



Depression and anxiety symptoms in children and adolescents with autism spectrum disorders without intellectual disability

John F. Strang^{a,*}, Lauren Kenworthy^a, Peter Daniolos^a, Laura Case^b, Meagan C. Wills^a, Alex Martin^b, Gregory L. Wallace^b

^aCenter for Autism Spectrum Disorders, Children's National Medical Center, Washington, DC, United States

^bLaboratory of Brain & Cognition, National Institute of Mental Health, Bethesda, MD, United States

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ABSTRACT

Recent studies have shown that rates of depression and anxiety symptoms are elevated among individuals with autism spectrum disorders (ASDs) of various ages and IQs and that depression/anxiety symptoms are associated with higher IQ and fewer ASD symptoms. In this study which examined correlates of depression and anxiety symptoms in the full school-age range of children and adolescents (age 6–18) with ASDs and IQs ≥ 70 ($n = 95$), we also observed elevated rates of depression/anxiety symptoms, but we did not find higher IQ or fewer ASD symptoms among individuals with ASDs and depression or anxiety symptoms. These findings indicate an increased risk for depression/anxiety symptoms in children and adolescents with ASDs without intellectual disability, regardless of age, IQ, or ASD symptoms.

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1. Introduction

Children with autism spectrum disorders (ASDs) have weaknesses in social reciprocity, communication, and repetitive behaviors (American Psychiatric Association, 1994). Psychiatric co-morbidities are prevalent, with secondary psychopathology occurring in as many as 72% of children with ASDs (Leyfer et al., 2006). Depression and anxiety are among the most common ASD co-morbidities (e.g., Simonoff et al., 2008), and have been shown to relate to significantly poorer life functioning (Mattila et al., 2010). Emotional co-morbidities may also increase the core symptoms of ASDs (Matson & Nebel-Schwalm, 2006; Perry, Marston, Hinder, Munden, & Roy, 2001). There is growing interest in understanding the nature of depression and anxiety in ASDs (e.g., White, Oswald, Ollendick, & Scahill, 2009; Whitehouse, Durkin, Jaquet, & Ziatas, 2009), including exploring potential profiles of vulnerability and contributory factors.

Several studies have reported associations between age and emotional symptoms in children with ASDs. For example, Ghaziuddin, Weidmer-Mikhail, & Ghaziuddin (1998) reported clinical observations of increased rates of depression for young people with ASDs as they entered adolescence. In a study of young people with ASDs, without intellectual disability, higher age related to lower self-perceived social competence, which in turn related to increased self-reported depression symptoms (Vickerstaff, Heriot, Wong, Lopes, & Dossetor, 2007). Higher age also correlated with elevated parent-ratings of anxiety for children and adolescents with ASDs and a broad range of IQs (Lecavalier, 2006).

* Corresponding author at: Center for Autism Spectrum Disorders, Children's National Medical Center, 15245 Shady Grove Road, Suite 350, Rockville, MD 20850, United States. Tel.: +1 301 765 5447; fax: +1 301 765 5497.

E-mail address: jstrang@cnmc.org (J.F. Strang).

Several studies have specifically investigated the relationship between IQ, autism symptoms, and depression and/or anxiety in ASDs (Bellini, 2004; Burnette et al., 2005; Cederlund, Hagberg, & Gillberg, 2010; Mazurek & Kanne, 2010; Sterling, Dawson, Estes, & Greenson, 2008; Sukhodolsky et al., 2008; Vickerstaff et al., 2007; Weisbrot, Gadow, DeVincent, & Pomeroy, 2005). A large study of children and adolescents with ASDs and a broad range of intellectual functioning showed higher IQ and fewer autism symptoms related to greater parent report of anxiety and depression (Mazurek & Kanne, 2010). This same pattern was observed in adults with ASDs and a broad range of IQ regarding depression assessed by a clinician, and the relationship remained when participants with intellectual disability were removed from the analyses (Sterling et al., 2008). A second study of young adults, ages 16–36, without intellectual disability did not duplicate the relationship (Cederlund et al., 2010); the authors considered whether the high level of parent support might have skewed their findings.

A potential link between greater self-awareness of one's social difficulties and depression was first suggested by Wing (1992), who noted that young people with ASDs who are sufficiently self-aware to realize their social struggles are likely to experience increased emotional pain over their social failures. One study reported higher IQ and fewer autism symptoms to relate to increased self-awareness in adolescents with ASDs; the authors suggested that findings of relationships between IQ, autism symptoms, and emotional difficulties might reflect the impact of self-awareness on emotional functioning (Sterling et al., 2008). Self-awareness deficits may also skew self-report of emotional symptoms, as seen when parents endorse significantly greater emotional symptoms than their children report (e.g., Vickerstaff et al., 2007). In one study comparing parent ratings and child self-report of emotional symptoms, self-ratings were in the non-clinical (normal) range, while parent report was significantly elevated (Nicpon, Doobay, & Assouline, 2010), although this finding is not universal (e.g., Hurtig et al., 2009).

To fully understand the relationship of age to emotional symptoms in higher functioning ASD it is helpful to study a group with an adequate number of children across a wide age range. While providing important insight into the relationship of intelligence and age to emotional symptoms in ASDs, previous studies have not yet investigated the role of age in a sample that spans from childhood through adolescence in children with ASD and IQ over 69. The present study examines reported relationships between age, IQ, autism symptoms and parent-rated depression and anxiety symptoms, previously unexamined in the full school-age range of children and adolescents with ASDs (age 6–18) and IQs ≥ 70 . Building on previous research findings, we hypothesized:

1. Levels of depression and anxiety symptoms in our sample will exceed those found in the normative standardization sample.
2. Higher age will relate to increased emotional symptoms.
3. Higher IQ will relate to increased emotional symptoms. As increased age and IQ have been suggested to relate to greater self-awareness of social difficulties and greater depression, we further hypothesized that as age increases, the relationship between higher IQ and increased emotional symptoms will increase.
4. Fewer autism symptoms will relate to increased emotional symptoms. As with IQ, we hypothesized that with higher age, the relationship between fewer autism symptoms and increased emotional symptoms will increase.

2. Methods and measures

2.1. Methods

Participants consisted of 95 children and adolescents with IQ ≥ 70 (age 6–12, $n=54$; age 13–18, $n=41$), who were diagnosed with an autism spectrum disorder based on expert clinical impression using the DSM-IV (APA, 1994). These children were drawn from a pool of individuals who were sequentially referred for clinical services through a multidisciplinary autism clinic in Washington, DC. All participants also met criteria for a 'broad ASD' on the ADI or ADI-R (Le Couteur, Rutter, Lord, & Rios, 1989; Lord, Rutter, & Le Couteur, 1994) and/or the ADOS (Lord, Rutter, DiLavore, & Risi, 2000) according to the criteria established by the NICHD/NIDCD Collaborative Programs for Excellence in Autism (see Lainhart et al., 2006). The group's mean full scale IQ was in the average range ($M=105$, $SD=17$, range = 71–144) as measured by the Wechsler Intelligence Scale for Children-4th Edition (WISC-IV) or the Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler, 1999, 2003). Trained research-reliable staff administered all in vivo measures. Participants with evidence of a neurological or a known genetic disorder were excluded. Participant characteristics (i.e., age, gender ratio, IQ, and autism symptomatology) for the total sample, depression, non-depression, anxiety, and non-anxiety symptom groups (see details on determination of groupings below) are presented in Table 1. Data were obtained as part of an IRB approved protocol.

2.2. Measures

Emotional symptoms measure. Depression and anxiety symptoms were assessed with the Child Behavior Checklist (CBCL) for ages 6–18 (Achenbach & Rescorla, 2001). The CBCL is a standardized parent report questionnaire of child/adolescent behavioral and emotional functioning. Scores are provided for DSM-IV-oriented categories, including affective problems and anxiety problems. Items making up the affective problems domain overlap with DSM-IV diagnostic criteria for depressive disorder. Scores are presented as standardized T scores ($M=50$, $SD=10$), with cutoffs for borderline clinical range ($64 < T < 70$) and clinical range ($T > 69$). Higher scores are indicative of greater problems. For group analyses, individuals without significant depression symptoms were defined as $T < 65$ and individuals with elevated depression symptoms were $T > 64$. The same cutoffs were used to differentiate those without significant anxiety symptoms ($T < 65$) from those with

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