0.852), internal consistency (Cronbach's alpha 0.944–0.947), and convergent validity with the Chinese SCQ (Pearson correlations 0.609–0.865) demonstrated well-accepted psychometric performance. Participants with ASD reported significantly higher total scores and subscale scores for the four factors (i.e. socio-communication, autism mannerisms, social awareness, and social emotion) compared to those without ASD. Our findings indicate that the Chinese SRS is a reliable and valid instrument for measuring autistic traits in the ethnic Chinese population in Taiwan.

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1. Introduction

Autism spectrum disorders (ASDs) are a group of pervasive neurodevelopmental disorders characterized by abnormal socio-communication deficits and restricted/stereotyped behaviors and interest (American Psychiatric Association, 2000; Levy, Mandell, & Schultz, 2009), which can cause crucial impairments to daily life (Bertoglio & Hendren, 2009; Hilton, Graver,

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& LaVesser, 2007; Scott, Baron-Cohen, Bolton, & Brayne, 2002). The prevalence of ASD has dramatically increased to as high as 0.9% in the past decade (Brugha et al., 2011; Kadesjo, Gillberg, & Hagberg, 1999; Mulvihill et al., 2009) with a four times higher risk in males compared to females (Levy et al., 2009; Mulvihill et al., 2009). There is a large variation in the prevalence rates between studies (Brugha et al., 2011; Kim et al., 2011; Lazoff, Zhong, Piperni, & Fombonne, 2010; Mulvihill et al., 2009; Samadi, Mahmoodizadeh, & McConkey, 2012; Wong & Hui, 2008) explainable by varied diagnostic and methodological approach employed as well as different levels of awareness about ASD (Levy et al., 2009; Posserud, Lundervold, Lie, & Gillberg, 2010; Wong & Hui, 2008). The clinical and genetic heterogeneity of ASD (Levy et al., 2009; Yirmiya & Charman, 2010) make it difficult to identify its underlying pathogenesis and to differentiate ASD from other developmental disorders (Constantino, 2005; Gotham, Risi, Pickles, & Lord, 2007; Wisdom, Dyck, Piek, Hay, & Hallmayer, 2007).

Taiwanese official statistics reveal that only 0.05% of individuals who were clinically diagnosed with ASD and received medical services or special education (Ministry of the Interior, 2011); a figure that is much lower than that reported in previous Western studies (Maenner & Durkin, 2010). One possibility for this discrepancy could be due to insufficient awareness and sensitivity of caregivers and educators with regards to the presentation of autistic traits in children, thus the affected children are more likely to be identified at school age when facing more complex social context. While a complete evaluation provides a more accurate clinical judgment, screening tools that highlight autism-specific behavior could be helpful for the first step identification (Baird et al., 2001; Greenspan et al., 2008). As a result, there is an urgent need for an efficient screening tool for ASD that allows detection of even less severe autistic traits, for the use of further intervention. A questionnaire-based approach is considered to be ideal for conducting screening surveys on the general population for its advantage of easy administration and comprehensive personal information provided by the subjects rather than relying on clinical observation by professionals. However, such an approach relies on respondents' understanding of the items' description and often has cultural consideration (Delroy & Simine, 2007; Fombonne, Marcin, Bruno, Tinoco, & Marquez, 2012; Glascoe, 1997; McDonald, 2008). Therefore, before applying such a questionnaire in Taiwan, there is necessary to translate and validate it appropriately (Schanding, Nowell, & Goin-Kochel, 2011).

The common level one screening instruments for individuals with ASD include the Checklist for Autism in Toddlers (CHAT) (Baron-Cohen, Allen, & Gillberg, 1992), the Modified Checklist for Autism in Toddlers (M-CHAT) (Robins, Fein, Barton, & Green, 2001), the Quantitative Checklist for Autism in Toddlers (Q-CHAT) (Allison et al., 2008), the Pervasive Developmental Disorders Screening Test, Second Edition (PDDST-II) (Baird et al., 2001; Filipek et al., 2000), the Childhood Asperger Syndrome Test (CAST) (Scott et al., 2002; Williams et al., 2005), the Social Communication Questionnaire (SCQ) (Rutter, Bailey, & Lord, 2003), and the Social Responsiveness Scale (SRS) (Constantino, 2005). All except the Q-CHAT and the SRS are completed by caregivers, by giving dichotomous response for each item. These measures are usually completed within 5–15 min and are designed to detect the risk of autistic condition in their children (Council on Children With, Section on Developmental Behavioral, Bright Futures Steering, & Medical Home Initiatives for Children With Special Needs Project Advisory, 2006). The CAST specifically detects Asperger syndrome and is not recommended for routine use in the general population (Johnson, Myers, & American Academy of Pediatrics Council on Children With Disabilities, 2007). The Q-CHAT is developed to overcome some weakness of the CHAT and M-CHAT, describing the frequency of high risk autistic condition in toddlers. Among these questionnaires, the SRS contains most items and is able to represent the continuity of social response of children and adolescents, in line with the notion that social interaction ability is varied dimensionally in the general population (Weintraub, 2011).

Some autism-specific measures have been translated into Chinese in Taiwan, including the Autism Diagnostic Observation Schedule (ADOS), the Autism Diagnostic Interview-Revised (ADI-R) (Chien et al., 2011; Gau et al., 2012), the SCQ (Gau et al., 2011), the Toddler Autism Screening Questionnaire (Tsai, Soong, & Shyu, 2012), the Developmental Scale for Children with Autism (Chang, 2003), and the Behavioral Rating Scale for Children with Autism (Chang & Wang, 2005). The latter three instruments could be used as self-reported screening tools in autism with well-validated psychometric properties; however, there is lack of sufficient evidence that these scales can be used to screen for other subtypes of ASD, or be applied in general population. We have established the psychometric properties of the Chinese version of the SCQ (Gau et al., 2011), which is widely used in the clinical and research settings for the assessment of the core symptoms of ASD in Taiwan. However, the Chinese SCQ is not suitable to be used as a screening tool for detecting autistic traits in general population.

Individuals with ASD have been observed to have inadequate or unique fashion in social reaction, such as imitative play, eye gazing, and nonverbal expression from infancy (Yirmiya & Charman, 2010). The SRS (also named the Social Reciprocity Scale) is the most recently developed self-report instrument to quantify symptom severity of the social communication deficit in ASD. The SRS highlights the core difficulties of ASD based on DSM-IV diagnostic criteria and clinical observation of children with ASD. Previous studies have investigated and demonstrated good psychometric properties of the SRS (Constantino, 2005). The translated SRS, such as the German version (Bolte, 2011; Bolte, Poustka, & Constantino, 2008) and the Spanish version (Fombonne et al., 2012), had also demonstrated good psychometric properties. Being a well accepted behavioral assessment, the SRS has been considered to be an adequate parallel measurement and widely used in numerous ASD related studies including genetic studies (Campbell, Warren, Sutcliffe, Lee, & Levitt, 2010; Constantino & Todd, 2000; Constantino, Hudziak, & Todd, 2003; Constantino, Zhang, Frazier, Abbacchi, & Law, 2010; De la Marche et al., 2011; Duvall et al., 2007; Warren et al., 2011) and neural imaging studies (Anderson et al., 2011; Assaf et al., 2010; Di Martino et al., 2009; Jou et al., 2011; Paul, Corsello, Tranel, & Adolphs, 2010).

Although the Chinese SCQ has been translated into Chinese and demonstrated as a reliable and valid instrument to assess typical symptoms of autism in clinical subjects, it is not suitable to be used to screen for autistic trait in general population. In