Emotional Intelligence in Children with Autism Spectrum Disorder

by

Sydney E. Kingston

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

In partial fulfilment of the requirements of the degree of

MASTER OF ARTS

Department of Psychology

University of Manitoba

Winnipeg

Abstract

Individuals with Autism Spectrum Disorders (ASD) experience emotion-based difficulties (Bal et al., 2010; Laurent & Rubin, 2004), which can increase their risk for a variety of adverse outcomes, particularly in terms of mental health (Hudepohl, Robins, King, & Henrich, 2015; Mazefsky, 2015). Emotional intelligence (EI) has been used as a lens for investigating various outcomes in typically developing individuals (Poulou, 2014); however, few studies have examined EI in individuals, particularly children, with ASD. As such, the present study attempted to shed light on the EI of this population and its influence on mental health. Six children with ASD and 14 typically developing children (ages 8-12 years) and their parents participated in this study. Children and their parents completed a series of measures to assess EI and various social, behavioural, and emotional outcomes. The findings suggest that at the group level, EI and levels of anxiety and depression do not differ significantly between children with and without ASD. A closer examination of EI scores revealed substantial heterogeneity in EI abilities in children with ASD. Additionally, EI appears to be differentially related to anxiety and depression for children with ASD and their typically developing counterparts. Results of this study may have implications for the development of assessment and intervention procedures and help to further elucidate the developmental trajectory of EI in individuals with ASD; however, due to small sample size, future research should examine this further. Implications, limitations, and directions for future research are discussed.

Keywords: Autism Spectrum Disorders, children, emotional intelligence, heterogeneity, individual differences, mental health

Acknowledgements

I would like to thank the many individuals who made the completion of my Master's thesis possible. First, I would like to thank my advisors, Dr. Janine Montgomery and Dr. Brenda Stoesz for their constant guidance, encouragement, and support throughout this process; particularly in the final few months of writing and oral defence preparation.

I would also like to thank members of the Social Cognition Lab who lent their support in many ways from words of encouragement in the face of participant recruitment difficulties to assisting with collect data.

I would also like to express my gratitude to my family and friends for their unwavering love, encouragement, and understanding. Your support was incredibly helpful and greatly appreciated as I attempted to balance the various requirements of the Clinical Psychology graduate program.

I also want to extend a huge thanks to all the children and their parents/guardians whose participation made this research project possible! Their commitment to this project helped to increase our understanding of emotional intelligence and its impact on the mental health of both children with and without Austim Spectrum Disorder.

Lastly, I would like to express my thanks to the funding agencies that supported this research, including the Psychology Graduate Fellowship, the Mark Lewis Nozick Memorial Scholarship, the University Women's Club of Winnipeg Graduate Scholarship, and the Frederick Banting and Charles Best Canadian Graduate Scholarship – Master's (CGS-M).

Table of Contents

Emotional Intelligence in Children with Autism Spectrum Disorder

Emotions, regarded by the ancient Greeks to be negative influences resulting in irrational, maladaptive impulses, are considered by contemporary theorists to be largely adaptive and crucial to survival (Lazarus, 1991). Further, emotions are inextricably involved in daily life, influencing various facets of human functioning, such as the ways in which we interact with our social world (e.g., Forgas, 2001; Keltner & Kring, 1998; Lopes et al., 2004; Parkinson, Fischer, & Manstead, 2005), school achievement (Malik & Shujja, 2013; Qualter, Gardner, Pope, & Hutchinson, 2012), stress reactions and coping (Petrides, Pérez-González, & Furnham, 2007), health-related behaviours (Brackett, Mayer, & Warner, 2004; Saklofske, Austin, Galloway, & Davidson, 2007), and mental and physical health (e.g., Johnson & Blanchard, 2016; Martins, Ramalho, & Morin, 2010; Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007; Tsaousis & Nikolaou, 2005). Thus, how one engages with one's emotions is crucial to adaptive functioning in the aforementioned areas.

Emotional Intelligence

The ways in which one uses emotion-related information in everyday interactions and to enhance self-understanding has been termed Emotional Intelligence (EI) and has become an increasingly researched construct within emotion-related research in the last two decades (Miners, Côté, & Lievens, 2018). EI has been conceptualized into two distinct models. In the *ability EI* model, EI is described as the ways in which one reasons with emotion-based information through a combination of cognition and affect. Ability EI measures emotional knowledge, similar to crystalized intelligence; and is related to fluid intelligence which is characterized by reasoning ability to a lesser extent (Roberts, Schulze, O'Brien, MacCann, Reid, & Maul, 2006). Ability EI is conceptualized as being composed of four branches: Perceiving

Emotions, Using Emotions to Facilitate Thought, Understanding Emotions, and Managing Emotions (Mayer, Salovey, Caruso, & Sitarenios, 2001). Branch scores are grouped into two area scores. The first area, Experiential EI, involves identifying emotions, how emotions relate to other sensations, and comprehending how emotions influence and are influenced by thought. The second area, Strategic EI, involves comprehending the meanings inherent in emotions, how emotions may impact relationships and interactions, and how to effectively regulate emotions (Mayer et al., 2001). As Mayer et al. view EI as an ability similar to general intelligence, EI is assessed with objective performance measures. The branches exist in a hierarchical relationship in that the first branch (i.e., Perceiving Emotions) is a necessary precursor to the second branch (i.e., Using Emotions), and so on (see Table 1).

Table 1

The Four-Branch Model of Emotional Intelligence[a]

Area	Branch	Skills Involved
1. Experiential EI	1. Perceiving Emotions	The ability to perceive emotions in oneself and others, and in other mediums (e.g., music, art).
	2. Using Emotions to Facilitate Thought	The ability to use emotion-based information in the service of cognitive processes; often in a goal-directed manner.
2. Strategic EI	3. Understanding Emotion	The ability to label emotions and understand emotion-based information, including: how different emotions are related, the composition of complex emotions, and the precursors and consequences of emotions.
	4. Managing Emotions	The ability to modulate the experience and expression of an

	emotion in oneself or others, often for goal-directed purposes.

Note. EI = Emotional Intelligence.
[a]The four-branch model of EI as measured by the MSCEIT: YV (Mayer et al., 2014).

Mayer et al. (2001) and Mayer, Salovey, and Caruso (2014) reason that each branch is necessary for overall emotional functioning and each contributes uniquely to one's overall EI. First, the perception of emotions involves the ability to accurately identify and express one's own emotions and recognize the emotions of others through facial expressions, tone of voice, body language, and the situational context. Second, Using Emotions to Facilitate Thought involves the ability to use emotions to facilitate certain styles of thinking and action, typically in a goal-directed manner. This requires the knowledge that emotions and thoughts have a bidirectional influence on one another. Next, Understanding Emotions involves the labelling of emotions, the comprehension of how certain emotions may be related, the identification of the multiple feelings that compose a more complex emotional state, and the recognition of the antecedents and consequences of particular emotions in varying contexts. The fourth branch, Managing Emotions, involves the ability to control one's experience and expression of an emotional state, often in the service of goal-directed behaviour (e.g., channelling anxiety into constructive behaviour). Emotion management also involves the ability to use information about emotions and interactions to regulate the emotions of others (see Table 1).

In the *trait EI* model, EI is conceptualized as one's self-perceived emotion-related abilities and includes various personality factors (e.g., optimism; Petrides et al., 2007). According to Bar-On and Parker (2000), trait EI consists of five dimensions, including Intrapersonal skills, Interpersonal skills, Adaptability, Stress Management, and General Mood. The Intrapersonal domain involves recognizing, understanding, and expressing one's own

feelings in a self-directed, adaptive manner. Comparably, the Interpersonal domain involves recognizing and understanding the feelings of others, interacting cooperatively with others, and the formation and maintenance of mutually satisfying interpersonal relationships. The third domain, Adaptability, involves recognizing problems and devising a constructive solution to those problems. The Adaptability domain also includes modifying feelings, thoughts, and behaviours to match one's social context. Next, Stress Management involves responding to unfavourable events with resilience and coping in an effective manner, and the ability to inhibit impulses. Lastly, General Mood involves one's contentment and optimism regarding one's life (see Table 2).

Table 2

The Domains of Trait Emotional Intelligence as Measured by the BarOn Emotional Quotient Inventory: Youth Version (Short Form; BarOn EQ-i: YV(S); Bar-On & Parker, 2000)

Scale	Description
Intrapersonal	
1. Emotional self-awareness	Identifying and understanding one's own feelings
2. Assertiveness	Expressing emotions, beliefs, and thoughts, and asserting oneself in an effective manner
3. Self-regard	Understanding, respecting, and accepting oneself
4. Self-actualization	Realizing one's potential
5. Independence	Being self-directed and self-controlled, and not emotionally dependent
Interpersonal	
1. Empathy	Identifying and appreciating the experiences of others
2. Interpersonal relationships	Forming and maintaining mutually satisfying, emotionally close interpersonal relationships
3. Social responsibility	Behaving in a responsible and cooperative manner

Adaptability	
1. Problem solving	Awareness of problems and devising effective solutions
2. Reality testing	Realistically assess the degree of consistency between subjective and objective reality
3. Flexibility	Modifying thoughts, emotions, and behaviours with changes in the environment
Stress Management	
1. Stress tolerance	Resiliency through adverse experiences through effective coping
2. Impulse Control	Postponing or delaying acting on an impulse

Note. Adapted from "What We Know About Emotional Intelligence: How it Affects Learning, Work, Relationships, and Our Mental Health," by M. Zeidner, G. Matthews, and R. D. Roberts, 2012, p. 114. BarOn EQ-i: YV(S) = BarOn Emotional Quotient Inventory: Youth Version (Short Form; Bar-On & Parker, 2000).

As trait EI involves one's own behavioural dispositions and self-assessments, it is measured through self-reports (as opposed to performance-based measures) in which respondents evaluate their own emotion-related abilities such as how well they can identify and manage their own emotions and those of others. While information regarding perceptions of one's own abilities is valuable considering the influence it may have on their interactions with the world around them, there are several drawbacks to relying on self-report to assess psychological constructs, particularly one that is described as an 'intelligence.' The term intelligence implies a performance aspect requiring objective assessment, however, self-report is inherently subjective and can only provide a window on one's internal appraisal of one's own performance, which may not provide an accurate depiction of actual abilities. Inaccurate responses may arise for multiple reasons such as test-takers perceiving their abilities as better or worse than they actually are, or conscious or unconscious biases that influence test-takers' responding (Zeidner, Matthews, & Roberts, 2012). To manage these issues, some test-developers have included

validity scales designed to detect biased responding (e.g., Positive Impression Index; Bar-On & Parker, 2001), whereas others have suggested comparing self-reports to parent or peer reports (Zeidner et al., 2012).

Although distinct from personality characteristics, trait EI is often considered within a personality framework (Petrides & Furnham, 2001; Petrides et al., 2016; Petrides et al., 2007). Petrides et al. (2016) suggested that trait EI be integrated into personality hierarchies and situated at a level between specific personality traits and broad, higher-order personality dimensions (Petrides et al., 2007). In contrast, others argue that trait EI is nothing more than personality; as such, is a redundant construct (e.g., Zeidner et al., 2012). For example, scores generated from measures of trait EI are highly correlated with scores generated from measures of higher order personality traits such as those composing the Big Five (i.e., Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism; Conte, 2005; Davies, Stankov, & Roberts; 1998; De Raad, 2005; McCrae, 2000; van der Linden et al., 2017), and provides minimal information once personality is controlled for in analyses (Zeidner et al., 2012). Proponents of this view argue that if trait EI is a distinct construct, then it should offer unique information (incremental validity over personality) in predicting important outcomes and have discriminant validity over and above personality. In response, other research has demonstrated that trait EI provides unique information in predicting important outcomes (incremental validity; e.g., Joseph & Newman, 2010; Saklofske, Austin, & Minski, 2003), and thus, many argue that trait EI is not just personality reinvented, but has clinical utility in terms of targeting these outcomes via trait EI.

Although trait and ability models predominate the EI literature, other models of EI have emerged. Mixed models, such as Goleman's emotional competencies (Boyatzis, Goleman, & Rhee, 2000), consist of competencies and skills; incorporating non-cognitive factors including

social skills, self-esteem, and motivation (Hodzic, Scharfen, Ripoll, Holling, & Zenasni, 2017). Another approach to EI is offered by integrative models, such as the Cascading Model, which attempt to incorporate the extant theories of EI into one model (Joseph & Newman, 2010). Similar to trait EI, these mixed models face criticism in that they tend to be too broad in their definition of EI and lack empirical basis (Joseph & Newman, 2010; Murphy, 2006). Furthermore, relative to trait and ability models, a paucity of research has been conducted on these models, partially due to EI itself being a relatively new construct (Joseph & Newman, 2010).

Despite debate regarding the respective strengths and limitations of trait and ability EI, both forms have an important influence on a variety of outcomes. For example, individuals with high levels of trait EI are less likely to engage in bullying behaviour (Baroncelli & Ciucci, 2014; Lomas, Stough, Hansen, & Downey, 2012), are more likely to engage in prosocial behaviour (Frederickson, Petrides, & Simmonds, 2012; Mavroveli, Petrides, Rieffe, & Bakker, 2007; Mavroveli, Petrides, & Sangareau, 2009), adaptive coping skills (Mikolajczak, Petrides, & Hurry, 2009), and health-promoting behaviours (e.g., healthy diet; Saklofske et al., 2007), and are more satisfied with their lives overall (Extremera, Duran, & Rey, 2007). Furthermore, trait EI is negatively associated with the risk of developing anxiety and depression (Extremera et al., 2007; Martins et al., 2010; Mavroveli et al., 2007). Moreover, the construct of EI has been used as a means of examining emotional difficulties and how they relate to various maladaptive outcomes in typically developing individuals (e.g., Poulou, 2014). For example, low levels of ability EI are associated with loneliness (Wols, Scholte, & Qualter, 2015), and predict depression and disruptive behaviour (Davis & Humphrey, 2012). Evidently, the ways in which one engages with emotions is crucial to adaptive functioning and is critical to reducing the likelihood of

mental health problems. In fact, enhancing elements of EI such as emotion awareness and emotion management (Nelis, Quoidbach, Mikolajczak, & Hansenne, 2009) are integral components of various psychotherapies (Nelis et al., 2011; Nyklicek, Schalken, & Meertens, 2015) and contribute to symptom reduction and maintenance of therapeutic gains (Nyklicek et al., 2015). Thus, improving EI is important for the prevention and intervention of mental health conditions.

Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is the most common neurodevelopmental disorder in children (American Psychiatric Association; [APA], 2013); affecting approximately one in 66 children aged 5-18 years in Canada (Public Health Agency of Canada, 2018). According to the *Diagnostic and Statistical Manual of Mental Disorders* - 5th ed (*DSM-5*; APA, 2013), symptoms may include: deficits in social communication, interaction, and non-verbal communication skills (e.g., abnormal eye contact); impaired ability to initiate, develop, maintain, and understand interpersonal relationships; restricted, repetitive behaviours, interests, and activities; an insistence on sameness and inflexibility in routines; and hyper- or hyposensitivity to sensory stimuli and/or an abnormal preoccupation with particular stimuli. This condition is heterogeneous (hence the term 'spectrum') in that each individual displays a unique symptomatology, varying in presentation, type, and severity (APA, 2013; Seltzer et al., 2003). Individuals have historically been demarcated as 'low-functioning' or 'high-functioning' depending on whether their IQ is below or above 80, respectively (Mayes et al., 2009). ASD is more common in males, affecting approximately four times as many males as females, however, the symptom presentation of females with ASD is often qualitatively different than their male counterparts. For example, accompanying intellectual impairment is more common in females

(Mandy, Chilvers, Chowdhury, Salter, Seigal, & Skuse, 2012), whereas restrictive/repetitive behaviours tend to be less severe (Mandy et al., 2012; Rivet & Matson, 2011). Moreover, females without intellectual impairment are less likely to experience severe social impairment (Rivet & Matson, 2011). Thus, in the absence of intellectual impairment and mild social and communication difficulties, many females may not be identified with ASD (Rivet & Matson, 2011).

ASD and Emotional Intelligence

It has long been recognized that individuals with ASD struggle to deal with their own emotions and those of others. Individuals with ASD tend to experience impaired emotion processing (e.g., identifying and describing emotion; Hill, Berthoz, & Frith, 2004) and recognition (Bal et al., 2010), poor emotion regulation (Samson, Hardan, Podell, Phillips, & Gross, 2015), and are likely to experience high levels of negative emotions (Laurent & Rubin, 2004). Emotional difficulties influence social outcomes and may increase risk for mental health problems in individuals with ASD. For example, Mazefsky, Borue, Day, and Minshew (2014) found that for individuals with ASD, maladaptive emotion management strategies were associated with the development of anxiety and depression, both of which are highly prevalent in ASD (Bellini, 2004; Simonoff et al., 2008; Vickerstaff, Heriot, Wong, Lopes, & Dossetor, 2007). Individuals with ASD may eventually learn compensation strategies (APA, 2013; Petrides et al., 2017) that mask their difficulties (e.g., in social-emotional interaction); however, the stress caused by engaging in these strategies in an attempt to present themselves in a 'socially-acceptable' manner may contribute to the development of anxiety and depression (APA, 2013; Holliday-Willey, 2015). Thus, as navigating social situations may not be intuitive but rather a highly conscious process for these individuals, additional effort and strain may contribute to

avoiding social interaction (APA, 2013; White, Oswald, Ollendick, & Scahill, 2009). Consequently, anxiety and depression contribute to social-emotional impairment and avoidance of social situations in ASD; in turn, social-emotional impairment and avoidance contribute to anxiety and depression (White et al., 2009; Whitehouse, Durkin, Jaquet, & Ziatas, 2009). Social isolation is troubling because many individuals with ASD desire social interaction, peer acceptance, and friendship (Williamson, Craig, & Slinger, 2008), and may have adverse implications for the development of social-emotional skills. Accordingly, the social-emotional skills gap between individuals with ASD and their typically developing counterparts may widen further. Likewise, EI may be negatively impacted through the avoidance of social interactions, and, in turn, increase the risk for anxiety and depression.

Relatively few EI studies have been conducted with the ASD population; however, the results of these studies suggest impairments in this group (e.g., Boily, Kingston, & Montgomery, 2017; Montgomery et al., 2008). In one study, adolescents with ASD (aged 13-17 years) had significantly weaker overall scores on both trait and ability EI measures compared to typically developing peers (Boily et al., 2017). More specifically, individuals with ASD scored significantly lower on interpersonal and stress management skills in trait EI, and on ability EI subscales assessing the ability to understand and manage emotions (Boily et al., 2017). In contrast, a different pattern of findings was demonstrated in older adolescents and young adults. Young adults with Asperger syndrome[1] demonstrated deficits in trait EI, but had adequate ability EI (Brady et al., 2014; Montgomery et al., 2008; Montgomery, McCrimmon, Schwean, &

[1] Prior to the DSM-5, Asperger Syndrome, considered a higher-functioning form of ASD, was differentiated from autism by the absence of delays in language and cognitive development. In the DSM-5, Asperger Syndrome has been subsumed under the umbrella of Autism Spectrum Disorders (APA, 2013; Ehlers, Gillberg, & Wing, 1999).

Saklofske, 2010; Montgomery, Stoesz, & McCrimmon, 2013). Additionally, EI predicted social outcomes for these young adults (Montgomery et al., 2008; 2010; 2013). The authors of these studies suggested that while young adults with ASD reported poor skills in social-emotional contexts, their ability to process and reason with emotion-based information was intact.

One study found no significant differences in trait EI (using the youth version of the BarOn EQ-i) between 8- to 12-year-olds with and without ASD (McCrimmon, Matchullis, & Altomare, 2016), suggesting that difficulties may not be present or are less evident during this period of development, or that measures are not sensitive enough to determine differences. For those with ASD, impairments in trait EI may not become observable until social demands increase as they typically do during adolescence (Picci & Scherf, 2015). Furthermore, with the onset of puberty, adolescents with ASD may experience deterioration in functioning (Picci & Scherf, 2015) associated with increases in social withdrawal (Anderson, Maye, & Lord, 2011) and loneliness (Deckers, Muris, & Roelofs, 2007). For these reasons, impairments in trait EI may not be evident in young children with ASD. Moreover, participants in the McCrimmon et al. study demonstrated average to above average verbal intelligence. Because verbal intelligence predicts trait EI (Hogan et al., 2010), and is positively associated with accuracy in identifying and matching emotional expressions in 4- to 7-year-olds with ASD (Williams & Gray, 2013), the verbal skills of these participants may have enhanced their trait EI.

Given that individuals with ASD often experience comorbid Attention Deficit/Hyperactivity Disorder (ADHD; Holtmann, Bolte, & Poustka, 2007; Sinzig, Walter, & Doepfner, 2009), research regarding EI in ADHD may inform the present study. In a study examining trait and ability EI in 9- to 11-year-olds, children with ADHD demonstrated comparable overall trait EI but had significantly lower Interpersonal and Adaptability subscale

scores than the normative sample (Climie, 2012). While similar performance was evident on overall ability EI, children with ADHD demonstrated impaired performance on Understanding Emotions, but significantly better performance on Managing Emotions (Climie, 2012).

The Present Study

Given the profound impact that emotions have on many life areas, and the difficulties that individuals with ASD tend to experience with social-emotional information/situations (APA, 2013), the construct of EI may offer the potential to identify strengths and/or deficits in this population. Moreover, as trait (Qualter, Whiteley, Hutchinson, & Pope, 2007; Viguer, Cantero, & Bañuls, 2017) and ability (Castillo, Salguero, Fernandez-Berrocal, & Balluerka, 2013; Nelis et al., 2009) EI improve with training in typically developing youth, deficits could be remediated and its development supported. Identification of when deficits emerge is important especially considering that childhood offers an optimal window to intervene (January, Casey, & Paulson, 2011); however, there is a paucity of research examining EI in *children* with ASD. As such, the present study sought to shed light on this area by exploring whether trait and ability EI differed between children with and without ASD. Further, as EI has been shown to influence mental health for typically developing individuals (Davis & Humphrey, 2012) and emotional difficulties can increase the risk for mental health problems in ASD (e.g., Mazefsky, 2015; Mazefsky et al., 2014), anxiety and depression were compared across groups and the relationship between EI and mental health (i.e., anxiety and depression) was examined.

The limited research on trait EI in adolescents and young adults with ASD has documented impairment in trait EI and its various domains (Boily et al., 2017; Montgomery et al., 2010). The only study examining trait EI in children (aged 8-12 years) with ASD found no impairment in trait EI; however, average to high average verbal intelligence may have enhanced

EI and minimized difficulties (McCrimmon et al., 2016). Thus, the present study aimed to elucidate trait EI in children with ASD. Differences on at least some of the trait EI domains (i.e., Interpersonal, Stress Management, and Adaptability subscales) between children with and without ASD were expected. As trait EI and ability EI are regarded as distinct constructs and offer unique yet complementary information (Montgomery et al., 2010; 2013), the ability EI of children with and without ASD was also of interest. The absence of specific research on ability EI in children with and without ASD makes it difficult to predict whether strengths or weaknesses would emerge in the clinical group; as such, the possibility of group differences in either direction were examined. Considering that individuals with ASD experience more mental health issues compared to typically developing individuals (e.g., Bellini, 2004; Gadow, DeVincent, Pomeroy, &, Azizan, 2005), in the present study, children with ASD were expected to score higher on self- and parent-reports of anxiety and depression than typically developing children. Better developed EI was expected to be associated with lower levels of anxiety and depression in children with ASD, as they are in typically developing individuals (e.g., Davis & Humphrey, 2012; Extremera et al., 2007; Martins et al., 2010; Mavroveli et al., 2007).

Method

Participants

Eight children with 'high-functioning' ASD and 14 typically developing children between the ages of 8 and 12 years were recruited to participate in this study through posters displayed in a variety of health, education, and service centres in Winnipeg (e.g., University of Manitoba, Asperger Manitoba, St. Amant, YMCA); social media websites relevant to the ASD community (e.g., Parents of Autistic Children Everywhere); the Social Cognition Lab's participant recruitment database; and word of mouth. Six children with ASD (M = 9.64 years, SD

= 1.55 years, *Range* = 8-12 years; 5 males, 1 female) and 14 typically developing children (*M* = 10.33 years, *SD* = 1.63 years, *Range* = 8-12 years; 5 males, 9 females) met the inclusion criteria.

Inclusion criteria. Children with ASD were required to have a diagnosis of ASD made by a medical doctor, psychologist, or psychiatrist prior to participation. To validate the diagnosis of ASD and the absence of ASD for the clinical and control groups, respectively, parents/legal guardians completed the Social Communication Questionnaire – Lifetime form (SCQ; Wiggins, Bakeman, Adamson, & Robins, 2007). Because the children with ASD in this study were considered 'higher-functioning', scores of ≥ 10 were used confirm the diagnoses of ASD and to reduce the possibility of false negatives (Goin-Kochel & Cohen, 2008; Schanding, Nowell, & Goin-Kochel, 2012). Children also had to obtain a verbal intelligence quotient (VIQ) of ≥ 80 (± 5) on the Wechsler Abbreviated Scale of Intelligence – Second Edition (WASI-II; Wechsler, 2011) as many of the study measures required adequate reading and speaking abilities. As participation required the ability to speak, individuals with selective mutism were excluded from participating. Furthermore, participants who had experienced a significant brain injury requiring hospitalization were excluded as these injuries could have produced effects that may have confounded the results. The data from two participants with ASD were deleted from the dataset as one rescinded assent and one obtained a VIQ below the cut-score. The characteristics of the study groups are presented in Table 3.

Table 3

Characteristics of the Study Groups, Mean (SD)

Group	Age (years)	Verbal Intelligent Quotient (VIQ)	Social Communication Questionnaire (SCQ)
Autism Spectrum Disorder (*n* = 6)	10.33 (1.63)	115.50 (25.78)	18.67 (5.89)

Typical (n = 14)	9.64 (1.55)	115.93 (17.97)	2.15 (2.12)

Procedures

Participants completed the study in the Social Cognition Lab at the University of Manitoba or at a quiet location of their choosing (e.g., their home). Informed consent was obtained from the children's parent/legal guardians and children provided verbal assent after listening to a developmentally appropriate description of the study. Next, children completed the WASI-II (Wechsler, 2011) followed by a battery of measures in randomized order, including the BarOn Emotional Quotient Inventory: Youth Version, Short Form (BarOn EQ-i: YV(S); Bar-On & Parker, 2000), the Mayer-Salovey-Caruso Emotional Intelligence Test-Youth Version (MSCEIT-YV; Mayer, Salovey, & Caruso, 2014), and the Behaviour Assessment System for Children, Second Edition: Self-Report of Personality (BASC-2: SRP; Reynolds & Kamphaus, 2004) in individual testing sessions. The measures required approximately 90 min to complete. Breaks and snacks were provided as needed. Participants received a modest honorarium (e.g., small toys, stickers) to acknowledge their contribution to research. In a separate room, the parent/legal guardian completed four measures: the SCQ; the Behaviour Assessment System for Children, Second Edition: Parent Rating Scale (BASC-2: PRS; Reynolds & Kamphaus, 2004); the Inventory of Children's Individual Differences – Short Form (ICID-S; Deal, Halverson, Martin, Victor, & Baker, 2007), and a general information questionnaire (see Appendix A). This study was approved by the University of Manitoba Psychology/Sociology Research Ethics Board.

Measures

Social Communication Questionnaire-Lifetime Form (SCQ). The SCQ is a parent-report measure consisting of 40 yes or no items designed to measure the communication abilities

and social functioning of children ages 4 years and older (Wiggins et al., 2007). Raw scores on the 40 items are summed yielding a total score that is interpreted with reference to cut-off scores. The SCQ is sensitive (0.88) and specific (0.72) in distinguishing between individuals with and without ASD (Chandler et al., 2007). The SCQ requires approximately 10 min to complete.

Wechsler Abbreviated Scale of Intelligence – Second Edition (WASI-II). The WASI-II is designed to assess the intellectual abilities of individuals ranging in age from 6 to 89 years, and contains four subtests: Vocabulary, Similarities, Matrix Reasoning, and Block Design (Wechsler, 2011). For the purpose of this study, only two subtests (i.e., Vocabulary and Similarities) were administered to ensure that participants met the inclusion criterion of a VIQ of $\geq$ 80 ($\pm$ 5), and required approximately 20 min to complete. Vocabulary assesses "word knowledge and verbal concept formation" and Similarities measures "verbal concept formation and reasoning" (Wechsler, 2011). Raw subtest scores were converted to *T* scores (Wechsler, 2011). Scores contribute to a single estimate of VIQ. Research suggests that scores generated by the WASI-II have acceptable psychometric properties (Irby & Floyd, 2013).

BarOn Emotional Quotient Inventory: Youth Version, Short form (BarOn EQ-i: YV (S)). The BarOn EQ-i: YV (S) is a self-report measure designed to assess the trait EI of youth ranging in age from 7 to 18 years. The short form is composed of 30 items in which respondents rate the extent to which a statement is true of them using a 4-point Likert-type scale. The 30 items form four subscales including the Intrapersonal Scale, Interpersonal Scale, Stress Management Scale, and Adaptability Scale (see Table 2). The BarOn EQ-i:YV(S) also provides a total Emotional Quotient (EQ) score and a validity scale to measure the tendency to portray oneself in a overly positive manner (Positive Impression scale). Each scale provides a raw score, obtained by summing item responses, which is converted to a standard score (M = 100, SD = 15).

Scores on this measure are scaled according to age. The BarOn EQ-i: YV (S) takes approximately 10-15 min to complete and scores obtained from this measure have been demonstrated to have acceptable psychometric properties (Bar-On & Parker, 2000).

Mayer-Salovey-Caruso Emotional Intelligence Test-Youth Version (MSCEIT-YV). The MSCEIT-YV is a performance-based measure designed to assess the ability EI of youth aged 10-18 years (Mayer et al., 2014). This measure is based on Mayer and Salovey's (1997) four-branch model of EI (see Table 1), and, as such, assesses the ability to perceive emotions, understand emotions, use emotions to facilitate thought, and manage emotions. The MSCEIT-YV has a hierarchical organization in that it provides an overall EI score (Total EIQ), which is subdivided into two area scores: Experiential EIQ and Strategic EIQ. The area scores are composed of branch scores. Specifically, Experiential EIQ consists of Perceiving Emotions and Facilitating Thought and Strategic EIQ consists of Understanding Emotions and Managing Emotions. As such, the MSCEIT-YV yields six scores, each becoming progressively narrower in scope. The MSCEIT-YV provides a validity index, the Positive-Negative Bias scale, designed to indicate whether a test-taker tended to perceive emotions included in the Perceiving Emotions subscale as more positive or more negative. All composite and subscale scores are based on a mean of 100 and a standard deviation of 15 and are age-scaled. The MSCEIT-YV requires 20-30 min to complete and there is evidence that scores generated by this measure have acceptable reliability and validity (Mayer et al., 2014).

Normative scores are not available for children under the age of 10 years. It is under the researcher's discretion to use this measure with children below the intended age range and to compare scores to youngest normative group (i.e., 10-year-olds), although it is not recommended (Multi-Health Systems, personal communication, February 23, 2017). As such, the raw scores

for this measure were examined across all ages in the present sample.

General Information Questionnaire. The general information questionnaire is a regularly used lab-created questionnaire, completed by parents/legal guardians, intended to collect information about the participant such as age, gender, official diagnosis, and language development (see Appendix A).

Behaviour Assessment System for Children, Second Edition (BASC-2). The BASC-2 is designed to measure the social, emotional, and behavioural outcomes of individuals ranging in age from 2 to 25 years (Reynolds & Kamphaus, 2004). Three rating forms are available including the Self-Report of Personality, the Parent Rating Scale, and the Teacher Rating Scale. For the purpose of this study, only the self-report and parent-report forms were used, specifically, the BASC-2 Parent Rating Scale (PRS)-Child (6-11 years), the BASC-2 Parent Rating Scale (PRS)-Adolescent (12-21 years), the BASC-2 Self-Report of Personality (SRP)-Child (8-11 years), and the BASC-2 Self-Report of Personality (SRP)-Adolescent (12-21 years). The BASC-2 provides age-scaled *T* scores with a mean of 50 and a standard deviation of 10. The self-report form requires approximately 30 min to complete, whereas the parent-report takes approximately 15 min to complete. Evidence suggests that scores obtained from this measure are reliable and valid (Reynolds & Kamphaus, 2004).

Inventory of Children's Individual Differences - Short Form (ICID-S). The ICID-S is a 50-item parent-report measure intended to assess the personality structure of children ages 2-15 years (Deal et al., 2007). Parents are asked to rate the extent to which each item describes their child using a 7-point Likert type scale. Each item corresponds to a lower order facet with the lower order facets corresponding to particular higher order facets. As such, scores on individual items are summed to provide raw scores on 15 lower order scales that are summed to provide

raw scores on five higher order facets which map onto the Big Five personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism). For example, Conscientiousness (a higher order facet) is composed of Organized, Achievement Orientation, and Distractible (lower order facets). Evidence for the reliability and validity of scores obtained using the ICID-S has been shown to be adequate (Deal et al., 2007).

Data Analysis

The data was collected by the researcher and trained research assistants and was entered and verified by the researcher. The distributions of the scores were examined visually to identify outliers; 1–3 outliers were identified in 12 of the study variables. For seven of the variables, scores in both groups showed a distribution pattern that deviated from normality according to Shapiro-Wilk tests, and values of skewness and kurtosis deviated from zero. Because the sample sizes were small and unequal, and due to the presence of non-normality and outliers, nonparametric procedures (Mann-Whitney U, Wilcoxon Signed-Rank, Spearman Rho), which are distribution-free and robust to the presence of outliers, were used to analyze the data (Field, 2013; Howell, 2013). Due to the exploratory nature of the study, Type I error correction procedures were not applied (Bender & Lange, 2001).

Results

Emotional Intelligence

The data was analyzed in several stages. In step one, the values on the validity scales for the BarOn EQ-i: YV(S) and the MSCEIT-YV were examined using one-sample Wilcoxon Signed-Rank tests comparing the median for each group to the median of the normative sample. The BarOn EQ-i: YV(S) Positive Impression Index scores for the typical group (*Mdn* = 94.00) and the ASD group (*Mdn* = 98.00) were similar to the normative groups' scores (Z = -1.48, p =

.14 and $Z = -1.38$, $p = .17$, respectively). Similarly, the MSCEIT-YV Positive-Negative Bias scale for typical (*Mdn* = 103.64) and ASD (*Mdn* = 104.98) groups were similar to the normative group's scores ($Z = 1.92$, $p = .06$ and $Z = 0.73$, $p = .46$, respectively).

In step two, the data from the typical group in the present study was compared to the normative data published in the manuals to ensure that they were a representative sample. The results of the statistical tests comparing the groups on overall trait and ability EI scores were inconclusive ($Z < 1.98$, $p \geq .05$, for both contrasts).

In step three, the median scores for the BarOn EQ-i: YV(S) and MSCEIT-YV overall and subscales scores for the two study groups were compared. As seen in Table 4, group differences did not emerge; thus, it appears that at the ages of 8-12 years, the ASD group did not show deficits in trait nor ability EI.

Table 4

Group Comparisons in Total and Subscale Scores on the Measures of Trait and Ability Emotional Intelligence (EI)

Emotional Intelligence Scales	**ASD Group *Mdn***	**Typical Group *Mdn***	***U***	**MRD**	***p***	**Effect Size (*r*)**
Trait EI: BarOn Emotional Quotient Inventory: Youth Version, Short Form						
Total Emotional Quotient	105.0	100.0	45.0	-0.71	.84	.06
Intrapersonal Skills	107.0	95.0	57.0	-3.57	.24	.28
Interpersonal Skills	97.5	96.0	49.0	-1.67	.60	.13
Stress Management	103.5	112.0	34.5	1.79	.55	-.14
Adaptability	86.5	89.5	38.5	0.83	.78	-.06
Ability EI: Mayer-Salovey-Caruso Emotional Intelligence Test – Youth Version						
Total Emotional Intelligence Quotient	100.9	92.3	43.0	-2.62	.40	.20

Experiential EI	96.2	99.3	39.0	0.71	.84	-.06
Perceiving Emotions	108.2	115.7	25.0	4.04	.18	-.31
Facilitating Thought	91.6	92.9	41.0	0.24	.97	-.02
Strategic EI	100.5	89.6	54.5	-2.97	.31	.23
Understanding Emotions	101.2	95.3	54.0	-2.86	.35	-.22
Managing Emotions	105.5	94.5	56.0	-3.33	.27	.26

Note. MRD = Mean Rank Difference, subtracts the mean rank of group 1 from the mean rank of group 2; ASD = autism spectrum disorder; Total EQ = Total Emotional Quotient.

Group differences, however, may be masked by large individual variation in the scores produced by the children with ASD. As such, individual scores generated from the responses by individual children with ASD were examined in detail. In step four, the EI total scores and subscale scores from each participant with ASD were plotted against the 95% bootstrapped confidence interval (CI) around the median for the typical group. This approach provides a useful supplement to group-level comparisons considering the heterogeneous nature of the autism spectrum (APA, 2013; Szatmari 1999) and may help to identify strengths and weaknesses of individuals with ASD.

Trait EI. There was variation in the BarOn EQ-i: YV(S) subscale scores; both within and between participants with ASD (see Figure 1). In general, Participants 1, 2[2], 3, and 5 performed well on all areas of trait EI. Participant 2 scored below the lower limit of the typical group's 95% bootstrapped CI on the Stress Management subscale suggesting a struggle to manage stress. Participant 5's Interpersonal subscale score fell below the typical group's 95% bootstrapped CI,

[2] For the BarOn EQ-i: YV(S) Positive Impression Index, Participant 2 scored more than one standard deviation below the mean of the normative group and below the lower limit of the typical group's 95% bootstrapped CI, indicating a tendency to respond negatively. However, this tendency was not large and was unlikely to have a major influence on the interpretation of Participant 2's trait EI scores.

suggesting that this individual had weak interpersonal skills. Participant 4 (the only female in the sample) demonstrated weaknesses on several areas of trait EI, specifically, on the Total EQ and the Interpersonal, Stress Management, and Adaptability subscales. Participant 6 displayed superior performance on most scales excluding the Stress Management subscale, in which his performance was well below the 95% bootstrapped CI.

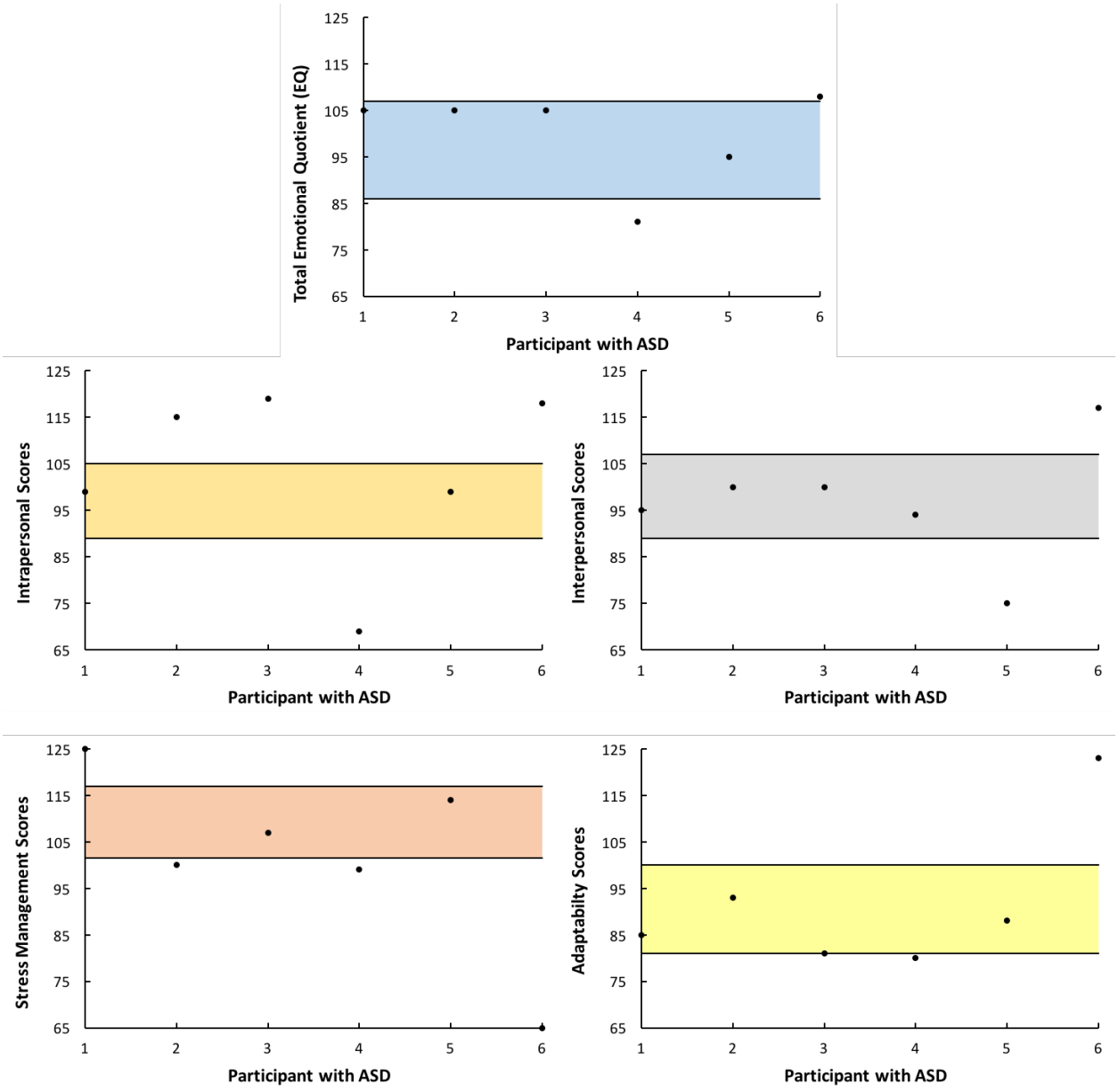

Figure 1. Comparison of children with Autism Spectrum Disorder (ASD) to the typical group's 95% bootstrapped confidence interval (CI) around the median on the BarOn Emotional Quotient Inventory: Youth Version, Short Form (BarOn EQ-i: YV(S), a measure of trait emotional intelligence. In each panel,

the shaded region represents the typical group's 95% bootstrapped CI. Dots indicate the performance of the children with ASD.

Ability EI. Similar to trait EI, there was variation in MSCEIT-YV scores within and between each participant with ASD (see Figures 2 and 3). When examining overall ability EI, most participants scored within or above the 95% bootstrapped CI of the typical group's median with Participants 1 and 2 scoring above the upper limit. The exception was Participant 5 who scored well below the 95% bootstrapped CI (and almost 2 SDs below the median of the normative sample). This is likely due to Participant 5 struggling on all facets of ability EI.

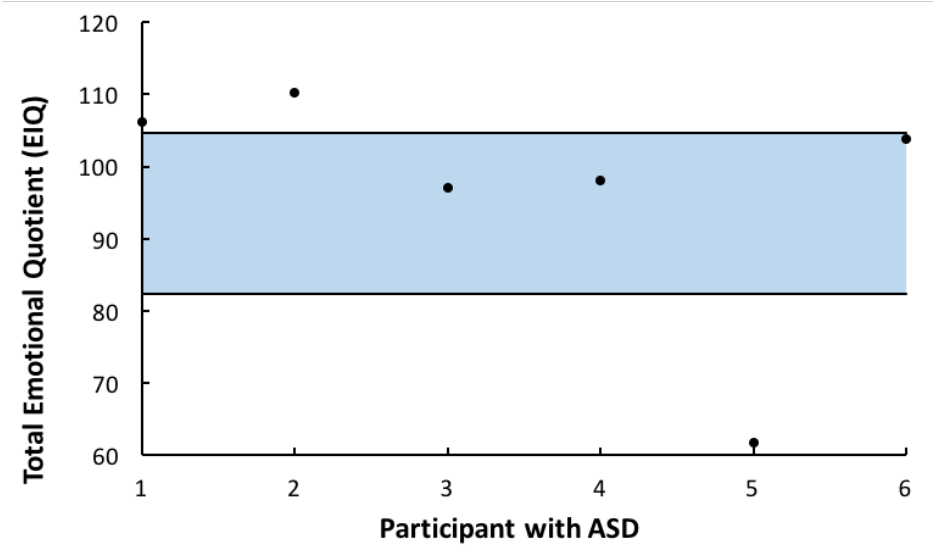

Figure 2. Comparison of children with Autism Spectrum Disorder (ASD) to the typical group's 95% bootstrapped confidence interval (CI) around the median of the Mayer-Salovey-Caruso Emotional Intelligence Test – Youth Version (MSCEIT-YV), a measure of ability emotional intelligence, Total Emotional Quotient (EQ). The shaded region represents the typically developing group's 95% bootstrapped CI. Dots indicate the performance of the children with ASD.

Area and branch scores also varied across participants with ASD. Consistently, Participants 1, 2, and 3 performed well on both area scores (top two panels of Figures 3) and all branch scores (bottom 4 panels of Figure 3) as they scored within or above the typical group's 95% bootstrapped CI. Participant 4 showed a strength in the Strategic EI area but struggled with Experiential EI, which was likely due to struggling with the Facilitating Thought branch. Given

that Mayer et al. (2014) consider the ability to use emotions to facilitate thought as a precursor to Understanding Emotions and Managing Emotions (which compose Strategic EI), it is surprising that Participant 4 demonstrated superior performance on these relatively more advanced abilities. Participant 5 demonstrated consistently impaired performance, indicating that he generally struggles to reason with emotion-based information. As the ability to perceive, use, understand, and manage emotions are required for successful interactions with others, deficits in these abilities may have contributed to this participant's lower score on the Interpersonal Skills subscale of trait EI. Participant 6's performance displayed the most variability -- he demonstrated superior performance on the Experiential EI branch because he demonstrated intact to superior performance on advanced domains (Facilitating Thought, Strategic EI, Understanding Emotions, Managing Emotions), but struggled to accurately perceive emotions, the most rudimentary branch of Mayer et al.'s (2014) model. This pattern of strengths and weaknesses is interesting as the ability to accurately perceive emotion is hypothesized to be necessary for higher level abilities (Mayer et al., 2014). Overall, the examination of individual scores support the heterogeneous nature of the autism spectrum (APA, 2013).

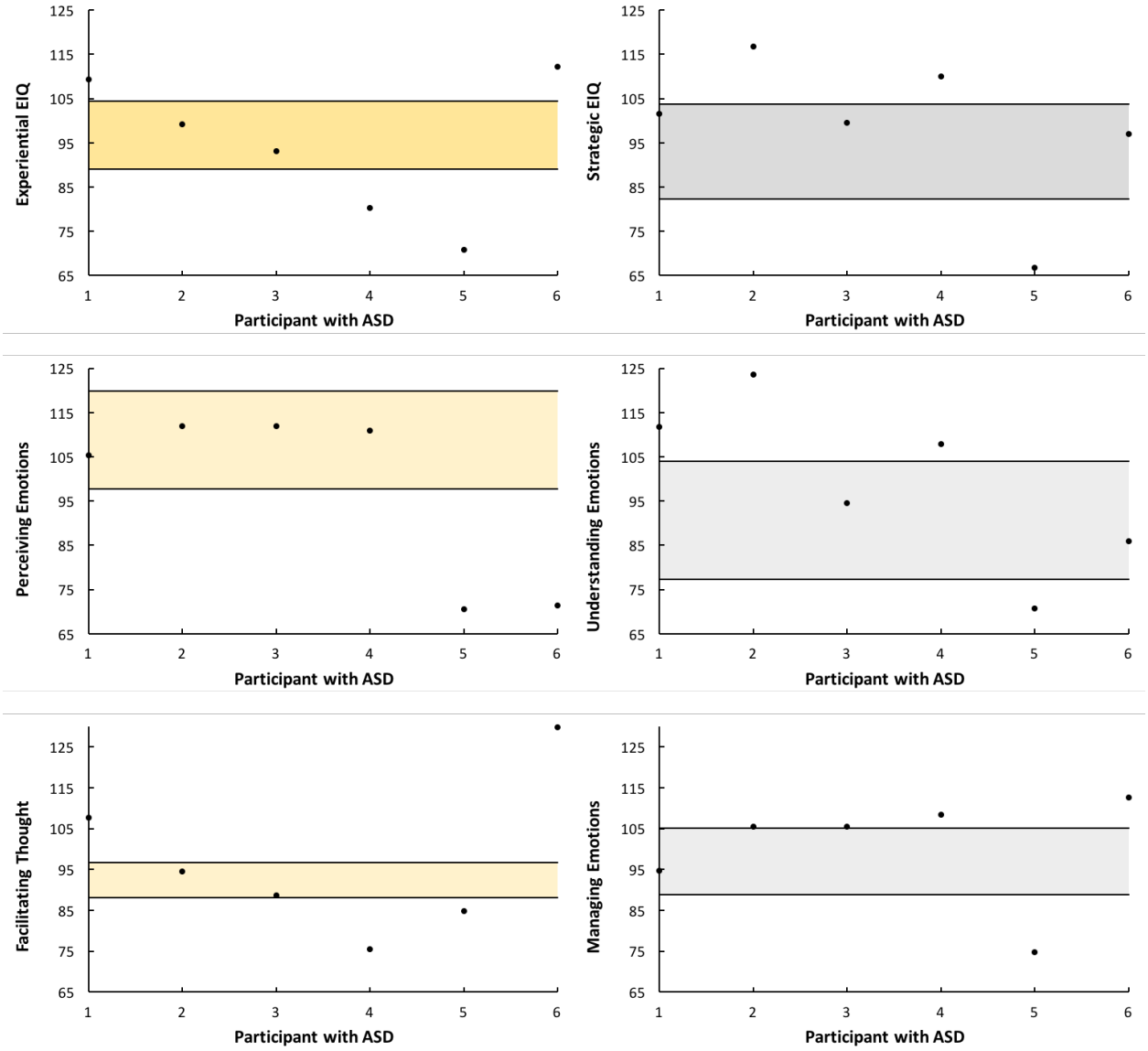

Figure 3. Comparison of children with Autism Spectrum Disorder (ASD) to the typical group's 95% bootstrapped confidence interval (CI) around the median on the Mayer-Salovey-Caruso Emotional Intelligence Test-Youth Version (MSCEIT-YV), a measure of ability emotional intelligence, area and branch scores. In each panel, the shaded region represents the typical group's 95% bootstrapped CI. Dots indicate the performance of the children with ASD.

A subset of this study's participants were younger than the MSCEIT-YV normative sample (i.e., 10- to 17-years-old). As such, in step five, the Spearman Rho correlations between age and raw MSCEIT-YV scores were examined. Although none of the relationships were significant, interesting patterns emerged. For example, raw Experiential and Strategic EI scores

for typically developing children increased slightly with increasing age, but for children with ASD, Experiential EI raw scores decreased slightly whereas Strategic EI raw scores increased (see Figure 4). As such, it appears that as typically developing children age, their ability EI improves as is expected, but this is not necessarily the case for children with ASD.

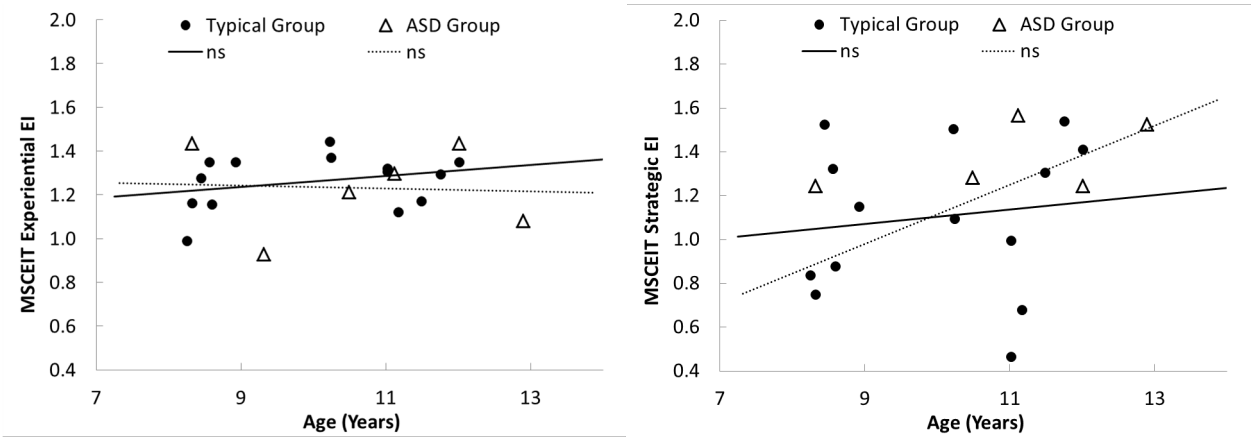

Figure 4. Raw scores on Mayer-Salovey-Caruso Emotional Intelligence Test – Youth Version (MSCEIT-YV) (left panel) Experiential Emotional Intelligence (EI) and (right panel) Strategic EI for typically developing children and children with autism spectrum disorder (ASD).

Mental Health

Anxiety and depression levels of the ASD group and the typically developing group were compared. Group differences did not emerge in any of the children's mental health variables (see Table 5).

Table 5

Group Comparisons in Mental Health Outcomes as Measured by the Behaviour Assessment System for Children, Second Edition (BASC-2)

Variable	ASD Group *Mdn*	Typical Group *Mdn*	*U*	MRD	*P*	Effect Size (*r*)
SRP Anxiety	47.5	47.0	47.5	-1.31	.66	.10

PRS Anxiety	46.0	47.0	39.0	0.71	.84	.06
SRP Depression	44.0	46.5	41.5	0.12	.97	-.01
PRS Depression	65.5	50.0	48.5	-1.54	.60	.12

Note. MRD = Mean Rank Difference, subtracts the mean rank of group 1 from the mean rank of group 2; ASD = autism spectrum disorder; BASC-2 SRP = Behaviour Assessment System for Children, Second Edition Self-Report of Personality; BASC-2 PRS = Behaviour Assessment System for Children, Second Edition Parent Rating Scale.

Relationships between EI and Mental Health Outcomes

One of the main goals of the present study was to examine the relationships amongst trait and ability EI and mental health outcomes. Two-tailed Spearman correlations were examined separately for the group of typical children and the group of children with ASD.

Trait EI. For the ASD group, no significant associations emerged between any facet of trait EI and mental health outcome (see Table 6). In contrast, in the typical group, higher levels of trait EI were associated with lower levels self-reported anxiety and self-reported depression (see Table 6). Similarly, higher scores on the Interpersonal Skills subscale were associated with lower levels of self-reported anxiety and depression. Stress Management was also significantly negatively correlated with self-reported anxiety and depression. There were no significant correlations between any EI score and parent-reported anxiety and depression in the typical group.

Table 6

Correlations between Trait Emotional Intelligence (EI) and the BASC-2 SRP and PRS for Children with Autism Spectrum Disorder (ASD) and Typically Developing Children

	ASD Group				**Typical Group**			
	SRP		**PRS**		**SRP**		**PRS**	
	Anx	**Dep**	**Anx**	**Dep**	**Anx**	**Dep**	**Anx**	**Dep**
Total Trait EI	-.03	.03	-.33	-.03	-.70**	-.72**	-.02	-.31

Intrapersonal Skills	-.32	-.13	-.09	.09	-.38	-.16	-.03	.03
Interpersonal Skills	.03	.02	.06	.37	-.59	-.64*	-.05	-.30
Adaptability	.37	.52	-.71	-.38	-.43	-.42	-.29	-.18
Stress Management	-.71	-.61	-.26	-.75	-.71**	-.82**	-.02	-.46

Note. Anx = Anxiety; Dep = Depression; BASC-2 SRP = Behaviour Assessment System for Children-Second Edition, Self-Report of Personality; BASC-2 PRS = Behaviour Assessment System for Children-Second Edition, Parent-Rating Scale.
*$p < .05$, two-tailed. **$p < .01$, two-tailed.

Ability EI. In the ASD group, higher scores on the Perceiving Emotions subscale of the MSCEIT-YV were associated with higher levels of parent-reported anxiety, and higher scores on Managing Emotions were associated with higher levels of parent-reported depression (see Table 7). In the typical group, several significant associations between ability EI and mental health outcomes emerged (see Table 7). First, higher levels of overall ability EI and higher levels of Strategic EI were associated with lower levels of self-reported depression. Third, higher scores on Managing Emotions were associated with lower self-ratings of anxiety and depression. Finally, higher scores on Facilitating Thought were associated with higher levels of parent-reported anxiety.

Table 7

Correlations between Ability Emotional Intelligence (EI) and the BASC-2 SRP and PRS for Children with Autism Spectrum Disorder and Typically Developing Children

	ASD Group				**Typical Group**			
	SRP		**PRS**		**SRP**		**PRS**	
	Anx	**Dep**	**Anx**	**Dep**	**Anx**	**Dep**	**Anx**	**Dep**
Total Ability EI	-.03	-.23	.14	.03	-.41	-.63*	.04	-.21

Experiential EI	.09	-.03	-.14	.12	.23	-.14	.47	.34
Perceiving Emotions	-.55	-.66	.81*	.46	-.09	-.08	-.19	-.29
Facilitating Thought	.03	.03	-.43	-.17	.49	.09	.54*	.53
Strategic EI	-.20	-.46	.71	.35	-.51	-.68**	-.08	-.28
Understanding Emotions	-.37	-.61	.54	.12	-.21	-.32	-.06	-.16
Managing Emotions	.55	.37	.41	.87*	-.65*	-.81**	-.15	-.40

Note. Anx = Anxiety; Dep = Depression; BASC-2 SRP = Behaviour Assessment System for Children-Second Edition, Self-Report of Personality; BASC-2 PRS = Behaviour Assessment System for Children-Second Edition, Parent-Rating Scale.

*$p < .05$, two-tailed. **$p = .01$, two-tailed.

Relationships between VIQ, EI, and Mental Health

In the ASD group, VIQ was not significantly related to ability EI nor any mental health outcomes. However, a significant positive association emerged between VIQ and Interpersonal Skills ($r_s = .90$, $p = .02$), supporting the idea that verbal concept formation and reasoning abilities are important for forming and maintaining emotionally close relationships.

In the typical group, significant positive correlations were found between VIQ and MSCEIT-YV Total EIQ ($r_s = .63$, $p = .02$) and several subscales ($r_s = .57$ - $.69$). In contrast, VIQ was not significantly related to any element of trait EI. In terms of mental health, significant negative correlations were found between VIQ and self-reported Depression ($r_s = -.63$, $p = .02$) and parent-reported Depression ($r_s = -.54$, $p = .05$), suggesting that higher verbal intelligence is associated with lower levels of some internalizing symptoms in this group.

Personality

Given debate within EI research over the relationship between trait EI and personality (e.g., Conte, 2005; Davies, Stankov, & Roberts; 1998; Davis & Wigelsworth, 2018; De Raad, 2005; McCrae, 2000; Zeidner, 2012), correlations between the BarOn EQ-i: YV(S) and the ICID-S were examined. In the typical group, significant correlations were found between Interpersonal Skills and Agreeableness (r_s = .56, p = .04), Stress Management and Agreeableness (r_s = .72, p = .004), and Stress Management and Neuroticism (r_s = -.71, p = .005). For children with ASD, a positive correlation was found between Adaptability and Extraversion (r_s = .87, p = .02). These moderate to strong associations between various facets of trait EI and the Big 5 personality traits (excluding Openness and Conscientiousness) may support the idea that the two constructs are part of the same underlying construct.

Discussion

Competence and skill in perceiving, understanding, using, and regulating emotions has a profound impact on one's ability to interact effectively with the world. Given this, the present study examined these emotion-related abilities/characteristics in children with ASD using the construct of EI. Specifically, this study compared the trait and ability EI of children (aged 8-12 years) with and without ASD and evaluated the influence of EI on mental health outcomes. This research was intended to help fill a gap in ASD research pertaining to social-emotional impairments and mental health, as EI has been largely unexplored with this population despite its importance for various outcomes for typically developing individuals. Compared to youth who struggle to interact with emotion-laden content/stimuli, youth who are more adept in this area tend to be more likely to experience a variety of a desirable outcomes such as better psychological and physical health (e.g., Johnson & Blanchard, 2016; Martins et al., 2010; Schutte et al., 2007; Tsaousis & Nikolaou, 2005), better developed social skills (e.g., Denham et

al., 2003; Forgas, 2001; Keltner & Kring, 1998; Lopes et al., 2004; Parkinson et al., 2005), and greater academic success (e.g., Malik & Shujja, 2013; Qualter et al., 2012). The picture is relatively bleaker for individuals who experience difficulties in this area as they are at a greater risk for poor psychological, physical, and social outcomes (e.g., mental health problems, low-quality interpersonal relationships, lower academic achievement; e.g., Poulou, 2014). Previous research has suggested that the social and emotional deficits that characterize the symptomatology of ASD intuitively overlaps with the aforementioned areas of emotional competence and skill (e.g., Montgomery et al., 2008). Until recently, much of the research conducted has been on separate facets of emotion-related abilities and characteristics; however, the advent of EI has allowed for the possibility of a more comprehensive assessment of these abilities (River et al., 2012). As such, the present study explored trait and ability EI and their influence on the mental health outcomes of children with 'high-functioning' ASD. It is important to note that the small sample sizes and heterogeneity in scores within the ASD group may have contributed to the absence of significant group differences and relationships between EI variables and mental health outcomes.

Trait EI

At the group level, ability and trait EI did not significantly differ between children with and without ASD in the present study. The small sample size in the present study likely limited power to detect significant group differences. As such, findings regarding group differences in EI are inconclusive. Contrary to prediction, children with ASD were not significantly different from typically developing children on overall trait EI nor on any of the subscales. This finding is consistent with the one other study examining trait EI in children with ASD where children with ASD demonstrated intact trait EI relative to typically developing children (McCrimmon et al.,

2016). The average to high-average VIQ of the children with ASD in this study and the present study may have helped to facilitate their trait EI. For example, because verbal abilities predict trait EI in typically developing individuals (Hogan et al., 2010) and is associated with better ability to identify and match facial expressions in children with ASD (Williams & Gray, 2013) these findings provide support that verbal abilities are implicated in the compensatory strategies that some individuals with ASD use when navigating social situations (APA, 2013; Holliday-Willey, 2015; Hull et al., 2017). As such, because trait EI provides a measure of EI indicating how individuals may behave in their daily life, well-developed verbal abilities may assist these children in compensating for some of the EI deficits they may otherwise experience.

Group comparisons suggesting that children with ASD may not experience deficits in trait EI are encouraging given that trait EI has been found to be impaired in older youth with ASD (e.g., Boily et al., 2017). During childhood, trait EI may be commensurate with typically developing peers and may not decline with increasing age when appropriate supports are put in place. Despite trait EI appearing to be intact relative to typically developing children at the group level, three of the six children with ASD in the present study scored below the typical group's 95% bootstrapped CI around the median for one or more of the trait EI domains. These individual results and the variability that emerged are consistent with the diversity present in the autism spectrum (APA, 2013) and previous research documenting that individuals with ASD struggle with various facets of trait EI. For example, individuals with ASD tend to experience difficulties identifying and understanding their own thoughts and feelings (i.e., Intrapersonal Skills; Bal et al., 2010; Hill et al., 2004) and recognizing and understanding the emotions of others and interacting effectively with others (i.e., Interpersonal Skills; APA, 2013; Bal et al., 2010). Moreover, those with ASD often have difficulties effectively regulating emotions and

internal reactions such as stress (i.e., Stress Management; Samson et al., 2015), and are relatively inflexible and resistant to change (i.e., Adaptability; APA, 2013). Intuitively, it would make sense if the subscale scores of the BarOn EQ-i: YV(S) hypothesized to tap the aforementioned abilities were impaired relative to typically developing children. Given the non-significant group differences in the present study, but apparent deficits in trait EI within individual participants with ASD, it is likely that small sample sizes and heterogeneity between participants with ASD in trait EI served to mask group-level differences. Additionally, because the BarOn EQ-i: YV(S) is a self-report measure, children with ASD may not accurately perceive and/or report on their difficulties in these areas due to pervasive self-awareness issues (Mazefsky, Kao, & Oswald, 2011).

Alternatively, difficulties with trait EI may not emerge or be fully evident until adolescence with the onset of puberty when youth undergo significant neurological changes and begin to experience greater social-emotional demands (Stortelder & Ploegmakers-Burg, 2010). During adolescence, a shift towards greater complexity in social experiences (e.g., more time spent with peers) may be particularly difficult for youth with ASD due to the social impairments they experience. Moreover, during this transitional period, youth with 'high-functioning' ASD may be expected to interact with typically developing peers at a developmental level that taxes and/or exceeds their abilities. These factors, combined with neurological changes that enhance self-reflection during adolescence (Barkai & Rappaport, 2011; Bell, Wieling, & Watson, 2004) may produce conditions such that youth with ASD develop greater awareness of their social-emotional difficulties, which in turn, may result in these individuals acknowledging greater impairment on self-reports of social-emotional functioning. Thus, within the ASD population, trait EI may fluctuate with development in that impairments are not evident in childhood, but

may decline during adolescence into young adulthood if not supported. Indeed, research on the development of functional activity within the brains of individuals with ASD has demonstrated that, in general, development is slower in individuals with ASD compared to neurotypicals (O'Reilly, Lewis, & Elsabbagh, 2017). This is particularly evident for the prefrontal cortex (an area of the brain implicated in various emotion-related abilities) and its connections with other brain regions as it is one of the last brain regions to develop, not reaching maturity until one's mid-twenties (Sowell, Thompson, Holmes, Jernigan, & Toga, 1999). Additionally, connections within the brains of individuals on the spectrum tend to shift from hyper-connected to hypo-connected with age (O'Reilly et al., 2017). This research suggests that differences in patterns of connectivity between individuals with ASD and neurotypicals are not static across development (O'Reilly et al., 2017). As such, it is possible that a shift towards hypo-connectivity along with slower development results in an exacerbation of deficits in EI during adolescence that were not fully evident during childhood. However, because social-emotional deficits are well-accepted to exist in children with ASD (APA, 2013; Bal et al., 2010, Hill et al., 2004, Mazefsky et al., 2014; Samson et al., 2015; Vickerstaff et al., 2007), and in the present study, impairments in trait EI emerged for individual children with ASD, it may be that the measures used in this study had limited sensitivity for detecting trait EI difficulties in this young age group of children with ASD. The inability to identify deficits may result in missed intervention opportunities, resulting in greater impairment in the future.

Ability EI

This was the first study (to my knowledge) to examine ability EI in children with ASD aged 8-12 years. Similar to trait EI, children with ASD (as a group) were comparable to typically developing children on all components of ability EI, suggesting that difficulties perceiving,

understanding, using, and managing emotions may not yet be severe enough to be evident in children with ASD. This contrasts with research examining ability EI in youth with ASD (ages 13-17 years; Boily et al., 2017), which found that youth with ASD scored lower than their typical peers on total ability EI and on the Understanding and Managing Emotions subscales; however, were comparable to typical teens in their ability to perceive and use emotions. These findings may suggest a developmental trend where ability EI is intact in ASD during childhood relative to typically developing peers, but may develop more slowly than is typical, resulting in impairment during adolescence. Moreover, according to Mayer et al. (2014), the ability to understand and manage emotions are relatively more advanced skills. It is possible that as children with ASD enter adolescence their ability to *perceive* and *use* emotions are commensurate to their typically developing peers; however, the development of the more advanced skills of *understanding* and *managing* emotions are delayed compared to typically developing youth. This may point to the importance of interventions targeted at helping youth with ASD understand and regulate emotions rather than on areas of ability EI (i.e., emotion perception and the ability to use emotions to promote certain styles of thinking and action) that may continue to develop adequately on their own. Moreover, the MSCEIT-YV does not have a time limit and provides an indication of whether the test-taker *possesses* emotion-based knowledge. Scores that are contingent upon completion time may offer a measure of ability EI that bears greater similarity to the time pressure present in real-world interactions where individuals do not have ample time to reason their way through situations. As such, this type of approach may better provide information regarding the *application* of emotion-based knowledge. With this type of measure, it is possible greater difficulties may have been experienced by children with ASD.

Some children were younger than the lower age limit on the MSCEIT-YV (10-years-old), so raw scores were examined. In general, ability EI gradually improved with age for the typically developing group, which is consistent with EI theory indicating that EI should increase with age and experience (Rivers et al., 2012). This pattern was particularly evident on Perceiving Emotions and Facilitating Thought, which compose the Experiential EI branch. While scores appeared to increase with age, there was relatively less consistency across age on Strategic EI. The greater variability in scores may have been due to greater item difficulty in that these scales assess relatively more advanced emotion-related abilities (Mayer et al., 2014); as such, there may be greater variation across children in the degree to which these skills are developed. A different pattern emerged for children with ASD in that Experiential EI appeared to decline with age; however, Strategic EI improved with age. This pattern is somewhat surprising considering that Experiential EI is necessary for the development of Strategic EI (Mayer et al., 2014). As such, it may be expected that if Experiential EI declines with age, Strategic EI development may be stunted. However, it could be that Experiential EI is still sufficient for Strategic EI which appears to develop at an accelerated rate in children with ASD compared to their typically developing counterparts. These findings suggest that the developmental trajectory of ability EI may differ for individuals with ASD compared to typically developing individuals and that developers of interventions may consider targeting Experiential EI to help support its continued development, decreasing the likelihood that age-related decline might occur. Additionally, Experiential EI involves basic-level emotion processing and tends to be more self-referential than Strategic EI which involves higher-level processing and is less self-referential (Jacobs et al., 2008). As Experiential EI involves basic emotion processing, which individuals with ASD struggle with (e.g., Hill et al., 2004), development of Experiential EI may attenuate across time. In contrast,

Strategic EI involves sematic knowledge (Jacobs et al., 2008) and so it is possible that Strategic EI may be more amenable to learning through repeated instruction and practice—hence, the improvement with age. This is particularly relevant for individuals with ASD who greatly benefit from direct instruction and rule-based learning (Bar-On Cohen, 2002). Thus, the increase in Strategic EI and decline in Experiential EI across age in the ASD group may reflect a reliance on normative knowledge/rules (e.g., how someone *should* feel in a situation; what someone *should* do to improve their mood in a particular situation) which helps to compensate for attenuated emotional experience (i.e., Experiential EI). Although, this pattern may be unique to this sample and may not reflect an age-related trend in ability EI development for the general population of children with ASD. Thus, future research should consider examining the development of ability EI in children with ASD.

In the present study, scores of individual children with ASD were compared to the 95% bootstrapped CI around the median of the typically developing group. The purpose of this approach was to elucidate the EI profiles of children with ASD relative to typically developing peers. As previously discussed, this provides a useful adjunct to group-level comparisons in which group differences may be obscured by heterogeneity present within the ASD group. Given the small sample of children with ASD recruited in the present study, this approach was particularly useful. While not included within the scope of this study, given the small sample size and heterogeneity of ASD presentation, generating the 95% bootstrapped CI around the median of the ASD group in studies with larger samples and determining whether its range includes the median of the typically developing group, may further shed light on the EI of children with ASD compared to typically developing children. Additionally, an alternative approach to comparing

the EI of children with and without ASD may involve comparing the median of the ASD group to the 95% bootstrapped CI of the typically developing group.

Mental Health Outcomes

Another aim of the present study was to compare levels of anxiety and depression between typically developing children and children with ASD. Children with ASD were expected to exhibit higher levels of anxiety and depression than typically developing children; however, group differences did not emerge. This contrasted with research indicating that children with ASD are more likely to experience mental health problems than typically developing individuals; particularly emotional disorders such as anxiety and depression (e.g., Bellini, 2004; Gadow et al., 2005; Simonoff et al., 2008; Vickerstaff et al., 2007), using 12 times more psychiatric services than the general population (Croen, Najjar, Ray, Lotspeich, & Bernal, 2007). There are potential explanations for these discrepant findings. First, VIQ has been proposed to act as a protective factor against the risk of mental health problems (Ryland, Lundervold, Elgen, & Hysing, 2010). Thus, it is possible that the advanced cognitive abilities of the ASD group in the present study contributed to a decreased risk for anxious and depressive symptoms. Other research suggests that better developed cognitive abilities and verbal skills are associated with an increased risk for anxiety and depression in the ASD population as it may facilitate greater self-awareness of the difficulties these individuals may experience (White et al., 2009; Vickerstaff et al., 2007).

Second, females with ASD are more likely to experience internalizing symptoms than males with ASD who are more likely to experience externalizing symptoms (e.g., hyperactivity, conduct problems; May, Cornish, & Rinehart, 2012; Oswald et al., 2016). Given that the ASD group was almost entirely composed of males and investigated internalizing but not externalizing

disorders, the absence of differences in anxiety and depression between children with and without ASD is not surprising.

Relationships between EI and Mental Health

Trait EI. For children with ASD, self-reported and parent-reported anxiety and depression were not significantly related to any domain of trait EI suggesting that their trait EI may be relatively unrelated to their mental health. In contrast, for typically developing children, significant negative associations were found between self-reported anxiety and depression and total trait EI as well as the Stress Management subscale. This is consistent with previous research suggesting that better developed EI is associated with lower rates of mental health problems in typically developing individuals (Extremera et al., 2007; Martins et al., 2010; Mavroveli et al., 2007). The different relationships between mental health and trait EI observed for the groups of children with and without ASD may reflect variations between the atypical neurological profile possessed by individuals with ASD compared to the neurological profile of children in the typically developing group (Delis, Kaplan, & Kramer, 2001). Specifically, variations in brain connectivity between children with and without ASD (O'Reilly et al., 2017) may result in trait EI impacting anxiety and depression for typically developing children but not for children with ASD.

Ability EI. For children with ASD, only parent-reported anxiety and parent-reported depression were associated with ability EI. Specifically, a significant positive association emerged between parent-reported anxiety and Perceiving Emotions, suggesting that these children tend to be more anxious the more accurate they are in identifying emotions. It is possible that better ability to correctly identify emotions allows for the recognition of emotions in oneself and in others that may be negatively valenced, which may contribute to and exacerbate

symptoms of anxiety. Indeed, anxiety in individuals with 'high-functioning' autism is often exacerbated by greater self-awareness of social difficulties (Vickerstaff et al., 2007). Additionally, a significant positive association emerged between Managing Emotions and parent-reported depression, suggesting that better emotion management skills are associated with higher levels of depression. This is inconsistent with research suggesting that emotion regulation is implicated in the development of psychopathology in which an inability to effectively regulate emotions may result in prolonged periods of psychological distress (Jahromi, Meek, & Ober-Reynolds, 2012). In particular, maladaptive emotion management strategies have been found to increase the risk for psychopathology in both individuals with and without ASD (Rieffe, Camodeca, Pouw, Lange, & Stockmann, 2012). It is possible that because Managing Emotions is a performance-based measure and indicates what the child is capable of, this performance may not necessarily translate into their daily life. As such, this measure of emotion management may not accurately indicate how children with ASD in this study typically tend to manage their emotions in real life situations. As such, a measure of emotion management that is better able to assess how the individual manages emotions in their daily life may yield different results. For example, children with ASD may experience greater difficulty managing negative emotions in more naturalistic contexts, which may explain the levels of depression that their parents reported. Thus, with a measure of emotion management that better reflects what the child does in their daily life, an inverse relationship may emerge in which the poorer one's emotion management skills, the higher their levels of depression.

For typically developing children, significant negative associations were consistently found between mental health outcomes and facets of ability EI. This is consistent with previous research suggesting that better developed ability EI is associated with lower levels of mental

health problems (Davis & Humphrey, 2012). Interestingly, a positive association emerged between parent-reported anxiety and Facilitating Thought. As Facilitating Thought assesses the degree to which one can use emotion-based information to facilitate certain styles of thinking and action, it is possible that this finding reflects a tendency for negative emotion to promote maladaptive thought patterns (e.g., rumination, catastrophization) and actions (e.g., avoidance), both of which are risk factors for and symptoms of anxiety (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Similar to the findings for trait EI, associations between anxiety and depression and ability EI varied between the ASD group and typically developing group. As previously suggested, differing relationships between these constructs may reflect differences in the neurological profiles of children with and without ASD (Delis et al., 2001).

Implications

The results of this study provide preliminary findings regarding the status of trait and ability EI in children with ASD and may have important clinical implications for informing the development of assessments and interventions designed to address deficits in EI in youth with ASD. The results of this study are consistent with a previous study, suggesting that deficits in trait EI may not yet be evident in children with ASD at the group level (McCrimmon et al., 2016). As differences also did not emerge in ability EI between groups of children with and without ASD, taken together, these findings may suggest a developmental trend in EI for individuals with ASD. More specifically, trait and ability EI impairments may not be evident with available measurement tools relative to typically developing peers during childhood, but impairments may emerge during adolescence (Boily et al., 2017) and may not continue to develop at levels commensurate with typically developing individuals if continued development is not supported through intervention efforts. As such, this finding supports the notion that

childhood is an optimal period to intervene (January et al., 2011). Supporting EI development may be particularly important for this population during the transition from childhood to adolescence as they begin to navigate greater social-emotional demands, which may be taxing if EI abilities are not adequately developed. As EI is associated with better outcomes (e.g., Mikolajczak et al., 2009) and improves with training (Castillo et al., 2013; Qualter et al., 2012), it is likely that facilitating EI development will better enable these individuals to effectively manage age-related developmental milestones/challenges (e.g., increased independence, more time spent with peers, increased emotional reactivity). For instance, higher levels of trait EI have been shown to be associated with greater self-efficacy in coping with stressful situations (Mikolajczak & Luminet, 2008; such as complex peer interactions). Moreover, effective coping has been documented as a critical source of resilience for youth at risk for internalizing and externalizing disorders (Compas, Gruhn, & Bettis, 2017); both of which are commonly comorbid with ASD and tend to emerge during adolescence (Bellini, 2004; Vickerstaff et al., 2007). Given these findings, it is promising that the group of children with ASD in this study obtained scores similar to the typically developing group on trait and ability EI, particularly domains associated with coping and emotion management (i.e., Stress Management, Managing Emotions). Supporting the continued development of trait and ability EI from childhood through to adolescence may decrease the likelihood that youth with ASD will avoid social situations which could adversely impact the development of their EI and expand the gap between youth with ASD and their typically developing peers. However, a closer examination of EI in individual children with ASD revealed heterogeneity and impairment in EI.

The heterogeneity of the ASD sample in terms of their strengths and weaknesses on facets of trait and ability EI emphasizes the importance of clinicians tailoring assessment

approaches and interventions to each client. Thus, particularly when working with children on the spectrum, clinicians should be mindful of their clients' unique needs and avoid 'one-size fits all' approaches as they may not be as effective. For example, Participant 4 exhibited difficulty on the BarOn EQ-i: YV(S) Intrapersonal subscale, indicating impairments in foundational self-knowledge and -awareness. In contrast, the other children with ASD in this sample demonstrated intact performance on this subscale. As such, attempts at enhancing intrapersonal skills would be beneficial for Participant 4, but may not be an effective use of time and resources for the other children with ASD who do not show the same impairments. Selecting interventions that are targeted at remediating each client's unique deficits will likely result in more efficient and effective care. This is important because it would likely improve the service experiences of individuals with ASD, and reduce service use and costs as they are often substantially higher for individuals with ASD compared to individuals with psychiatric conditions and typically developing individuals (Croen et al., 2007).

It is also important to note that all facets of EI are not necessarily unequivocally positive. Specifically, the results of this study suggest that for children with ASD, being able to accurately perceive emotion may have deleterious effects on mental health, in terms of increasing anxiety. As such, developers of interventions aimed at enhancing emotion recognition in children with ASD should consider whether the ability to accurately identify emotion, especially negative emotion, may have adverse consequences. In turn, as an adjunct to interventions aimed at improving emotion recognition, clinicians may consider incorporating lessons regarding dealing with and responding to negative emotion from others and strategies for coping with negative emotion. Incorporating strategies such as these may decrease the likelihood that children with ASD will experience adverse psychological consequences (e.g., symptoms of anxiety and

depression). Likewise, for typically developing children, the ability to use emotion to facilitate thought was associated with higher levels of anxiety and depression. This contrasts with research in adults where a negative relationship between the ability to use emotions to promote thought and symptoms of social anxiety has been demonstrated (Jacobs et al., 2008). This may suggest that during childhood, typically developing children may be at risk for using emotion-based information to facilitate styles of thinking and acting that characterize anxiety and depression (e.g., rumination, catastrophization, and avoidance). Indeed, thought patterns associated with anxiety and depression, such as rumination, tend to develop during childhood and decrease with age (Sutterlin, Paap, Babic, Walferdange, & Vogele, 2012). It may be that thought patterns such as rumination explain the positive relationship between Using Emotions and anxiety/depression in this age group of typically developing children. Additionally, this finding may suggest that early warning signs for the later development of anxiety and mood disorders are related to the ways in which emotion-based information influences children's thought patterns and may be evident as early as 8-years-old. Thus, clinicians working with typically developing children who may be at risk for experiencing emotional disorders should consider paying particular attention to how these children use emotion-related information and how this affects their thinking styles and behaviours.

Furthermore, the results of this study contribute to the debate regarding the construct validity and utility of trait EI. Specifically, the significant associations that emerged between the Big Five personality traits and domains of trait EI provide support that there may be considerable overlap between trait EI and personality. As such, research should continue to evaluate the construct validity of trait EI.

Strengths and Limitations

A major strength of the present study is that the heterogeneity of individuals with ASD were considered during the analyses. The scores of each child with ASD on measures of EI were compared to the 95% bootstrapped CI of the typically developing group's median, which revealed heterogeneity across subscales assessing facets of trait and ability EI across and within participants with ASD. The variability in scores is consistent with the nature of a spectral condition, in that each individual with ASD exhibits a unique set of symptoms varying in presentation, type, and severity.

Despite being the first study to examine ability EI (to my knowledge) and the second study to examine trait EI in children with ASD (ages 8-12 years), thereby beginning to elucidate an under-researched area within ASD literature, there were several limitations. First, recruiting from clinical populations such as the ASD population can be difficult and time-consuming (Beadle-Brown et al., 2012). Further, as this study recruited 'high-functioning' children with ASD, recruitment was likely made more difficult by the possibility that an ASD diagnosis was likely made relatively recently, and, thus, still new to the child and their family. This was matched with difficulty recruiting typically developing children. Consequently, this resulted in sample sizes much smaller than anticipated, which limited statistical power to detect group differences and associations between variables of interest. Additionally, the absence of correction procedures when making multiple comparisons may have inflated the risk of making type I errors; however, it minimized the risk of making type II errors which was considered a greater possibility. As such, the results of this study should be considered exploratory and interpreted with caution.

Second, there are several considerations regarding the generalizability of the findings. While the heterogeneity evident within the ASD sample in this study was consistent with and

supports the heterogeneous nature of the autism spectrum, due to the small sample of children with ASD included in this study, the children who participated in this study may not be representative of the larger population of 'high-functioning' children with ASD. Moreover, as the children and their parents/caregivers who participated in this study self-referred to participate, it is possible that this introduced selection bias. Specifically, it is possible that the children (and their parents/caregivers) who participated in this study were qualitatively different from those who did not elect to participate, which may have impacted quantitative findings. Additionally, five out of six children in the ASD group were male, and while this closely resembles the gender ratio of 4:1 male to female in the ASD population (APA, 2013), the findings of this study may not be as applicable to females with ASD. Consequently, these factors may limit the generalizability of the findings to females with ASD.

Third, the MSCEIT-YV is intended for use with children aged 10 years and older. While the test-publisher acknowledges that it is under the researcher's discretion to use the measure with children younger than 10-years-old, it is not recommended. In this study, children aged 8 and 9-years-old were administered the MSCEIT-YV which generated standard scores. As such, their standard scores may be underestimates of their actual ability as their scores were generated based on norms for 10-year-olds. As their standard scores were included in most analyses conducted in this study, it is possible that this influenced the results.

Fourth, self-report measures were used to assess many variables of interest. In general, this practice is considered acceptable with typically developing populations, however, there is greater skepticism regarding the accuracy of responses provided by individuals with ASD (e.g., Meyer, Mundy, Van Hecke, & Durocher, 2006; Montgomery et al., 2008). This issue is particularly pertinent to the present study as various measures required individuals to reflect and

report on their own emotions; which individuals with ASD tend to struggle with (Shalom et al., 2006). As such, because the BASC-2 SRP and BarOn EQ-i: YV(S) are self-report measures and many of the items pertain to emotions, caution may be warranted when interpreting the results; however, validity scales indicated that, in general, results can be interpreted as valid.

Future Directions

Given the aforementioned limitations, future research should attempt to replicate these results; addressing these limitations and recruiting a larger sample to enhance statistical power. Considering that the results of this study suggest that there may be a developmental trend in EI development in youth with ASD in which it is intact (relative to typically developing peers) in childhood but may decline as children transition into adolescence, future research should consider conducting longitudinal studies to evaluate the development of EI in this population. This may have important implications for the development and timing of EI interventions.

Additionally, future research may consider examining EI in individuals with ASD using alternative approaches. First, other-reports of EI (e.g., peer reports, parent-reports) may be used as it may help to eliminate the influence of social desirability bias and impaired self-awareness that plague self-reports (Furnham & Craig, 1987). This may be particularly useful for assessing EI in youth with ASD considering that research suggests that they may minimize their difficulties and have impaired self-awareness (e.g., Meyer et al., 2006; Montgomery et al., 2008).

Currently, the MSCEIT-YV is the predominant measure of ability EI in youth. As ability EI has been shown to impact various areas of life, and childhood is considered an optimal period to intervene should difficulties exist, researchers should consider developing measures of ability EI for younger groups of children (i.e., younger than 10 years old). Moreover, considering the differences in brain connectivity between individuals with and without ASD researchers should

consider conducting factor analytic studies to evaluate whether the MSCEIT-YV and BarOn EQ-i: YV(S) are valid measures of ability and trait EI, respectively, in individuals with ASD and/or whether the factor structure of these measures differ between typically developing children and children with ASD. This may have implications for our understanding of ability EI and trait EI in youth with ASD and how it compares to typically developing youth.

Finally, given the present study is limited in the conclusions it can make regarding the relationship between trait EI and personality in typically developing children and children with ASD, future research should continue to assess the utility of trait EI through evaluating the associations between trait EI and the Big Five personality traits and determining whether trait EI offers unique information in the prediction of important outcomes for both typically developing individuals and individuals with ASD.

Conclusions

EI impairments are risk factors for the development of mental health problems in typically developing individuals (Davis & Humphrey, 2012; Extremera et al., 2007; Martins et al., 2010; Mavroveli et al., 2007); with recent research suggesting the same for certain age groups of individuals with ASD (e.g., Montgomery et al., 2013). In light of the profound impact that emotions have on many life areas, and the difficulties that individuals with ASD tend to experience with social-emotional information/situations (APA, 2013), the EI construct may offer the potential to identify strengths and/or deficits in this population. Moreover, as ability (Castillo et al., 2013) and trait (Qualter et al., 2012) EI improve with training, deficits could be remediated and its development supported. Although EI research with the ASD population is increasing, it is still underrepresented in the extant ASD literature that is focused on identifying social-emotional impairments and potential routes to remediation. This is unfortunate considering that existing

research indicates that EI influences outcomes for adolescents and young adults with ASD (e.g., Montgomery et al., 2008; 2010; 2013). Childhood offers an optimal window to intervene (January et al., 2011); however, there is a paucity of research examining EI in children with ASD. This is troubling considering that research suggests impairment in EI for older age groups of individuals with ASD (e.g., Boily et al., 2017; Brady et al., 2014; Montgomery et al., 2008) and because individuals with ASD are at greater risk to suffer poor psychosocial outcomes (e.g., anxiety, depression) relative to typically developing individuals (Bellini, 2004; Deckers et al., 2007; Gadow et al., 2005; Vickerstaff et al., 2007). ASD.

The preliminary findings of this study suggest that children with ASD (as a group) may not experience deficits in trait and ability EI compared to typically developing children. Combined with the results of previous research with older youth with ASD (e.g., Boily et al., 2017), the results of this study may suggest a developmental trajectory in which EI appears comparable to typically developing peers in childhood (as measured with currently available tools) but may decline during the transition into adolescence. The findings of the present study are encouraging as they suggest that if EI development is proactively supported during childhood, deficits may not emerge. Moreover, EI may be uniquely related to the mental health in children with ASD. Specifically, given that only ability EI was associated with mental health outcomes for children with ASD, more research is needed to determine how to best incorporate ability EI interventions and how it may impact their mental health. Consideration of how to effectively incorporate EI-related approaches into mental health interventions for children with ASD may contribute to more effective care, decreasing the likelihood that mental health problems may emerge, and ultimately improved quality of life for individuals with ASD.

References

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30,* 217-237. doi: 10.1016/j.cpr.2009.11.004

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Anderson, D. K., Maye, M. P., & Lord, C. (2011). Changes in maladaptive behaviours from mid-childhood to young adulthood in autism spectrum disorder. *American Journal on Intellectual and Developmental Disabilities, 116*(5), 381-397. doi: 10.1352/1944-7558-116.5.381

Attwood, T. (2003). Frameworks for behavioural interventions. *Child and Adolescent Psychiatric Clinics, 12*, 65-86. doi; 10.1016/S1056-4993(02)00054-8

Bal, E., Harden, E., Lamb, D., Van Hecke, A. V., Denver, J. W., & Porges, S. W. (2010). Emotion recognition in children with autism spectrum disorders: Relation to eye gaze and autonomic state. *Journal of Autism and Developmental Disorders, 40*(3), 358-370. doi: 10.1007/s10803-009-0884-3

Barkai, A. R., & Rappaport, N. (2011). A psychiatric perspective on narratives of self-reflection in resilient adolescents. *Adolescent Psychiatry, 1*(1), 46-54. Retrieved from http://www.ingentaconnect.com/content/ben/aps/2011/00000001/00000001/art00009

Baroncelli, A., & Ciucci, E. (2014). Unique effects of different components of trait emotional intelligence in traditional bullying and cyberbullying. *Journal of Adolescence, 37*(6), 807-815. doi: 10.1016/j.adolescence.2014.05.009

Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in Cognitive Sciences,*

6(6), 248-254. Retrieved from http://cogsci.bme.hu/~ivady/bscs/read/bc.pdf

Bar-On, R. (2006). The Bar-On model of emotional-social intelligence (ESI). *Psichothema, 18*, 13-25. Retrieved from http://www.psicothema.com/pdf/3271.pdf

Bar-On, R., & Parker, J. D. (2001). The Bar-On Emotional Quotient Inventory: Youth Version (EQ-i: YV) technical manual. Toronto: Multi-Health Systems.

Beadle-Brown, J., Ruan, S., Windle, K., Holder, J., Turnpenny, A., Smith, N.,…& Whelton, B. (2012). Engagement of people with long term conditions in health and social care research: Barriers and facilitators to capturing the views of seldom-heard populations. *Canterbury: Quality and Outcomes of Person-Centered Care Policy Research Unit, University of Kent.*

Bell, N. J., Wieling, E., & Watson, W. (2004). Self-reflecting in developmental context: Variations in level and patterning during the first 2 university years. *The Journal of Genetic Psychology, 165*(4), 451-465. doi: 10.3200/GNTP.165.4.451-465

Bellini, S. (2004). Social skill deficits and anxiety in high-functioning adolescents with autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities, 19*(2), 78-86. doi: 10.1177/1088357604019002

Bender, R., & Lange, S. (2001). Adjusting for multiple testing-when and how? *Journal of Clinical Epidemiology, 54,* 343-349. doi: 10.1016/S0895-4356(00)00314-0

Boily, R., Kingston, S. E., & Montgomery, J. M. (2017). Trait and ability emotional intelligence in adolescents with and without autism spectrum disorder. *Canadian Journal of School Psychology, 32*(3-4), 282-298. doi: 10.1177/0829573517717160

Boyatzis, R. E., Goleman, D., & Rhee, K. (2000). Clustering competence in emotional intelligence: Insights from the Emotional Competence Inventory (ECI). In R. Bar-On &

J. D. A. Parker (Eds.), *The Handbook of Emotional Intelligence: Theory, Development, Assessment, and Application at Home, School, and in the Workplace* (pp. 343-362). San Francisco: Jossey-Bass.

Brackett, M. A., Mayer, J. D., & Warner, R. M. (2004). Emotional intelligence and its relation to everyday behaviour. *Personality and Individual Differences, 36*(6), 1387-1402. doi: 10.1016/S0191-8869(03)00236-8

Brace, N., Kemp, R., & Snelgar, R. (2006). *SPSS for psychologists.* London: Lawrence Earlbaum Associates.

Brady, D. I., Saklofske, D. H., Schwean, V. L., Montgomery, J. M., McCrimmon, A. W., Throne, K. J. (2014). Cognitive and emotional intelligence in young adults with autism spectrum disorder without an accompanying intellectual or language disorder. *Research in Autism Spectrum Disorders, 8*(9), 1016-1023. doi: 10.1016/j.rasd.2014.05.009

Castillo, R., Salguero, J. M., Fernandez-Berrocal, P., & Balluerka, N. (2013). Effects of an emotional intelligence intervention on aggression and empathy among adolescents. *Journal of Adolescence, 36,* 883-892. doi: 10.1016/j.adolescence.2013.07.001

Chandler, S., Charman, T., Baird, G., Simonoff, E., Loucas, T., Meldrum, D., … Pickles, A. (2007). Validation of the social communication questionnaire in a population cohort of children with autism spectrum disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 46*, 1324-1332. doi: 10.1097/chi.0b013e31812f7d8d

Chen, H., Mechanic, D., & Hansell, S. (1998). A longitudinal study of self-awareness and depressed mood in adolescence. *Journal of Youth and Adolescence, 27*(6), 719-734. doi: 10.1023/A:1022809815567

Climie, E. (2012). *Emotional intelligence and social skills abilities in children with attention-*

deficit/hyperactivity disorder (Unpublished doctoral dissertation). University of Calgary, Alberta.

Cole, P. M., & Michel, M. K. (1994). The development of emotion regulation and dysregulation: A clinical perspective. *Monographs of the Society for Research in Child Development, 59*, 73-100. doi: 10.1111/j.1540-5834.1994.tb01278.x

Compas, B. E., Gruhn, M., & Bettis, A. H. (2017). Risk and resilience in child and adolescent psychopathology. In T. P. Beauchaine & S. P. Hinshaw (eds,), *Child and adolescent psychopathology* (p. 126). Hoboken, NJ: Wiley.

Conte, J. M. (2005). A review and critique of emotional intelligence measures. *Journal of Organizational Behaviour, 26*, 433-440. doi: 10.1002/job.319

Croen, L. A., Najjar, D. V., Ray, T. G., Lotspeich, L., & Bernal, P. (2007). A comparison of health care utilization and costs of children with and without autism spectrum disorders in a large group-model health plan. *Journal of the Academy of Child & Adolescent Psychiatry, 46*(4), 523. Retrieved from http://search.proquest.com.uml.idm.oclc.org/docview/62030155?accountid=14569

Davies, M., Stankov, L., & Roberts, R. (1998). Emotional intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology, 75*, 989-1015. doi: 10.1037/0022-3514.75.4.989

Davis, S. K., & Humphrey, N. (2012). Emotional intelligence predicts adolescent mental health beyond personality and cognitive ability. *Personality and Individual Differences, 52*(2), 144-149. doi: 10.1016/j.paid.2011.09.016

Davis, S. K., & Wigelsworth, M. (2018). Structural and predictive properties of the Emotional Quotient Inventory Youth Version-Short Form (EQ-i:YV[S]). *Journal of Personality Assessment, 100*(2), 197-206. doi: 10.1080/00223891.2017.1280502

Deal, J. E., Halverson, C. F., Martin, R. P., Victor, J., & Baker, S. (2007). The inventory of children's individual differences: Development and validation of a short version. *Journal of Personality Assessment, 89*(2), 162-166. doi: 10.1080/00223890701468550

Deckers, A., Muris, P., & Roelofs, J. (2007). Being on your own or feeling lonely? Loneliness and other social variables in youths with autism spectrum disorders. *Child Psychiatry & Human Development, 28*(1), 1-12. doi: 10.1007/s10578-016-0707-7

Delis, D. C., Kaplan, E., & Kramer, J. (2001). *Delis-Kaplan executive function system (D-kefs): Technical manual.* San Antonio, TX: Harcourt.

De Raad, B. (2005). The trait-coverage of emotional intelligence. *Personality and Individual Differences, 38*(3)*,* 673-687. doi: 10.1016/j.paid.2004.05.022

Ehlers, S., Gillberg, C., & Wing, L. (1999). A Screening questionnaire for Asperger Syndrome and other high-functioning autism spectrum disorders in school age children. *Journal of Autism and Developmental Disorders, 29*(2), 129-141. doi: 10.1023/A:1023040610384

Extremera, N., Duran, A., & Rey, L. (2007). Perceived emotional intelligence and dispositional optimism-pessimism: Analyzing their role in predicting psychological adjustment among adolescents. *Personality and Individual Differences, 42*(6), 1069-1079. doi: 10.1016/j.paid.2006.09.014

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191. doi: 10.3758/BF03193146

Forgas, J. P. (2001). Emotional intelligence and empathic accuracy. In J. J. Ciarrochi, J. P. Forgas, and J. D. Mayer, eds., *Emotional Intelligence in Everyday Life*. Philadelphia: Psychology Press, pp. 46-63.

Frederickson, N., Petrides, K. V., & Simmonds, E. (2012). Trait emotional intelligence as a predictor of socioemotional outcomes in early adolescence. *Personality and Individual Differences, 52*(3), 323-328. doi: 10.1016/j.paid.2011.10.034

Furnham, A., & Craig, S. (1987). Fakability and correlates of the perception and preference inventory. *Personality and Individual Differences, 8*(4), 459-470. doi: 10.1016/0191-8869(87)90207-8

Gadow, K. D., DeVincent, C. J., Pomeroy, J., & Azizan, A. (2005). Comparison of DSM-IV symptoms in elementary school-age children with PDD versus clinic and community samples, *9*(4), 392-415. doi: 10.1177/1362361305056079

George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 Update.* Boston: Pearson.

Ghaziuddin, M., Weidmer-Mikhail, E., & Ghaziuddin, N. (1998). Comorbidity of Asperger syndrome: A preliminary report. *Journal of Intellectual Disability Research, 42*(4), 279-283. doi: 10.1111/j.1365-2788.1998.tb01647.x

Goin-Kochel, R. P., & Cohen, R. (2008). Screening cases within a statewide autism registry: A comparison of parental reports using DSM-IV-TR criteria versus the SCQ. *Focus on Autism and Other Developmental Disabilities, 23*, 148-154. doi: 10.1177/1088357608316270

Hill, E., Berthoz, S., & Frith, U. (2004). Brief report: Cognitive processing of own emotions in individuals with autistic spectrum disorder and in their relatives. *Journal of Autism and Developmental Disorders, 34*(2), 229-235. doi: 10.1023/B:JADD.0000022613.41399.14

Hodzic, S., Scharfen, J., Ripoll, P., Holling, H., & Zenasni, F. (2017). How efficient are emotional intelligence trainings: A meta-analysis. *Emotion Review, 10*(2), 138-148. doi: 10.1177/1754073917708613

Hogan, M. J., Parker, J. D. A., Wiener, J., Watters, C., Wood, L. M., & Oke, A. (2010). Academic success in adolescence: Relationships among verbal IQ, social support and emotional intelligence. *Australian Journal of Psychology, 62*(1), 30-41. doi: 10.1080/00049530903312881

Holliday Willey, L. (2015). *Pretending to be normal: Living with Asperger's Syndrome (Autism Spectrum Disorder) (Expanded Edition).* London: Jessica Kingsley.

Holtmann, M., Bolte, S., & Poustka, F. (2007). Attention deficit hyperactivity disorder symptoms in pervasive developmental disorders: Association with autistic behavior domains and coexisting psychopathology. *Psychopathology, 40*, 172-177. doi: 10.1159/000100007

Hudepohl, M. B., Robins, D. L., King, T. Z., & Henrich, C. C. (2015). The role of emotion perception in adaptive functioning of people with autism spectrum disorders. *Autism, 19*(1), 107-112. doi: 10.1177/1362361313512725

Hull, L., Petrides, K. V., Allison, C., Smith, P., Baron-Cohen, S., Lai, Meng-Chuan, & Mandy, W. (2017). "Putting on my best normal": Social camouflaging in adults with autism spectrum conditions. *Journal of Autism and Developmental Disorders, 47*(8), 2519-2534. doi: 10.1007/s10803-017-3166-5

Irby, S. M., & Floyd, R. G. (2013). Review of Wechsler abbreviated scale of intelligence, second edition. *Canadian Journal of School Psychology, 28*(3), 295-299. doi: 10.1177/0829573513493982

Jacobs, M., Snow, J., Geraci, M., Vythilingam, M., Blair, R. J. R., Charney, D. S., Pine, D. S., & Blair, K. S. (2008). Association between level of emotional intelligence and severity of anxiety in generalized social phobia. *Journal of Anxiety Disorders, 22*(8), 1487-1495. doi: 10.1016/j.janxdis.2008.03.003

Jahromi, L. B., Meek, S. E., & Ober-Reynold, S. (2012). Emotion regulation in the context of frustration in children with high functioning autism and their typical peers. *Journal of Child Psychology and Psychiatry, 53*(12), 1250-1258. doi: 10.1111/j.1469-7610.2012.02560.x

January, A. M., Casey, R. J., & Paulson, D. (2011). A meta-analysis of classroom-wide interventions to build social skills: Do they work?. *School Psychology Review, 40*(2), 242-256. Retrieved from http://web.b.ebscohost.com.uml.idm.oclc.org/ehost/pdfviewer/pdfviewer?sid=6c1580f8-56ef-4826-a99e-1f40c805b2dc%40sessionmgr104&vid=0&hid=128

Jarrold, C., & Brock, J. (2004). To match or not to match? Methodological issues in autism-related research. *Journal of Autism and Developmental Disorders, 34*(1)*,* 81-86. doi: 10.1023/B:JADD.0000018078.82542.ab

Johnson, S. K., & Blanchard, A. (2016). Emotional intelligence and mental health: Stress and symptom reporting pathways. *Journal of Mental Health Counselling, 38*(1), 79-92. doi: 10.17744/mehc.38.1.06

Joseph, D. L., & Newman, D. A. (2010). Discriminant validity of self-reported emotional intelligence: A multitrait-multisource study. *Educational and Psychological Measurement, 70*(4), 672-694. doi: 10.1177/0013164409355700

Joseph, D. L., & Newman, D. A. (2010). Emotional intelligence: An integrative meta-analysis and cascading model. *Journal of Applied Psychology, 95*, 54-78. doi: 10.1037/a00117286

Keltner, D., & Kring, A. M. (1998). Emotion, social function, and psychopathology. *Review of General Psychology, 2*(3), 320-342. Retrieved from http://uml.idm.oclc.org/login?url=http://search.proquest.com.uml.idm.oclc.org/docview/619357031?accountid=14569

Laurent, A. C., & Rubin, E. (2004). Challenges in emotion regulation in Asperger's syndrome and high-functioning autism. *Topics in Language Disorders, 24*, 286-297. doi: 10/1037/a0027975

Lazarus, R. S. (1991). *Emotion and Adaptation*. New York: Oxford University Press.

Lomas, J., Stough, C., Hansen, K., & Downey, L. A. (2012). Brief report: Emotional intelligence, victimisation and bullying in adolescents. *Journal of Adolescence, 35*(1), 207-211. doi: 10.1016/j.adolescence.2011.03.002

Lopes, P. N., Brackett, M. A., Nezlek, J. B., Schutz, A., Sellin, I., & Salovey, P. (2004). Emotional intelligence and social interaction. *Personality and Social Psychology Bulletin, 30*(8), 1018-1034. doi: 10.1177/0146167204264762

Malik, F., & Shujja, S. (2013). Emotional intelligence and academic achievement: Implications for children's performance in schools. *Journal of the Indian Academy of Applied Psychology, 39*(1), 51-59. Retrieved from

http://uml.idm.oclc.org/login?url=http://search.proquest.com.uml.idm.oclc.org/docview/1315878628?accountid=14569

Mandy, W., Chilvers, R., Chowdhury, U., Salter, G., Seigal, A., & Skuse, D. (2012). Sex differences in autism spectrum disorder: Evidence from a large sample of children and adolescents. *Journal of Autism and Developmental Disorders, 42*(7), 1304-1313. doi: 10.1007/s10803-011-1356-0

Martins, A., Ramalho, N., & Morin, E. (2010). A comprehensive meta-analysis of the relationship between Emotional Intelligence and health. *Personality and Individual Differences, 49*(6), 554-564. doi: 10.1016/j.paid.2010.05.029

Mavroveli, S., Petrides, K. V., Rieffe, C., & Bakker, F. (2007). Trait emotional intelligence, psychological well-being and peer-rated social competence in adolescence. *British Journal of Developmental Psychology, 25*(2), 263-275. doi: 10.1348/026151006X118577

Mavrovelli, S., Petrides, K. V., & Sangareau, Y. (2009). Exploring the relationships between trait emotional intelligence and objective socio-emotional outcomes in childhood. *British Journal of Educational Psychology, 79*(2), 259-272. doi: 10.1348/000709908X368848

May, T., Cornish, K., & Rinehart, N. J. (2012). Gender profiles of behavioral attention in children with autism spectrum disorder. *Journal of Attention Disorders, 20*(7), 627-635. doi: 10.1177/1087054712455502

Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2001). Emotional intelligence as a standard intelligence. *Emotion, 1*(3), 232-242. doi: 10.1037//1528-3542.1.3.232

Mayer, J. D., Salovey, P., & Caruso, D. R. (2014). Mayer-Salovey-Caruso Emotional Intelligence Test Youth Version (MSCEIT: YV) Manual. Canada: Multi-Health Systems Inc.

Mayes, S. D., Calhoun, S. L., Murrsy, M. J., Morrow, J. D., Yurich, K. K. L., Mahr, F., …Peterson, C. (2009). Comparison of scores on the checklist for Autism Spectrum Disorder, Childhood Autism Rating Scale, and Gilliam Asperger's Disorder Scale for children with low functioning autism, high functioning autism, Asperger's disorder, ADHD, and typical development. *Journal of Autism and Developmental Disorders, 39*(12), 1682-1693. doi: 10.1007/s10803-009-0812-6

Mazefsky, C. A. (2015). Emotion regulation and emotional distress in autism spectrum disorder: Foundations and considerations for future research. *Journal of Autism and Developmental Disorders, 45*(11), 3405-3408. doi: 10.1007/s10803=015-2602-7

Mazefsky, C. A., Borue, X., Day, T. N., Minshew, N. J. (2014). Emotion regulation patterns in adolescents with high-functioning autism spectrum disorder: Comparison to typically developing adolescents and association with psychiatric symptoms. *Autism Research, 7*(3), 344-354. doi: 10.1002/aur.1366

Mazefsky, C. A., Kao, J., & Oswald, D. P. (2011). Preliminary evidence suggesting caution in the use of psychiatric self-report measures with adolescents with high-functioning autism spectrum disorders. *Research in Autism Spectrum Disorders, 5*(1), 164-174. doi: 10.1016/j.rasd.2010.03.006

McCrae, R. R. (2000). Emotional intelligence from the perspective of the five-factor model of personality. In R. Bar-On & J. D. A. Parker (Eds.), *The handbook of emotional intelligence: Theory, development, assessment, and application at home, school, and in the workplace* (pp. 263-276). San Francisco, CA, US: Jossey-Bass.

McCrimmon, A. W., Matchullis, R. L., & Altomare, A. A. (2016). Resilience and emotional intelligence in children with high-functioning autism spectrum disorder. *Developmental Neurorehabilitation, 19*(3), 154-161. doi: 10.3109/17518423.2014.927017

McLaughlin, K. A, Hatzenbuehler, M. L., Mennin, D. S., & Nolen-Hoeksema, S. (2011). Emotion dysregulation and adolescent psychopathology: A prospective study. *Behaviour Research and Therapy, 49*, 544-554. doi: 10.1016/j.brat.2011.06.003

Meyer, J. A., Mundy, P. C., Van Hecke, A. V., & Durocher, J. S. (2006). Social attribution processes and comorbid psychiatric symptoms in children with Asperger syndrome. *Autism: The International Journal of Research and Practice, 10*(4), 383-402. doi: 10.1177/1361306064435

Mikolajczak, M., & Luminet, O. (2008). Trait emotional intelligence and the cognitive appraisal of stressful events: An exploratory study. *Personality and Individual Differences, 44,* 1445-1453. doi: 10.1016/j.paid.2007.12.012

Mikolajczak, M., Petrides, K. V., & Hurry, J. (2009). Adolescents choosing self-harm as an emotion regulation strategy: The protective role of trait emotional intelligence. *British Journal of Clinical Psychology, 48*(2), 181-193. doi: 10.1348/014466508X386027

Miners, C. T. H., Côté, S., & Lievens, F. (2018). Assessing the validity of emotional intelligence measures. *Emotion Review, 10*(1), 87-95. doi: 10.1177/1754073917693688

Montgomery, J. M., McCrimmon, A. W., Schwean, V. L., & Saklofske, D. H. (2010). Emotional intelligence in Asperger syndrome: Implications of dissonance between intellect and affect. *Education and Training in Autism and Developmental Disabilities, 45*(4), 566-582. Retrieved from

http://uml.idm.oclc.org/login?url=http://search.proquest.com.uml.idm.oclc.org/docview/817616701?accountid=14569

Montgomery, J. M., Schwean, V. L., Burt, J. A. G., Dyke, D. I., Thorne, K. J., Hindes, Y. L., … & Kohut, C. S. (2008). Emotional intelligence and resiliency in young adults with Asperger's disorder: Challenges and opportunities. *Canadian Journal of School Psychology, 23*(1), 70-93. doi: 10.1177/0829573508316594

Montgomery, J. M., Stoesz, B. M., & McCrimmon, A. W. (2013). Emotional intelligence, theory of mind, and executive functions as predictors of social outcomes in young adults with Asperger syndrome. *Focus on Autism and Other Developmental Disabilities, 28*(1), 4-13. doi: 10.1177/1088357612461525

Murphy, K. R. (2006). Four Conclusion About Emotional Intelligence. In K. R. Murphy (Ed.), *A critique of emotional intelligence: What are the problems and how can they be fixed?* (pp. 345-354). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Nelis, D., Kotsou, I., Quoidbach, J., Hansenne, M., Weytens, F., Dupuis, P., & Mikolajczak, M. (2011). Increasing emotional competence improves psychological and physical well-being, social relationships, and employability. *Emotion, 11*(2), 354-366. doi. 10.1037/a0021554

Nelis, D., Quoidbach, J., Mikolajczak, M., & Hansenne, M. (2009). Increasing emotional intelligence: (How) is it possible?. *Personality and Individual Differences, 47*(1), 36-41. doi: 10.1016/j.paid.2009.01.046

Nyklicek, I., Schalken, P., & Meerteens, S. (2015). The role of emotional intelligence in symptom reduction after psychotherapy in a heterogeneous psychiatric sample. *Comprehensive Psychiatry, 57,* 65-72. doi: 10.1016/j.comppsych.2014.11.022

O' Conner, R. M., & Little, I. S. (2003). Revisiting the predictive validity of emotional intelligence: Self-report versus ability-based measures. *Personality and Individual Differences, 35,* 1893-1902. doi: 10.1016/S0191-8869(03)00038-2

O'Reilly, C., Lewis, J. D., & Elsabbagh, M. (2017). Is functional brain connectivity atypical in autism? A systematic review of EEG and MEG studies. *PLoS One, 12*(5), 1-28. doi: 10.1371/journal.pone.0175870

Sex differences in internalizing problems during adolescence in autism spectrum disorder. *Journal of Autism and Developmental Disorders, 46*(2), 624-636. doi: 10.1007/s10803-015-2608-1

Ozsivadijan, A., Hibberd, C., & Hollocks, M. J. (2014). Brief report: The use of self-report measures in young people with autism spectrum disorder to access symptoms of anxiety, depression and negative thoughts. *Journal of Autism and Developmental Disorders, 44*(4), 969-974. doi: 10.1007/s10803-013-1937-1

Parkinson, B., Fischer, A. H., & Manstead, A. S. R. (2005). *Emotions in Social Relations: Cultural, Group, and Interpersonal Processes*. New York: Psychology Press.

Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality, 15*, 425-448. doi: 10.1002/per.416

Petrides, K. V., Mikolajczak, M., Mavroveli, S., Sanchez-Ruiz, M.J., Furnham, A., & Pérez-González, J. C. (2016). Developments in trait emotional intelligence research. *Emotion Review, 8*(4), 335-341. doi: 10.1177/1754073916650493

Petrides, K. V. Pérez-González, J. C., & Furnham, A. (2007). On the criterion and incremental validity of trait emotional intelligence. *Cognition and Emotion, 21*(1), 26-55. doi 10.1080/02699930601038912

Picci, G., & Scherf, K. S. (2015) A two-hit model of autism: Adolescence as the second hit. *Clinical Psychological Science, 3*(3), 349-371. doi: 10.1177/2167702614540646

Poulou, M. (2014). How are trait emotional intelligence and social skills related to emotional and behavioural difficulties in adolescents?. *Educational Psychology, 34*(3), 354-366. doi: 10.1080/01443410.2013.785062

Public Health Agency of Canada. (2018). *Autism spectrum disorder among children and youth in Canada 2018: A report of the national autism spectrum disorder surveillance system*. Retrieved from https://www.canada.ca/content/dam/phac-aspc/documents/services/publications/diseases-conditions/autism-spectrum-disorder-children-youth-canada-2018/autism-spectrum-disorder-children-youth-canada-2018.pdf

Qualter, P., Whiteley, H. E., Hutchinson, J. M., & Pope, D. J. (2007). Supporting the development of emotional intelligence competencies to ease the transition from primary to high school, *Educational Psychology in Practice: Theory, Research, and Practice in Educational Psychology, 23*, 79-95. doi: 10.1080/02667360601154584

Qualter, P., Gardner, K. J., Pope, D. J., Hutchison, J. M., & Whiteley, H. E. (2012). Ability emotional intelligence, trait emotional intelligence, and academic success in British secondary schools: A 5 year longitudinal study. *Learning and Individual Differences, 22*(1), 83-91. doi: 10.1016/j.lindif.2011.11.007

Reynolds, C. R., & Kamphaus, R. W. (2004*). Behaviour Assessment System for Children, Second Edition Manual.* Circle Pines, MN: AGS Publishing.

Rieffe, C., Camodeca, M, Pouw, L. B. C., Lange, A. M. C., & Stockmann, L. (2012). Don't anger me! Bullying, victimization, and emotion dysregulation in young adolescents with ASD. *European Journal of Developmental Psychology, 9*(3), 351-370. doi: 10.1080/17405629.2012.680302

Rivers, S. E., Brackett, M. A., Reyes, M. R., Mayer, J. D., Caruso, D. R., Salovey, P. (2012). Measuring emotional intelligence in early adolescence with the MSCEIT-YV: Psychometric properties and relationship with academic performance and psychosocial functioning. *Journal of Psychoeducational Assessment, 30*(4), 344-366. doi: 10.1177/0734282912449443

Rivet, T. T., & Matson, M. L. (2011). Review of gender differences in core symptomatology in autism spectrum disorders. *Research in Autism Spectrum Disorder, 5*(3), 957-976. doi: 10.1016/j.rasd.2010.12.003

Roberts, R. D., Schultze, R., O'Brien, K., MacCann, C., Reid, J., & Maul, A. (2006). Exploring the validity of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) with established emotion measures. *Emotion, 6*(4), 663-669. doi: 10.1037/1528-3542.6.4.663

Rutter, M., Bailey, A., & Lord, C. (2003). *Manual for the Social Communication Questionnaire*. Los Angeles, CA: Western Psychological Services.

Ryland, H. K., Lundervold, A. J., Elgen, I., & Hysing, M. (2010). Is there a protective effect of normal to high intellectual function on mental health in children with chronic illness? *Child and Adolescent Psychiatry and Mental Health, 4*(3), 1-8. doi: 10.1186/1753-2000-4-3

Saklofske, D. H., Austin, E. J., Galloway, J., & Davidson, K. (2007). Individual differences correlates of health behaviours: Preliminary evidence for links between emotional

intelligence and coping. *Personality and Individual Differences, 42*(3), 491-502. doi: 10.1016/j.paid.2006.08.006

Saklofske, D. H., Austin, E. J., & Minski, P. S. (2003). Factor structure and validity of a trait emotional intelligence measure. *Personality and Individual Differences, 34*(4), 707-721. doi: 10.1016/S0191-8869(02)00056-9

Samson, A. C., Hardan, A. Y., Podell, R. W., Phillips, J. M., & Gross, J. J. (2015). Emotion regulation in children and adolescents with autism spectrum disorder. *Autism Research, 8*(1), 9-18. doi: 10.1002/aur.1387

Schanding, G. T., Nowell, K. P., & Goin-Kochel, R. P. (2012). Utility of the social communication questionnaire-current and social responsiveness scale as teacher-report screening tools for autism spectrum disorders. *Journal of Autism and Developmental Disorders, 42*, 1705-1716. doi: 10.1007/s10803-011-14112-9

Scheeren, A. M., Koot, H. M., & Begeer, S. (2012). Social interaction style of children and adolescents with high-functioning autism spectrum disorder. *Journal of Autism and Developmental Disorder, 42,* 2046-2055. doi: 10.1007/s10803-012-1451-x

Schutte, N. S., Malouff, J. M., Thorsteinsson, E. B., Bhullar, N., & Rooke, S. E. (2007). A meta-analytic investigation of the relationship between emotional intelligence and health. *Personality and Individual Differences, 42*(6), 921-933. doi: 10.1016/j.paid.2006.09.003

Seltzer, M. M., Krauss, M. W., Shattuck, P. T., Orsmond, G., Swe, A., & Lord, C. (2003). The symptoms of autism spectrum disorders in adolescence and adulthood. *Journal of Autism and Developmental Disorder, 33*(6), 565-581. Retrieved from https://deepblue.lib.umich.edu/bitstream/handle/2027.42/44621/10803_2004_Article_474978.pdf?sequence=1&isAllowed=y

Shalom, B. D., Mostofsky, R. L., Hazlett, M. C., Goldberg, R. J., Landa, Y., Faran, D. R.,…Hoehn-Saric, R. (2006). Normal physiological emotions but differences in expression of conscious feelings in children with high-functioning autism. *Journal of Autism and Developmental Disorders, 36*(3), 395-400. doi: 10.1007/s10803-006-0077-2

Sinzig, J., Walter, D., & Doepfner, M. (2009). Attention deficit/hyperactivity disorder in children and adolescents with autism spectrum disorder. *Journal of Attention Disorders, 13*(2), 117-126. doi: 10.1177/1087054708326261

Simonoff, E., Pickles, A., Charman, T., Chandler, S., Loucas, T., & Baird, G. (2008). Psychiatric disorder in children with autism spectrum disorders: Prevalence, comorbidity, and associated factors in a population-derived sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 47*(8), 921-929. doi: 10.1097/CHI.0b013e318179964f

Sowell, E. R., Thompson, P. M., Holmes, C. J., Jernigan, T. L., & Toga, A. W. (1999). In vivo evidence for post-adolescent brain maturation in frontal and striatal regions. *Nature Neuroscience, 2*(10), 859-861. Doi: 10.1038/13154

Stortelder, F., & Ploegmakers-Burg, M. (2010). Adolescence and the reorganization of infant development: A neuro-psychoanalytic model. *The Journal of the American Academy of Psychoanalysis and Dynamic Psychiatry, 38*(3), 503-531. doi: 10.1521/jaap.2010.38.3.503

Sutterlin, S., Paap, M. C. S., Babic, S., Kubler, A., Vogele, C. (2012). Rumination and age: Some things get better. *Journal of Aging Research,* 1-12. doi: 10.1155/2012/267327

Szatmari, P. (1999). Heterogeneity and the genetics of autism. *Journal of Psychiatry and Neuroscience, 24*(2), 159-165. Retrieved from

http://uml.idm.oclc.org/login?url=https://search-proquest-com.uml.idm.oclc.org/docview/619420484?accountid=14569

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics, Fifth Edition.* Boston, MA: Pearson Education, Inc.

Tsaousis, I., & Nikolaou, I. (2005). Exploring the relationship of emotional intelligence with physical and psychological health functioning. *Stress & Health, 21*(2), 77-86. doi: 10.1002/smi.1042

van der Linden, D., Pekaar, K. A., Bakker, A. B., Schermer, J. A., Vernon, P. A., Dunkel, C. S., & Petrides, K. V. (2017). Overlap between the general factor of personality and emotional intelligence: A meta-analysis. *Psychological Bulletin, 143*(1), 36-52. doi: 10.1037/bul0000078

Vickerstaff, S., Heriot, S., Wong, M., Lopes, A., & Dossetor, D. (2007). Intellectual ability, self-perceived social competence, and depressive symptomology in children with high-functioning autistic spectrum disorders. *Journal of Autism and Developmental Disorders, 37*, 1647-1664. doi: 10.1007/s10803-006-0292-x

Viguer, P., Cantero, M. J., & Bañuls, R. (2017). Enhancing emotional intelligence at school: Evaluation of the effectiveness of a two-year intervention program in Spanish pre-adolescents. *Personality and Individual Differences, 113,* 193-200.

Wechsler, D. (2011). *Wechsler abbreviated scale of intelligence – second edition*. San Antonio, TX: Pearson.

White, S. W., Oswald, D., Ollendick, T., & Scahill, L. (2009). Anxiety in children and adolescents with autism spectrum disorders. *Clinical Psychology Review, 29*(3), 216-229. doi: 10.1016/j.cpr.2009.01.003

White, S. W., Schry, A. R., & Maddox, B. B. (2012). Brief report: The assessment of anxiety in high-functioning adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorder, 42*(6), 1138-1145. doi: 10.1007/s10803-011-1353-3

Whitehouse, A. J. O., Durkin, K., Jaquet, E., & Ziatas, K. (2009). Friendship, loneliness, and depression in adolescents with asperger's syndrome. *Journal of Adolescence, 32*(2), 309-322. doi: 10.1016/j.adolescence.2008.03.004

Whitley, E., & Ball, J. (2002). Statistics review 6: Nonparametric methods. *Critical Care, 6,* 509-513. doi: 10.1186/cc1820

Wiggins, L. D., Bakeman, R., Adamson, L. B., & Robins, D. L. (2007). The utility of the social communication questionnaire in screening for autism in children referred for early intervention. *Focus on Autism and Other Developmental Disabilities, 22*(1), 33-38. doi: 10.1177/10883576070220010401

Williams, B. T., & Gray, K. M. (2013). Are emotion recognition skills related to autism symptom severity in children with autism? *International Journal of Developmental Disabilities, 59*(2), 118-133. doi; 10.1179/2047387713Y.0000000013

Williamson, S., Craig, J., & Slinger, R. (2008). Exploring the relationship between measures of self-esteem and psychological adjustment among adolescents with Asperger syndrome. *Autism: The International Journal of Research and Practice, 12*(4), 391-402. Retrieved from http://search.proquest.com.uml.idm.oclc.org/docvuew/61968262?accountid=14569

Wols, A., Scholte, R. H. J., & Qualter, P. (2015). Prospective associations between loneliness and emotional intelligence. *Journal of Adolescence, 39*, 40-48. doi: 10.1016/j.adolesence.2014.12.007

Zeidner, M., Matthews, G., & Roberts, R. D. (2012). *What we know about emotional intelligence: How it affects our learning, work, relationships, and mental health.* Cambridge, MA: MIT Press.

Appendix A

Participant Information Questionnaire

This questionnaire should be completed by a parent/legal guardian of the participant, as some questions pertain to early developmental history. If a parent/legal guardian is unavailable, a close relative who is knowledgeable about the participant's early history is acceptable.

To determine the appropriateness of your child's participation, the researchers require background information about your child. Please complete the following questionnaire.

Child's Full Name: _____

Gender (circle): Male Female

Child's date of birth: Month_____ Day_____ Year_____

Age: _____

Grade: _____

Official Diagnosis

What autism spectrum diagnosis has your child received? _____

Who originally diagnosed your child (name and title)?

_____

_____

How old was your child at the time of the original diagnosis? _____

Has anyone else given a diagnosis to your child? (Circle) Yes No

If yes, who gave the diagnosis (name and title)?

_____

_____

What was the diagnosis and how old was your child when they received the diagnosis?

Has your child been diagnosed with any other psychological disorders? (If yes, please explain).

Has your child been diagnosed with any medical disorders? (If yes, please explain, and indicate when they were diagnosed, and who gave the diagnosis, as well as their title)

_____

_____

_____

_____

Language Development

Did your child receive speech therapy before the age of 5? (If yes, please explain. For example, where they received services and how often they received services).

Approximately how old was your child when he/she began speaking in single words?

Approximately how old was your child when they began speaking in short but *meaningful phrases*?

Has your child ever experienced a head injury? (Circle) Yes No

If yes, were they unconscious? (Circle) Yes No

If yes, approximately how long were they unconscious? _____

Was your child hospitalized for their head injury? (Circle) Yes No

If yes, approximately how long was the hospitalization?_____

Has your child ever been diagnosed with selective mutism? (Circle) Yes No

Name of Person Completing this Form (Please print)

Relationship to Participant_____

Signature of Person Completing this Form

Date_____