

## **A comparison of the trait emotional intelligence profiles of individuals with and without Asperger syndrome**

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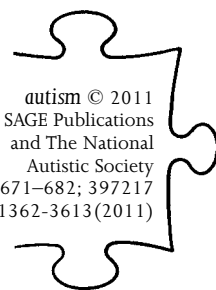
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# A comparison of the trait emotional intelligence profiles of individuals with and without Asperger syndrome

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**ABSTRACT** The extent to which the socioemotional impairments of Asperger syndrome (AS) might be extreme manifestations of individual differences within the general population remains under-explored. We compared the trait emotional intelligence (trait EI) profiles of 30 individuals with AS against the profiles of 43 group-matched controls using the Trait Emotional Intelligence Questionnaire (TEIQue). Participants with AS scored significantly lower than controls on 12 of the 15 TEIQue facets ( $\eta_p^2 = 0.09$  to  $0.49$ ) as well as on all four factors and the global score of the construct ( $\eta_p^2 = 0.07$  to  $0.41$ ). There was a significant main effect of gender, with men generally scoring higher than women. Results are discussed from the perspective of trait EI theory, with emphasis on its implications for the socioemotional impairments associated with AS.

**KEYWORDS**  
Asperger syndrome;  
trait emotional self-efficacy;  
personality;  
insight;  
TEIQue

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Conceptualization of the pervasive developmental disorders (PDDs), including autistic disorder (AD) and Asperger syndrome (AS) among other sub-classifications, has undergone considerable change since the most recent

edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association (APA), 2000). Shared presentation of deficits in social interaction abilities and communication skills, along with behavioural inflexibility, have led these conditions to be considered variant presentations of the same underlying disorder – autism spectrum disorder (ASD; e.g. Frith, 2004; Levy et al., 2009; Wing, 1996). While ASD is currently estimated at around 1% of the population (Levy et al., 2009), conceptualization of a spectrum of impairment suggests that it likely comprises an impairing extension of what is normal individual variation in social-communication skills and behavioural flexibility.

Within existing classification systems, individuals diagnosed with AS might be considered to lie at a region along the autism spectrum nearer the boundary with typical development, while those diagnosed with AD lie further away from it. AS is generally differentiated from AD by typical early language development milestones (APA, 2000; World Health Organization (WHO), 1993) and typical cognitive abilities (Frith, 2004; Ghaziuddin, 2008; Wing, 1981). Whereas most individuals with AD are usually diagnosed in toddlerhood, AS is often only ascertained later in childhood (Levy et al., 2009) or even into adolescence and adulthood for individuals who are very bright and able. As yet, ASDs are diagnosable only on the basis of behavioural presentation (APA, 2000; WHO, 1993). Consequently, it is only when functional difficulties are experienced by an individual (or those around them) that social-communication skills deficits and behavioural inflexibility might point toward an appropriate diagnosis of AS. While around two boys for every girl are diagnosed with AD, in AS the ratio tends to be considerably higher (e.g. 4:1, Levy et al., 2009).

Research into the skills bases of individuals with ASD has tended to focus on identifying group-level deficits compared with the normative population or to individuals with other disorders, and is only recently beginning to adopt an individual differences approach. While a few studies have revealed possible links between AS-type symptoms and personality constructs (e.g., Austin, 2005; Kunihiro et al., 2006; Wakabayashi et al., 2006), these have predominantly sampled from the general population (i.e. typically developed individuals). Other studies have investigated a broader autism phenotype, including personality typologies, within the non-affected family members of individuals with a diagnosis (e.g. Piven et al., 1997). A small number of studies have examined personality profiles in adults with ASDs (Anckarsater et al., 2006; Soderstrom et al., 2002) and temperament profiles in toddlers with ASDs or at high-risk thereof (Garon et al., 2009).

Existing research has shown that, in the general population, scores on the Autism Spectrum Questionnaire (AQ) correlate negatively with extra-

version and agreeableness and positively with neuroticism (Austin, 2005; Wakabayashi et al., 2006). Kunihiro et al. (2006) found that AQ scores correlated positively with depression, anxiety and harm avoidance, and negatively with novelty seeking and reward dependence. This echoed results by Soderstrom et al. (2002) and Anckarsater et al. (2006) who found that individuals with diagnosed AS showed a tendency to score higher than matched controls on harm avoidance, but lower on novelty seeking and reward dependence.

The marriage of individual differences methods with the emerging conceptualization of an autism spectrum can facilitate systematic research at the boundary of typical development and diagnosable ASD. In turn, this may permit clarification of the point at which individual variation in traits and skills becomes functionally problematic. Such research may also contribute to the validation of measures and constructs developed within typical individual difference frameworks (rather than specifically within ASD).

Despite their largely intact language and cognitive abilities, individuals diagnosed with milder variants of ASD (i.e. AS, under current classification) present a range of primary and secondary features, many of which are *prima facie* relevant to individual differences variables relating to emotions. A comprehensive operationalization of such variables is provided by the construct of trait emotional intelligence (trait EI or trait emotional self-efficacy), which is defined as a constellation of emotional self-perceptions located at the lower levels of personality hierarchies (Petrides et al., 2007). Trait EI is conceptualized as wholly independent of cognitive ability and has demonstrated associations with affective decision making (Sevdalis et al., 2007), psychopathology (Williams et al., 2010), resting electroencephalographic activation (Mikolajczak et al., 2010) and reaction time (Austin, 2009). A growing number of studies have revealed incremental effects of trait EI over and above established personality traits and related variables (Petrides et al., 2007).

Various aspects of emotional functioning, including accurate perception and spontaneous recognition of complex emotions, flexible comprehension and use of these, and appropriate responsiveness towards others' emotions have been shown to be impaired in AS samples (e.g., Baron-Cohen and Wheelwright, 2004; Golan et al., 2006; Roeyers et al., 2001; Wing, 1981). Trait EI encompasses all of these and many other aspects of emotional functioning that have been shown to be impaired in AS (e.g. social skills and adaptability) in the form of self-perceptions.

Rather than being socially withdrawn (as is often seen in more severely impaired individuals with AD), those with AS often seek social companionship, but struggle due to their inherent difficulties in understanding subtle rules of social engagement and emotion (Klin et al., 2005). While intact

cognitive skills often permit them to develop coping strategies allowing some compensation for their social difficulties (e.g. Frith, 2004; Lindner and Rosen, 2006; Zalla et al., 2009), the complexity of cues present in social interactions and the requirement for rapid information processing means that even the most able individuals with AS present awkwardly in social situations (e.g. Frith, 2004; Roeyers et al., 2001).

Intact cognitive abilities may also afford individuals with AS a certain level of insight into their social difficulties (Frith, 2004). The individual may be aware that they are unable to engage socially with the same ease that is apparent in others' interactions, which may lead to comorbid emotional symptoms. Indeed, high stress, anxiety and depression are regularly present in this population (e.g. Attwood, 2007; Ghaziuddin, 2005; Tantam, 1988; Wing, 1981). Interestingly, such emotional features have also been shown to be characteristic of individuals with low trait EI in the general population (Martins et al., 2010).

There is ample scope for a detailed investigation into the links between AS and trait EI, given the recent conceptualization of a spectrum of autism disorders continuous with normative development. Furthermore, application of a normative individual differences approach may shed light on the gender discrepancy routinely observed in ASD, particularly in those more able individuals diagnosed with AS. The present study, therefore, compares the trait EI profiles of men and women diagnosed with AS with those of a normative sample, group-matched on age and gender, using the Trait Emotional Intelligence Questionnaire (TEIQue). Participants with AS were expected to evidence lower trait EI than typically developing controls on most facets of the TEIQue. In line with existing evidence (see Petrides, 2009), we did not expect extensive gender differences in global trait EI scores in the control group, but were interested to explore this issue in the AS group.

## Method

### Participants

Thirty adults diagnosed with AS (16 women and 14 men) volunteered to participate in the study and were subsequently group-matched with 43 typically developing adults (22 women and 21 men). Individuals diagnosed with AS were approached through communication with the National Autistic Society, AS-related communities in Britain, and relevant internet forums. Eligibility was based on diagnosis of AS by at least one registered psychologist, psychiatrist, or paediatrician (typically on the basis of International Classification of Diseases (ICD)-10 criteria in the UK; WHO, 1993) as supplied by the participants.

The control group was randomly drawn from the TEIQue UK normative database ( $N = 2254$ ) after applying constraints to achieve group-wise matching on average chronological age and a balanced male:female ratio, which are the most widely used matching variables in autism research (Motttron, 2004). More specifically, we first excluded from the normative database all participants aged below 19 or above 73 years (i.e., those outside the age range of the Asperger group). This resulted in a dataset comprising 1841 individuals whence we randomly selected approximately 2.5% cases to form the comparison sample in the study. The matching process was conducted entirely independently of the study hypotheses. A between-subjects *t*-test showed no significant differences in the mean age of participants with and without AS,  $t(68) = 1.29$ ,  $p = .200$ . In addition, there were no significant between-group differences in the distribution of gender,  $\chi^2(1) = 0.14$ ,  $p = .705$  or marital status,  $\chi^2(5) = 9.05$ ,  $p = .107$ .

### Measures and procedure

We used TEIQue v. 1.50 (Petrides, 2009), a 153-item inventory covering 15 emotion-related facets (see Table 1 for descriptions and sample items). It has been shown to have satisfactory psychometric properties in various studies (e.g. Freudenthaler et al., 2008). Internal consistencies (Cronbach's  $\alpha$ ) in the present study were generally acceptable in both groups, as expected (see Table 2). Participants gave informed consent, completed the questionnaire anonymously and individually, and were subsequently debriefed.

### Results

First, we computed a univariate ANOVA with global trait EI as the dependent variable and participant group (AS versus control) and gender as the independent variables (descriptive statistics are reported in Table 2). The results showed that controls had significantly higher scores than participants with AS,  $F(1, 73) = 45.58$ ,  $p < .001$ ,  $\eta_p^2 = 0.40$ , and that men had significantly higher scores than women,  $F(1, 73) = 4.87$ ,  $p = .031$ ,  $\eta_p^2 = 0.07$ . The interaction between participant group and gender did not reach significance,  $F(1, 73) = 2.64$ ,  $p = .109$ .

In the light of the significant effects on the global trait EI score, we conducted a multivariate analysis of variance (MANOVA) with the four TEIQue factors as the dependent variables and participant group and gender as the independent variables (see Table 2 for descriptive statistics). There was a significant main effect of group,  $F(4, 66) = 15.60$ ,  $p < .001$ ,  $\eta_p^2 = 0.49$ , with controls scoring significantly higher than the AS group on Self-control,  $F(1, 73) = 5.16$ ,  $p = .026$ ,  $\eta_p^2 = 0.07$ , Well-being,  $F(1, 73) = 14.65$ ,  $p < .001$ ,  $\eta_p^2 = 0.17$ , Sociability,  $F(1, 73) = 48.10$ ,  $p < .001$ ,  $\eta_p^2 = 0.41$ , and

**Table 1** The sampling domain of trait emotional intelligence in adults

<i>Facets</i>	<i>High scorers view themselves as . . .</i>	<i>Sample item</i>	<i>Number of items</i>
<i>Adaptability</i>	. . . flexible and willing to adapt to new conditions.	I usually find it difficult to make adjustments to my lifestyle (R)	9
<i>Assertiveness</i>	. . . forthright, frank and willing to stand up for their rights	When I disagree with someone, I usually find it easy to say so	9
<i>Emotion expression</i>	. . . capable of communicating their feelings to others	Others tell me that I rarely speak about how I feel (R)	10
<i>Emotion management (others)</i>	. . . capable of influencing other people's feelings	I'm usually able to influence the way other people feel	9
<i>Emotion perception (self and others)</i>	. . . clear about their own and other people's feelings	I often find it difficult to recognize what emotion I'm feeling	10
<i>Emotion regulation</i>	. . . capable of controlling their emotions	When someone offends me, I'm usually able to remain calm	12
<i>Empathy</i>	. . . capable of taking someone else's perspective	I find it difficult to understand why certain people get upset with certain things (R)	9
<i>Happiness</i>	. . . cheerful and satisfied with their lives	Life is beautiful	8
<i>Impulsiveness (low)</i>	. . . reflective and less likely to give in to their urges	I tend to get 'carried away' easily (R)	9
<i>Optimism</i>	. . . confident and likely to 'look on the bright side' of life	I generally believe that things will work out fine in my life	8
<i>Relationships</i>	. . . capable of maintaining fulfilling personal relationships	I generally don't keep in touch with friends (R)	8
<i>Self-esteem</i>	. . . successful and self-confident	I believe I'm full of personal strengths	11
<i>Self-motivation</i>	. . . driven and unlikely to give up in the face of adversity	I tend to get a lot of pleasure just from doing something well	10

*Continued opposite*

**Table 1 Continued**

<i>Facets</i>	<i>High scorers view themselves as . . .</i>	<i>Sample item</i>	<i>Number of items</i>
<i>Social awareness</i>	. . . accomplished networkers with superior social skills	I can deal effectively with people	11
<i>Stress management</i>	. . . capable of withstanding pressure and regulating stress	I'm usually able to deal with problems others find upsetting	10

Note: (R): reverse-coded item.

Emotionality,  $F(1, 73) = 52.44$ ,  $p < .001$ ,  $\eta_p^2 = 0.43$ . There was also a significant main effect of gender,  $F(4, 66) = 3.29$ ,  $p = .016$ ,  $\eta_p^2 = 0.17$ , with men scoring significantly higher than women on Well-being,  $F(1, 73) = 4.54$ ,  $p = .037$ ,  $\eta_p^2 = 0.06$  and Sociability,  $F(1, 73) = 9.54$ ,  $p = .003$ ,  $\eta_p^2 = 0.12$ . The interaction between participant group and gender did not reach significance,  $F(4, 66) = 0.88$ ,  $p = .481$ .

Lastly, in order to explore these findings in greater detail, we carried out another MANOVA with the 15 trait EI facets as the dependent variables and participant group and gender as the independent variables (see Table 2 for descriptive statistics). Results for the overall analysis showed a significant main effect of group,  $F(15, 55) = 8.02$ ,  $p < .001$ , with a large effect size,  $\eta_p^2 = 0.69$ .

Inspection of the follow-up ANOVAs showed that control participants had significantly higher ratings than participants with AS on 12 of the 15 TEIQue facets, namely (by ascending order of effect size): Self-esteem,  $F(1, 72) = 7.05$ ,  $p = .010$ ,  $\eta_p^2 = 0.09$ , Emotion expression,  $F(1, 72) = 7.80$ ,  $p = .007$ ,  $\eta_p^2 = 0.10$ , Happiness,  $F(1, 72) = 8.84$ ,  $p = .004$ ,  $\eta_p^2 = 0.11$ , Stress management,  $F(1, 72) = 12.35$ ,  $p = .001$ ,  $\eta_p^2 = 0.15$ , Relationships,  $F(1, 72) = 15.61$ ,  $p < .001$ ,  $\eta_p^2 = 0.19$ , Optimism,  $F(1, 72) = 17.00$ ,  $p < .001$ ,  $\eta_p^2 = 0.20$ , Assertiveness,  $F(1, 72) = 22.88$ ,  $p < .001$ ,  $\eta_p^2 = 0.25$ , Social awareness,  $F(1, 72) = 39.39$ ,  $p < .001$ ,  $\eta_p^2 = 0.36$ , Emotion management,  $F(1, 72) = 40.66$ ,  $p < .001$ ,  $\eta_p^2 = 0.37$ , Adaptability,  $F(1, 72) = 43.17$ ,  $p < .001$ ,  $\eta_p^2 = 0.39$ , Empathy,  $F(1, 72) = 55.98$ ,  $p < .001$ ,  $\eta_p^2 = 0.45$ , and Emotion perception,  $F(1, 72) = 64.91$ ,  $p < .001$ ,  $\eta_p^2 = 0.49$ .

The MANOVA results also showed a significant main effect of gender,  $F(15, 55) = 1.95$ ,  $p = .037$ ,  $\eta_p^2 = 0.35$ , with men scoring significantly higher than women on Emotion management,  $F(1, 72) = 4.93$ ,  $p = .030$ ,  $\eta_p^2 = 0.07$ , Social awareness,  $F(1, 72) = 6.83$ ,  $p = .011$ ,  $\eta_p^2 = 0.09$ , Self-esteem,  $F(1, 72) = 7.58$ ,  $p = .008$ ,  $\eta_p^2 = 0.10$ , Stress management,  $F(1,$



**Table 2** Trait Emotional Intelligence Questionnaire descriptive statistics for the Asperger syndrome and control groups

	Asperger group				Control group					
	Men		Women		Men		Women			
	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>		
	M	SD	M	SD	M	SD	M	SD		
<i>Facets</i>										
Adaptability	0.85	2.98	1.43	2.68	0.99	0.70	4.49	0.88	4.35	0.76
Assertiveness	0.60	4.12	0.89	3.66	0.85	0.43	5.06	0.69	4.44	0.65
Emotion expression	0.82	3.88	1.34	3.56	1.20	0.85	4.45	1.37	4.71	1.24
Emotion management (in others)	0.64	3.99	0.91	3.24	0.80	0.71	4.87	0.72	4.78	0.79
Emotion perception	0.78	3.64	1.06	2.77	0.79	0.67	4.87	0.98	4.93	0.68
Emotion regulation	0.79	3.94	1.18	3.86	0.93	0.87	4.36	1.00	4.13	0.74
Empathy	0.80	3.50	1.30	3.29	1.21	0.61	4.93	0.69	5.22	0.59
Happiness	0.90	4.85	1.38	4.06	1.50	0.93	5.29	1.09	5.37	1.03
Impulsiveness (low)	0.60	4.35	0.77	4.04	1.12	0.66	4.16	0.90	4.43	0.64
Optimism	0.81	4.52	1.07	3.98	1.15	0.70	5.24	0.84	5.08	0.70
Relationships	0.68	4.49	1.14	4.22	0.96	0.74	5.22	0.66	5.19	0.87
Self-esteem	0.84	4.77	0.83	3.76	1.24	0.64	4.94	0.88	4.75	0.75
Self-motivation	0.62	4.78	0.58	4.50	1.06	0.39	4.70	0.87	4.74	0.59
Social awareness	0.81	3.77	1.15	2.88	0.88	0.68	4.84	0.81	4.57	0.86
Stress management	0.78	3.99	0.95	3.25	1.04	0.76	4.59	0.76	4.15	0.87
<i>Factors</i>										
Well-being	0.85	4.72	0.92	3.93	1.18	0.70	5.16	0.81	5.06	0.58
Self-control	0.76	4.09	0.79	3.72	0.86	0.72	4.37	0.75	4.23	0.58
Emotionality	0.73	3.88	0.97	3.46	0.66	0.67	4.87	0.70	5.01	0.61
Sociability	0.85	3.96	0.84	3.26	0.75	0.75	4.92	0.60	4.60	0.63
Global trait EI	0.89	4.10	0.65	3.58	0.64	0.87	4.80	0.58	4.72	0.44

Notes: EI: emotional intelligence.

72) = 7.72,  $p = .007$ ,  $\eta_p^2 = 0.10$ , and Assertiveness,  $F(1, 72) = 9.03$ ,  $p = .004$ ,  $\eta_p^2 = 0.12$ . The interaction between participant group and gender did not reach significance,  $F(15, 55) = 1.15$ ,  $p = .338$ .

## Discussion

The extent to which the socioemotional impairments in AS might be extreme manifestations of the individual variability seen in the personality traits of typically developing adults remains an unexplored field of inquiry. Consistent with the suggestion that multiple dimensions from the trait EI framework may be relevant to our understanding of this issue, the results showed that individuals with AS had significantly lower scores on most TEIQue variables, including the global score. This was expected given that the difficulties encountered by AS individuals appear to align closely with many trait EI facets, such as emotion expression, emotion perception, social awareness and empathy (Attwood, 2007; Gillberg, 1989). The significant differences in trait EI reported here, yielding very large effect sizes between individuals with and without AS, are in line with the excellent construct validity that the TEIQue has shown in multiple studies (for a meta-analysis focusing on health, see Martins et al., 2010).

We must steer clear of the temptation to interpret the findings from the barren 'EQ is good for you' perspective that would risk us labelling individuals with AS as 'emotionally unintelligent'. The subjective nature of emotional experience prevents the operationalization of emotional intelligence as a mental ability (Brody, 2004; Freudenthaler and Neubauer, 2007). In fact, the current group with AS showed clear evidence of socio-cognitive insight into their difficulties, scoring lower than typically developing controls on a range of relevant TEIQue facets. The capacity for such insight has been commented on by some authors (e.g. Frith, 2004), but has hitherto received little direct research attention. The lower scores of this group on facets such as happiness and self-esteem are also consistent with the fact that many individuals with AS experience mental health concerns resulting in poorer life outcomes (Attwood, 2007; Ghaziuddin, 2005).

There were only small differences in trait EI facets relating to self-control. This is in agreement with Koning and Magill-Evans (2001), who found that parents and teachers rated students with AS as having low self-control, even though the students did not rate themselves significantly lower than controls. These results suggest that, in direct contrast to others' views, individuals with AS perceive themselves as adequately self-controlled. Alternatively, it could be argued that individuals with AS lack adequate awareness of their impaired self-control (Koning and Magill-Evans, 2001). The latter explanation, however, is inconsistent with the other findings of our

study, all of which suggested that the current AS sample were aware of their socioemotional limitations.

With respect to gender, males scored higher than females, albeit with small effect sizes. This pattern was evident in both the control and the AS group: thus, there were no interactions between gender and group. The differences mainly concerned facets that are generally perceived as 'masculine', such as assertiveness, emotion management (of others), self-esteem, and stress management. In this respect, the results align with those reported in the TEIQue UK normative sample (Petrides, 2009), with perhaps the only notable deviation concerning the absence of any tendency for the women with AS to score higher than their male counterparts on the more 'feminine' TEIQue facets, such as relationships and empathy.

Although previous studies have rarely included samples of women with AS (as this diagnosis is more common among men; Ehlers and Gillberg, 1993), these data suggest that the female phenotype of AS may be associated with greater impairment than the male phenotype (Gillberg, 1989). It is also possible that women with AS score lower than expected on trait EI because they are more aware that they are contravening social norms of 'feminine' behaviour. These explanations are speculative in relation to our particular sample that is small, indeed vastly smaller than the TEIQue UK normative sample mentioned above. Nevertheless, they provide a useful platform for the generation and testing of hypotheses in future research.

An important strength of the study is that it presents the first examination of trait EI with reference to ASD using a comprehensive and theory-driven measure of the construct. The findings have theoretical implications for conceptualizations of ASD and research into trait EI alike. Crucially, individuals with AS appear to show clear awareness of their trait EI deficits, which is, in itself, adaptive and adds to their largely intact sense of self-control.

Two limitations should be noted, viz. the self-reported diagnosis of the AS group and the lack of direct measurement of cognitive ability (IQ). Inclusion of diagnostic assessment results and IQ test scores could have permitted initial confirmation of AS diagnoses for this group and also provided an index of symptom severity. Such a severity metric could then have been included in the analyses to evaluate the extent to which trait EI profiles are associated with examiner observations of AS severity, thus cross-validating the results.

These limitations notwithstanding, the findings showed that individuals with AS had lower trait EI scores than control participants, which is consistent with the clinical presentation of the condition. AS involves deficits that are directly relevant to the constellation of emotional self-perceptions encompassed by trait EI. Given the rising numbers of children and adolescents

being diagnosed with AS, it becomes increasingly important to define the key symptoms and deficits of the syndrome (Ghaziuddin, 2008), and to understand how these fit with the natural individual variability observed in the general population.

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