Temperament and character in men with autism spectrum disorder: A reanalysis of scores on the Temperament and Character Inventory by individual case matching

Richard Vuijk[a,*], Pieter F.A. de Nijs[b], Mathijs Deen[c,d], Salvatore Vitale[e,1], Mirjam Simons-Sprong[a,2], Michiel W. Hengeveld[e]

[a] Sarr Expertise Center for Autism, Parnassia Groep, Bavo Europoort, Oudedijk 76, 3062 AG, Rotterdam, the Netherlands
[b] Erasmus MC, Sophia Children's Hospital, Department of Child and Adolescent Psychiatry/Psychology, Wytemaweg 80, 3015 CN, Rotterdam, the Netherlands
[c] Parnassia Psychiatric Institute, Kiwistraat 32, 2552 DH, The Hague, the Netherlands
[d] Institute of Psychology, Methodology and Statistics Unit, Leiden University, Wassenaarseweg 52, 2333 AK, Leiden, the Netherlands
[e] Erasmus MC, Department of Psychiatry, 's Gravendijkwal 230, 3015 CE, Rotterdam, the Netherlands

A R T I C L E   I N F O

A B S T R A C T

Background: Interest in autism spectrum disorders (ASD) in adulthood is increasing. Although a person may be diagnosed with ASD, the diagnosis reveals little about the individual's temperament, character, and personality. Also, relatively little is known about the personality of adults with ASD.
Method: A reanalysis of scores on the Temperament and Character Inventory (TCI) administered to a group of 66 normally intelligent men aged 18–63 years, diagnosed with ASD, by individual case matching to a comparison group of 66 men from the general population drawn from the TCI manual.
Results: Compared to the comparison group, men with ASD scored significantly higher on the scale for Harm Avoidance, and lower on Novelty Seeking, Reward Dependence, Self-Directedness, and Cooperativeness.
Conclusions: In this study the score pattern for temperament and character found in men with ASD by individual case matching confirms and strengthens earlier general group matching findings emerging from our 2012 study and from studies from Sweden and the Netherlands.

1. Introduction

There has been growing interest in the personality of individuals diagnosed with an autism spectrum disorder (ASD); this is a neurodevelopmental syndrome with a clinical presentation and characterization of persistent deficits in social communication and social interaction, as well as restricted and repetitive patterns of behavior, interests and/or activities [1]. The disorder has an estimated prevalence of 1% [2,3] and a high prevalence of comorbid psychiatric disorders [4]. Examining personality is more or less a new perspective in the '*multiplicity of autism realities*' [5], alongside the already familiar ideas about ASD, such as an inability to read other people's minds [6], a disorder of executive functioning [7], a disorder of weak central coherence [8] and an excess of 'systemizing' drives at the expense of 'empathizing' drives [9], all leading to a '*spectrum of needs, services, and challenges*' [10]. Dell'Osso

et al. [11] also suggested an adult autism spectrum model that encompasses ASD symptoms, behavioral traits, and personality features.

Although examining personality in persons with ASD is in its infancy, this is a growing area of research. Recently, specific personality profiles in adults with ASD have been both examined and demonstrated, revealing an interrelatedness between ASD and personality dimensions and traits, as well as associations with psychopathology [12,13]. On the Five-Factor Model of personality [14], positive correlations were found between ASD (severity) and neuroticism, and negative correlations between ASD (severity) and extraversion, openness to experience, agreeableness and conscientiousness [15–21]. In studies examining temperament (largely stable and heritable dimensions of personality) and character (the environmental dimension of personality), ASD has been linked to an introvert, rigid, passive-dependent temperament, and a poorly developed character [22–24], indicating a

---

risk for personality disorder. Studies examining personality disorder comorbidity in adults with ASD found high prevalence rates for especially cluster A and C personality disorders [22,25–27], ranging from 48% [27] to 62% [25]. To our knowledge, Kirchner et al. [28] were among the first to examine character strengths in adults with ASD, finding open-mindedness, authenticity, love of learning, creativity and fairness as the most frequent signature strengths.

Identifying personality traits might help to: i) explain the heterogeneity in the functioning of persons with ASD [29], ii) contribute to recognizing both the strengths and weaknesses of these individuals, and iii) may be of added value for the development of new treatment strategies and interaction styles [30]. Understanding personality can lead to a different perception of a person with ASD, i.e. by not merely seeing someone who has an ASD classification, but also seeing an individual with a distinct personality.

2. The present study

Based on a study we published in a Dutch journal [31] and on three earlier studies in which ASD male participants were generally group matched [22–24] we wanted to know if same results would be obtained by individual case matching. We thus hypothesized that men with ASD would score differently on the Temperament and Character Inventory (TCI [33]) compared to a comparison group: i.e. i) lower on Novelty Seeking, ii) higher on Harm Avoidance, iii) lower on Reward Dependence, iv) lower on Self-Directedness, and v) lower on Cooperativeness.

This study, a reanalysis of our 2012 data set, aimed to fill a gap in investigating self-rated temperament and character dimensions in a relatively large group of men with ASD, *individually* matched as closely as possible on age, education and marital status to a comparison group of men, and sought to confirm and strengthen previous findings from our study published in Dutch [31] as well as TCI studies from Anckarsäter et al. [22], Sizoo et al. [23], and Soderstrom et al. [24] in male adults with ASD who were *generally* matched to a norm group.

3. Methods

3.1. Participants

The ASD group consisted of 66 men aged 18–63 (mean 38) years, with an IQ of at least 85 and/or having attended primary school for at least 8 years. All were diagnosed for the first time with a DSM-IV-TR [34] pervasive developmental disorder during an ASD assessment by psychiatrists and psychologists specialized in ASD assessment (the latter supervised by RV from Sarr Expertise Center for Autism, or by SV from Erasmus MC, Department of Psychiatry).

The diagnosis of ASD was based on three in-person interview sessions, plus one or two sessions of interviewing the adult's childhood caregiver and/or partner (if applicable) exploring the symptoms in terms of the DSM criteria (for ASD, as well as for other psychiatric disorders). ASD symptoms were also observed and checked in interaction between the participant and the psychologist and the psychiatrist during the three in-person interview sessions. In a fourth session with the participant, the TCI was a standard part of the assessment to acquire an impression of temperament and character. Finally, in each case, the ASD diagnosis was assigned by one of the two authors (RV, SV), both specialized in ASD in adults, after consensus discussions with the psychiatrists and the psychologists.

Table 1 presents demographic information on the participants and the comparison group. The majority of participants were Caucasian Dutch (98.5%); 50% were single and 35% had a partner (15% unknown). Educational levels ranged from elementary school (3.0%) to university (7.8%), with the majority having followed lower secondary education (34.8%). In terms of comorbidity, five (7.6%) participants were diagnosed with personality disorder, five (7.6%) with partner-relational problems, four (6.1%) with attention-deficit/hyperactivity

Table 1
Characteristics of men with autism spectrum disorder (ASD) and the matched comparison group.

	ASD group	Comparison group
Age in years: mean, range (SD)	38, 18–63 (12.5)	39, 20–63 (11.84)
Male gender, n	66	66
Ethnicity, n (%)		
- Caucasian	65 (98.5%)	66 (100%)
- Asian	1 (1.5%)	–
Marital status, n (%)		
- Married	20 (30.3%)	43 (65.0%)
- Living together	3 (4.5%)	9 (13.6%)
- No partner	33 (50.0%)	12 (18.2%)
- Unknown	10 (15.2%)	2 (3.0%)
Education, n (%)		
- Elementary school only	2 (3.0%)	2 (3.0%)
- Lower secondary education	23 (34.8%)	23 (34.8%)
- Lower vocational education	14 (21.2%)	15 (22.7%)
- Upper secondary school	9 (13.6%)	9 (13.6%)
- Higher vocational education	11 (16.7%)	11 (16.7%)
- University	5 (7.8%)	6 (9.1%)
- Unknown (IQ ≥ 85)	2 (3.0%)	–
ASD diagnosis, n (%)		
- Autistic Disorder	15 (22.7%)	–
- Asperger's Disorder	25 (37.9%)	–
- PDD-NOS	26 (39.4%)	–
Comorbidity, n (%)		
- Personality Disorder	5 (7.6%)	–
- Partner relational problems	5 (7.6%)	–
- ADHD	4 (6.1%)	–
- Depressive Disorder	2 (3.0%)	–
- Psychotic Disorder	1 (1.5%)	–

PDD-NOS = Pervasive Developmental Disorder-Not Otherwise Specified, ADHD = Attention-Deficit/Hyperactivity Disorder.

disorder (ADHD), two (3.0%) with depressive disorder, and one (1.5%) with psychotic disorder.

The comparison group was a well-defined group drawn from a norm group available in the Dutch manual of the TCI [35] individually matched with the ASD group. The comparison group consisted of men from the general population resident in the Netherlands and Flanders (n = 66), mean age 39 (SD 11.84, range 20–63) years, matched on age, education and marital status with the ASD group.

In comparison to our 2012 study in this study we made the two groups more similar demographically, with equal sample sizes and matched (as closely as possible) on age, marital status, and education. If more matches on age, marital status, and education were available, or if there was no unique match, a random number generator was used to select between the available matches. Although statistical methods are available to match between two groups (e.g. propensity score matching), the matched variables were not defined in exactly the same way. Therefore, we matched using a random number generator.

3.2. Measures

The Dutch (translated) version of the Temperament and Character Inventory (TCI [33]) is a self-report questionnaire to determine differences between individuals on seven dimensions of temperament and character, based on Cloninger's psychobiological theory of personality [33]. The TCI consists of 240 items (true/false), four temperament scales (Novelty Seeking, Harm Avoidance, Reward Dependence, and Persistence), three character scales (Self-Directedness, Cooperativeness, and Self-Transcendence), and 25 subscales.

Novelty Seeking is associated with exploratory activity in response to a novel stimulation, impulsive decision-making, extravagance and disorderliness. Harm Avoidance is characterized by excessive worrying, pessimism, shyness, being fearful and easily fatigued, with introversion at one end and extraversion at the other end of the spectrum. Reward Dependence is a tendency to respond to signals of reward of social