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Relationships between autistic-like and schizotypy traits: An analysis using the Autism Spectrum Quotient and Oxford-Liverpool Inventory of Feelings and Experiences

Suzanna N. Russell-Smith *, Murray T. Maybery, Donna M. Bayliss

Neurocognitive Development Unit, School of Psychology, University of Western Australia, 35 Stirling Hwy., Crawley, WA 6009, Australia

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ABSTRACT

To further investigate claims of a relationship between autism and schizophrenia, the current study examined the associations between specific dimensions of autistic-like and schizotypy traits. These traits were assessed using the Autism Spectrum Quotient and the Oxford-Liverpool Inventory of Feelings and Experiences. After using factor analysis to explore the dimensions of autistic-like and schizotypy traits represented in these measures in two separate groups of students (N_1 = 362, N_2 = 639), the relationships between these dimensions were examined. While the results are consistent with suggestions in the literature of an overlap in the interpersonal deficits associated with autism and schizophrenia, they offer little support for Crespi and Badcock's (2008) claim that autism and positive schizophrenia are diametrically opposed disorders.

1. Introduction

Autism is a disorder characterized by symptoms of impaired social interaction, communication deficits, and restricted and repetitive behaviors or interests. Schizophrenia symptoms are also organized into three categories: positive (e.g., magical ideation, unusual perceptual experiences and paranoia), negative (e.g., flattened affect, social withdrawal, and a lack of enjoyment from usual sources of pleasure), and disorganized (e.g., incoherent thought processes, speech or behavior).While the symptoms of autism are generally considered to be well-defined and distinct from the symptoms of schizophrenia, recent work suggesting that specific subsets of these symptoms are related has revived historical suggestions of a link between these disorders. Importantly, since the symptoms of autism and schizophrenia are found to blend from clinical populations into the general population on a continuum spanning from a disordering level of the symptoms to a total absence of symptoms (e.g., Constantino & Todd, 2003; Mason, Claridge, & Jackson, 1995), the relationships proposed between these disorders are said to extend beyond clinical individuals to also be present in neurotypical individuals with milder levels of these traits (i.e., autistic-like and schizotypy traits). While the current study investigates the full set of relationships between dimensions of autistic and schizotypy traits, it focuses primarily on two specific claims yet to receive sufficient attention in the literature.

1.1. Autism and schizophrenia are diametrically opposed disorders

Crespi and Badcock (2008) have controversially suggested that the autism and positive schizophrenia spectra are diametrically opposed such that individuals at equivalent points on the two spectra display some opposite cognitive, behavioral and biological profiles. This is said to be mediated at least in part by genomic imprinting, whereby autism is characterized by an imbalance toward the expression of paternal genes which promote a general pattern of constrained overgrowth during development while schizophrenia is characterized by an imbalance toward maternal genes which promote a pattern of undergrowth. While still requiring considerable investigation, Crespi and Badcock present a convincing theoretical argument for their theory, and the first study to provide a direct test of their claims provided preliminary empirical support for their position (Russell-Smith, Maybery, & Bayliss, 2010).

1.2. The interpersonal deficits in autism and schizophrenia overlap

Following their finding of a strong positive correlation between students' scores on the Interpersonal subscale of the Schizotypal Personality Questionnaire and Social Skills subscale of the Autism Spectrum Quotient (AQ; Baron-Cohen, Wheelwright, Skinner,

* Corresponding author. Tel.: +61 08 6488 3637.
E-mail address: srussell-smith@graduate.uwa.edu.au (S.N. Russell-Smith).

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Martin, & Clubley, 2001), Hurst, Nelson-Gray, Mitchell, and Kwapil (2007b) argued for an overlap between the negative symptoms of schizophrenia and the interpersonal deficits in autism (see also Rawlings & Locarnini, 2008; Spek & Wouters, 2010; Tordjman, 2008). This suggestion not only has implications for clinicians and researchers attempting to differentiate these symptoms for the purpose of diagnosis or participant selection, but also raises the possibility that treatment of these disorders could be advanced by greater sharing of interventions across the disorders.

1.3. Current study

This study examines the correlations between dimensions of the AQ and Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason, Linney, & Claridge, 2005) in two different student samples to further test the viability of the above claims. Specifically, we provide a test of the replicability of the correlations between specific dimensions of autistic-like and schizotypy traits reported by Hurst et al. (2007b), particularly the strong positive correlation these authors identified between the social dimensions. By using a different measure of schizotypy traits, the current study examines the generalizability of the relationships identified by Hurst et al. Additionally, since it would be reasonable to predict from Crespi and Badcock's (2008) theory that traits on the autism and positive schizophrenia spectra are negatively correlated, the methodology of the current study allows for further investigation of these authors' claims. The recruitment of student samples for the current study is in accord with Crespi and Badcock's recommendation that their theory be evaluated with reference to individuals on the milder points of the autism and positive schizophrenia spectra.

Existing studies already provide some support for a negative correlation between traits or symptoms on the autism and positive schizophrenia spectra. Konstantareas and Hewitt (2001) found that none of their sample of individuals with autism reported experiencing any hallucinations or delusions. Moreover, mathematicians, who are generally found to score highly on autistic-like traits (Baron-Cohen et al., 1998, 2001), are said to report fewer positive schizotypy traits than controls (Nettle, 2006). However, Rawlings and Locarnini (2008) found no association between total levels of autistic-like traits (assessed using the AQ) and levels of positive schizotypy traits (assessed using the 'Unusual Experiences' subscale of the O-LIFE) in a mixed sample of scientists, mathematicians and professional artists. Meanwhile, Hurst et al. (2007b) found scores on the Cognitive-Perceptual subscale of the SPQ to actually correlate positively with total AQ scores.

Some of these contradictory findings may be attributed, at least in part, to the fact that such studies have tended to consider autism to represent a unitary continuum, rather than recognizing the multidimensional nature of the disorder (Dworzynski, Happé, Bolton, & Ronald, 2009). This being said, while Hurst et al. (2007b) investigated the dimensions of autistic-like traits represented in the AQ and found them to vary in the degree to which they relate to positive schizotypy traits, none of these correlations were negative as would be expected from Crespi and Badcock (2008). However, as Hurst et al. are the only researchers to date to have examined the relationship between positive schizotypy traits and specific dimensions of autistic-like traits, further investigation of this relationship is warranted; this is especially the case since Hurst et al. used the five theoretically defined AQ subscales devised by Baron-Cohen et al. (2001), which have received little empirical support in the literature.

An important difference between the current study and that of Hurst et al. (2007b) is, therefore, the use of empirically driven subscales for this study. In fact, disagreement in the literature surrounding the factor structure of the AQ necessitates that it is examined further in the current study before a set of factors can be used confidently to study the relationship between specific subsets of autistic-like and schizotypy traits. To briefly summarize the factor structures previously reported for the AQ, the initial factor analysis conducted by Austin (2005) found it to comprise only three dimensions: (Poor) Social Skills, Details/Patterns, and (Poor) Communication/Mindreading. While other researchers have supported these three factors over Baron-Cohen et al.'s theoretical subscales (e.g., Hurst, Mitchell, Kimbrel, Kwapil, & Nelson-Gray, 2007a), based on a larger sample, Stewart and Austin (2009) have now endorsed a four-factor model for the AQ instead, where the Communication/Mindreading factor is split into 'Understanding Others/Communication' and 'Imagination'. Hoekstra, Bartels, Cath, and Boomsma (2008), on the other hand, have suggested there are only two primary AQ factors, Social Interaction and Attention to Detail.

Additionally, there is some debate about the factor structure of the O-LIFE. In keeping with the notion that schizotypy comprises three or four relatively independent dimensions (Claridge et al., 1996; Vollema & van den Bosch, 1995), the O-LIFE was developed to include three or four subscales (depending on which version is used). While three of these subscales parallel the dimensions of schizophrenia (positive, negative and disorganized) and are considered to be stable traits of schizotypy, the factor structure of the O-LIFE has not been validated since the development of the original scale (Mason, 1995; Mason et al., 1995, 2005). Furthermore, some researchers have questioned where the fourth subscale, Impulsive Nonconformity (O-LIFE:ImpNon), fits within the wider construct of schizotypy and consequently have excluded this dimension (Loughland & Williams, 1997). Given the wide use of the O-LIFE, it is crucial that this subscale is better understood and a consensus is reached as to whether it is a valid component of schizotypy. The factor structure of the O-LIFE is, therefore, also tested here.

While the primary purpose of examining two samples in this investigation is to allow for a test of the replicability of the relationships identified between the dimensions of autistic-like and schizotypy traits, it also provides an opportunity to test whether sample size has contributed to the contradictory factor structures reported to date (particularly for the AQ). In accordance with this, a substantially larger sample was used for Study 2 ($N = 639$) compared to Study 1 ($N = 362$). Another important distinction between the studies is that Study 1 includes only the O-LIFE items from Mason et al.'s (2005) three subscales that most clearly mirror the dimensions of schizophrenia, while Study 2 includes also items from Mason et al.'s O-LIFE:ImpNon subscale. These extra items allow for an empirical test of the validity of schizotypy as a four-dimensional construct, and also enable a check of the robustness of the three major schizotypy subscales when the fourth subscale is added. If support for a fourth dimension is found, the degree to which it relates to the other O-LIFE factors, and the AQ factors, can then be examined.

2. Study 1

2.1. Method

2.1.1. Participants

Participants were 362 undergraduate students (275 females; mean age = 18.7 years; SD = 3.2 years) who were studying first-year psychology as part of a broader degree (e.g., a BSc or BA).

2.1.2. Measures

The AQ (Baron-Cohen et al., 2001) is a 50-item self-report measure used to assess mild autistic-like traits in the general population. We used the four-point AQ scoring system introduced by Austin (2005).