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Examination of the reliability and factor structure of the Autism Spectrum Quotient (AQ) in a non-clinical sample

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Abstract

A self-report screening measure for high functioning autism spectrum disorders is needed for diagnostic screening and research purposes. The Autism Spectrum Quotient (AQ) has been developed for these reasons, although a comprehensive assessment of the psychometric properties of the AQ has not been completed. The purpose of the current study was to assess the distribution, internal consistency, and factor structure of the AQ in a non-clinical sample ($n = 1005$). The current findings demonstrate the normal distribution of autistic traits and support a three-factor structure of the AQ. Additionally, a three-factor version of the AQ yielded somewhat improved internal consistency. Implications of these findings and suggestions for further development of the AQ as a measure of the autism spectrum are offered.

Keywords: Autism Spectrum Quotient; Spectrum disorders; AD; High functioning autism; Autism; Factor analysis

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1. Introduction

Autism spectrum disorders are estimated to affect 60 out of every 10,000 live births. Between 29% and 60% of those affected have normal intelligence (Tidmarsh & Volkmar, 2003). Those with normal intelligence and significant autism traits are diagnosed with Asperger's disorder (AD) or autistic disorder (usually referred to as high functioning autism (HFA) when there is normal intelligence; *Diagnostic and Statistical Manual of Mental Disorders-IV-TR* (*DSM-IV-TR*); American Psychiatric Association (APA), 2000). The symptom domains of HFA are impairments in the autism triad: (a) social interaction, (b) communication, and (c) restricted interests, repetitive behaviors (APA, 2000). The symptom domains of AD involve only two domains of the autism triad – impairment in social interaction and restricted interests, repetitive behaviors. Research is needed to improve our understanding of the diagnostic boundaries and stability of HFA and AD during adulthood. Further, there is a need to know more about factors that produce and maintain optimal functioning, and about the co-occurrence of psychopathology with the disorders.

The Autism Spectrum Quotient (AQ) was developed by Baron-Cohen, Wheelwright, Skinner, Martin, and Clubley (2001a, 2001b) to address this need. The AQ is a 50-item self-report questionnaire that measures autism traits in intellectually normal adults (Baron-Cohen et al., 2001a). It is composed of five domains corresponding to the autism triad and cognitive deficits of autism: (a) social skill, (b) attention switching, (c) attention to detail, (d) communication, and (e) imagination (Baron-Cohen et al., 2001a). The AQ has a Likert scale scoring system (''definitely agree,'' ''slightly agree,'' ''slightly disagree,'' ''definitely disagree''); however, the Likert scale values are typically collapsed into two categories (''agree'' and ''disagree''). The latter is the recommended scoring procedure.

Use of the AQ in autism research has produced several potentially important findings. First, AQ scores have been shown to be stable cross-culturally with Japanese (Wakabayashi, Baron-Cohen, Wheelwright, & Tojo, 2006) and Austrian samples (Voracek & Dressler, 2006). Second, AQ scores have been associated with scientific ability (Baron-Cohen et al., 2001a), social cognition (Bayliss & Tipper, 2005), and schizotypal personality (Hurst, Nelson-Gray, Mitchell, & Kwapil, in press). Third, the AQ demonstrated good diagnostic validity (sensitivity = 0.95, specificity = 0.52, positive predictive value = 0.84, negative predictive value = 0.78) and was found suitable for screening purposes by Woodbury-Smith, Robinson, Wheelwright, and Baron-Cohen (2005). Fourth, Baron-Cohen et al. (2001a) found that males scored significantly higher than females when the AQ was administered to a combined large sample of randomly recruited control participants and college students. However, Hurst et al. (in press) found no differences between males and females in a large sample of college students. Fifth, and finally, a high heritability for autistic traits in later adolescence has been found in a study conducted in the Netherlands using the AQ (Hoekstra, Bartels, Verweij, & Boomsma, 2007). Taken together, these results are impressive and suggest the AQ is serving an important role in developing our understanding of autistic traits. Given the AQ's importance and potential utility in future research in a variety of domains (e.g., cross-cultural expression of the autism spectrum and behavior genetics), it is crucial that the basic assumptions and psychometrics of this measure be empirically demonstrated. We review the current empirical findings below and the rationale for the current study.