



HHS Public Access

Author manuscript

J Child Adolesc Trauma. Author manuscript; available in PMC 2020 December 01.

Published in final edited form as:

J Child Adolesc Trauma. 2019 December ; 12(4): 529–547. doi:10.1007/s40653-019-00253-5.

Trauma and Autism Spectrum Disorder: Review, Proposed Treatment Adaptations and Future Directions

Jessica L. Peterson,

Seattle Children's Autism Center, jessica.peterson@seattlechildrens.org, 4909 25th Ave NE, Seattle, WA 98105, M/S CAC, PO Box 5371, Seattle, WA 98145-5005

Rachel Earl,

University of Washington, Psychiatry and Behavioral Sciences / Seattle Children's Hospital

Emily A. Fox,

Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA / Seattle Children's Hospital, M/S CAC PO Box 5371, 508.851.0996

Ruqian Ma,

University of Washington College of Education and Department of Psychiatry & Behavioral Sciences, CHDD Box 357920, Seattle, WA 98195, Phone: 206.616.8057

Ghina Haidar,

University of Washington College of Education & Department of Psychiatry and Behavioral Sciences, CHDD Box 357920, Seattle, WA 98195

Micah Pepper,

University of Washington Department of Psychiatry and Behavioral Sciences, CHDD Box 357920, Seattle, WA 98195, Phone: (206) 685-8770

Lucy Berliner,

University of Washington Medicine, Mailing Address: 325 Ninth Avenue, MS 359947 Seattle, WA 98104, 206 744-1600 (main line)

Arianne Wallace,

University of Washington Department of Psychiatry and Behavioral Sciences, CHDD Box 357920, Seattle, WA 98195, Phone: (206)616-1315

Raphael Bernier

Department of Psychiatry & Behavioral Sciences, University of Washington, Phone: 206-685-7585, rab2@uw.edu

Abstract

Correspondence regarding this manuscript should be addressed to: Raphael A. Bernier, Ph.D., Department of Psychiatry & Behavioral Sciences, University of Washington, Phone: 206-685-7585, rab2@uw.edu.

DISCLOSURES

All authors report no financial interests or potential conflicts of interest.

Publisher's Disclaimer: This Author Accepted Manuscript is a PDF file of a an unedited peer-reviewed manuscript that has been accepted for publication but has not been copyedited or corrected. The official version of record that is published in the journal is kept up to date and so may therefore differ from this version.

Empirical investigations of trauma and post-traumatic stress disorder (PTSD) in individuals with autism spectrum disorder (ASD) are lacking despite indications of increased risk for exposure to potentially traumatic events in this population. Research on the treatment of traumatic stress psychopathology in ASD is even more limited and suggests a critical need for guidance in the area of ASD-specific treatment adaptations. The current paper provides preliminary recommendations for adapting current evidenced-based, trauma-specific interventions, specifically trauma-focused cognitive behavioral therapy (TF-CBT), for individuals with ASD based on well-established and evidence-based practices for working with this population. These adaptations highlight the need to incorporate treatment goals related to ASD core symptoms and associated characteristics during treatment targeting traumatic stress symptoms. Future directions are discussed, including the development of instruments measuring trauma reactions in ASD, empirical investigations of modified trauma interventions for children with ASD to evaluate effectiveness, and collaboration between professionals specializing in ASD and trauma/PTSD to advance research and facilitate effective care for this community.

Keywords

Autism; Autism Spectrum; Trauma; Post-Traumatic Stress Disorder; Trauma Treatment

Introduction

Nearly two thirds of children and adolescents are exposed to at least one traumatic event prior to reaching adulthood, which elevates their risk for a broad array of challenges across the lifespan, including psychiatric disorders impacting mood, behavior, and development (Copeland, Keeler, Angold, & Costello, 2007). Moreover, as the number of adverse childhood experiences (ACEs) increases for a given individual, so does the magnitude of risk for subsequent medical, psychiatric, and socioeconomic challenges across the lifespan (Felitti et al., 1998). While the impact of trauma on individuals with anxiety and depressive disorders has been studied extensively, the experience of trauma in individuals with developmental disabilities, including Autism Spectrum Disorder (ASD), is less well known. This dearth of research stands contrary to data suggesting that those with developmental disabilities may have up to a three-fold increased risk of trauma exposure as compared to their typically developing peers (Hibbard & Desch, 2007; Reiter, Bryen, & Shacher, 2007). Understanding the effects of trauma in populations with developmental disabilities is especially important given the rising prevalence of ASD diagnoses and the increased need for therapeutic services for this population of children and adolescents. The mental health community requires a clearer understanding of the clinical manifestations of trauma in children and adolescents with ASD in order to inform appropriate adaptations of trauma-focused therapies that address the cognitive, communication, and behavioral challenges unique to ASD.

The aim of this review is to examine the existing literature regarding trauma in ASD and propose possible adaptations of trauma-specific interventions based on the unique attributes and features of ASD. First, an overview of the core deficits and associated features in ASD is provided to give context for how these characteristics may influence this population's

susceptibility to and experience of trauma. Then, research is reviewed in the area of trauma and ASD and the effectiveness of existing ASD specific modifications to treatment protocols addressing other presenting concerns such as anxiety for application to trauma interventions. Lastly, preliminary recommendations are presented for adapting current evidenced-based, trauma-specific interventions, specifically Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006) for youth with ASD and suggestions for future research in the area of trauma and ASD and directions in care.

Overview of Autism Spectrum Disorder (ASD)

Autism Spectrum Disorder (ASD) is a complex disorder of brain development characterized by social-communication impairments and restricted, repetitive patterns of behavior (American Psychiatric Association [APA], 2013). ASD is found in all racial, ethnic, and socioeconomic groups, and current data estimate the prevalence of ASD to be 1 in 59 children (Baio et al., 2018). Like other neurodevelopmental disorders, ASD occurs much more frequently in males (1 in 37) than in females (1 in 151) (Baio et al., 2018; Jacquemont et al., 2014; Levy et al., 2011; Newschaffer et al., 2007). An accurate diagnosis of ASD can be made by experienced, highly trained clinicians before 2 years of age (Guthrie, Swineford, Nottke, & Wetherby, 2013). Routine screening for ASD at 18- and 24-month well child visits is recommended by The American Academy of Pediatrics (Myers & Johnson, 2007) based on robust evidence demonstrating the importance of early detection and evidenced based intervention for improved outcomes (Dawson et al., 2010). However, most children do not receive a diagnosis until at least the age of 4, with children from underserved communities and racial/ethnic minority groups diagnosed at even older ages (Christensen et al., 2016b; Mandell, Listerud, Levy, & Pinto-Martin, 2002; Valicenti-McDermott, Hottinger, Seijo, & Shulman, 2012; Yeargin-Allsopp et al., 2003).

ASD is a heterogeneous disorder, both etiologically and in terms of clinical presentation, and individuals with ASD demonstrate a wide spectrum of abilities and challenges. While the etiology of ASD is complex and still remains largely unknown, this condition is likely the result of the interactive effects of genetic and environmental risk factors (Lai, Lombardo, & Baron-Cohen, 2014; Schaefer, 2016; Tchaconas & Adesman, 2013). ASD is a highly heritable neurodevelopmental disorder, with a high concordance rate among monozygotic twins (Bailey et al., 1995) and an increased risk of sibling recurrence (Ozonoff et al., 2011; Risch et al., 2014). ASD is largely not a single-gene disorder. Rather, there are likely hundreds of genes that contribute to its etiology (Gilman et al., 2011; Levy et al., 2011). A number of environmental factors, particularly during the prenatal period, also present an increased risk for ASD including maternal diabetes, infection, fever, and inflammation (Ornoy, Weinstein-Fudim, & Ergaz, 2015); maternal asthma and allergies (Croen, Grether, Yoshida, Odouli, & Van de Water, 2005); the use of certain drugs during pregnancy (Croen, Grether, Yoshida, Odouli, & Hendrick, 2011; Gidaya et al., 2016;), extreme prematurity (Johnson et al., 2010), and maternal exposure to air pollution (Raz et al., 2015; Volk, Lurmann, Penfold, Hertz-Picciotto, & McConnell, 2013). Advanced parental age (Idring et al., 2014) has also been associated with an increased risk of ASD.

Core ASD Impairments and Associated Features to Consider in Trauma Treatment

Social-Communication

ASD is characterized by persistent deficits in social communication and social interaction that are evident across a variety of contexts (APA, 2013). The presentation of social-communication impairments in individuals with ASD is heterogeneous and often varies by age and level of cognitive ability. While speech delays are common and approximately 25-35% of those with ASD are considered to be minimally verbal (Rose, Trembath, Keen, & Paynter, 2016), higher functioning individuals with ASD may exhibit age-appropriate or even advanced communication abilities. Even when expressive language skills are intact, however, individuals with ASD often struggle with important social-communication skills, including effective communication of emotions and experiences, participation in reciprocal conversation, and accurate interpretation of figurative language (e.g., idioms, metaphors), contextual cues in conversation, and nonverbal cues in communication with others such as body language, subtle intent, and intonation (Howlin, 2003; Kim, Paul, & Tager-Flusberg, 2014; Klin, McPartland, & Volkmar, 2005; Livanis, Almodovar, & Skolnik, 2017; Volden, Coolican, Garon, White, & Bryson, 2009). Language may be idiosyncratic in individuals with ASD, including the use of stereotyped language and unusual prosody characterized by abnormalities in volume, pitch, tone, and/or rhythm of speech (Boucher, 2012; Matson, 2016). To meet DSM-5 diagnostic criteria for ASD, individuals need to display impairments in social-emotional reciprocity, such as reduced sharing of interests and emotions, offering to share, offering comfort to others, and/or initiating and responding to social interactions. Nonverbal communicative behaviors are impaired in ASD, ranging from poor integration of verbal and nonverbal behavior, abnormalities in eye contact, use of facial expression and body language, as well as difficulties interpreting or understanding the nonverbal communication of others. Lastly, individuals with ASD show marked deficits in social relationships characterized by symptoms such as social disinhibition, lack of social motivation, and failure to establish friendships appropriate for developmental level (APA, 2013; Kasari & Rotheram-Fuller, 2007).

Social Cognition and Theory of Mind

Individuals with ASD also present with deficits in theory of mind (ToM), (Baron-Cohen, Leslie, & Frith, 1985; Tager-Flusberg, 2007), an aspect of social cognition that is described as the ability to identify and understand the thoughts, feelings, and intentions of others (Premack & Woodruff, 1978). The presence of ToM deficits in ASD is supported by a robust field of research detailing impaired performance on laboratory-based ToM tasks and atypical neural processing in regions associated with ToM in individuals with ASD (Kana et al., 2015; White, Frith, Rellecke, Al-Noor, & Gilbert, 2014; Wimmer & Perner, 1983). ToM deficits cause social challenges such as difficulties predicting and understanding the emotional states, behaviors, and perspectives of others; inferring the motivations/intentions behind another person's behavior or actions; and differentiating fiction from fact (Frith & Frith, 2006; Myles & Southwick, 1999).

Emotion Recognition, Processing, and Expression

In conjunction with the ToM deficits noted above, individuals with ASD present with marked impairments in emotion recognition and processing. Studies show individuals with ASD display deficits in facial recognition, specifically a tendency to orient to non-social rather than social stimuli from an early age, even by their first birthday (Dawson et al., 1998; Dawson et al., 2002a; Osterling & Dawson, 1994). Such differences in attention are found to persist throughout the lifespan (Boucher, Lewis, & Collis, 1998; Klin et al., 1999; Ozonoff, Pennington, & Rogers, 1990). A persistent lack of attention to faces is believed to result in downstream impairments in the recognition of facial expressions and emotions in others, a key component of nonverbal communication and of successful social interactions (Baron-Cohen et al., 2001; Black et al., 2017; Klin et al., 2002; Williams & Gray, 2013).

In addition to difficulties recognizing emotions in others, individuals with ASD often struggle to identify emotions within themselves and the contextual and physiological cues that facilitate emotional awareness (Hill, Berthoz, & Frith, 2004; Rieffe, Terwogt, & Kotronopoulou, 2007; Shalom et al., 2006). Rates of alexithymia, a subclinical condition characterized by difficulties in identifying, describing, and expressing one's own emotional state (Nemiah, Freyberger, & Sifneos 1976), are elevated in this population (Bird & Cook, 2013; Foulkes, Bird, Gokcen, McCrory, & Viding, 2015) and may underlie impairments in emotion recognition and empathy (Bird et al., 2010; Cook, Brewer, Shah, & Bird, 2013; Silani et al., 2008). Core diagnostic features of ASD, such as restricted range of affect and limited nonverbal modes of communication, further alter this population's expression of emotions and stress responses compared to the typically developing population (APA, 2013).

Restricted and Repetitive Behaviors

Restricted interests and repetitive behavior (RRB) patterns describe the second symptom domain required for a diagnosis of ASD (APA, 2013). Importantly, presentation of and severity of RRBs differ for each individual with autism. Many individuals with ASD present with sensory processing differences, including sensory-seeking behaviors and sensory aversions (Kern et al., 2006; Rogers, Hepburn, & Wehner, 2003; Watling et al., 2001). For example, an individual with ASD may experience heightened sensitivity to touch, and therefore become distressed at another's touch, experiencing that input as more painful than others would expect. Sensory processing differences can also include over- or under-sensitivity to pain, which may alter the amount of distress (and help-seeking behaviors) an individual with ASD expresses across situations (Gilbert-MacLeod, Craig, Rocha, & Mathias, 2000).

Another common repetitive behavioral feature of ASD is insistence on sameness, or difficulty with changes in routine (Bishop et al., 2013; Rodgers, Glod, Connolly, & McConachie, 2012). Minor changes to routine may be perceived as highly distressing for an individual with ASD, such that even a slight change of schedule (e.g., parent arriving a few minutes late to pick them up or having a substitute teacher one day) might result in heightened levels of anxiety. Alongside behavioral rigidity, many individuals with ASD engage in repetitive behaviors including repetitive use of objects (e.g., lining or sorting toys) or motor mannerisms (e.g., hand flapping, toe walking, jumping), the expression of which

may vary with level of functioning (Bishop, Richler, & Lord, 2006; South, Ozonoff, & McMahon, 2005).

An additional characteristic behavior of ASD is the presence of fixated or circumscribed interests that are unusual in their intensity and/or subject matter (Boyd et al., 2007; Sasson et al., 2011). These interests are preoccupying and disrupt social rapport and family life due to the excessive amounts of time spent engaging in activities or discussion related to the interest. Within this cluster, interests can seem unusual (e.g., street lights, toilets, brands of elevator manufacturers) or age-appropriate (e.g., popular television shows, movie characters) but unusually intense. In addition, many individuals with autism have a tendency toward perseveration on certain topics or events that may change over time. To meet DSM-5 criteria for ASD, an individual must present with at least two of the four above mentioned clusters of restricted or repetitive interests or behaviors (APA, 2013).

Cognitive and Learning Features

In addition to the core diagnostic criteria for autism, commonly associated features and challenges in the areas of cognition and learning have been identified and are likely to impact how individuals with ASD interpret and experience the world around them. Up to 68% of individuals with ASD are also diagnosed with intellectual disability (ID) (IQ < 70), making intellectual functioning an important area of consideration when determining appropriate treatments for those with ASD (Baio et al., 2018; Mandell et al., 2012; Yeargin-Allsopp et al., 2003). ASD is associated with differences in information processing; specifically, many individuals with ASD show impairments in global processing (see Happé & Booth, 2008, for review). While most people have a natural tendency to process information globally, in context and for meaning (termed central coherence), many individuals with ASD display a more detailed, piecemeal processing style. This local processing bias (vs. global processing bias) can be advantageous in some situations (e.g., remembering details) but also detrimental in others.

Individuals with ASD tend to have difficulties with abstract reasoning, the ability to identify and formulate patterns and concepts based on representational or abstract criteria. On a basic level, studies have found that lower-functioning individuals with ASD struggle with sorting tasks when the organizing feature is an abstract concept (Ropar & Peebles, 2007; Shulman et al., 1995). While higher-functioning individuals with ASD may not struggle with these types of basic sorting tasks, abstract reasoning impairments emerge in situations requiring the development and organization of schemas about social and non-social information, and by extension, social problem-solving (Minshew, Meyer, & Goldstein, 2002; Solomon, Bauminger, & Rogers, 2011).

A robust field of research supports the presence of executive-functioning deficits in ASD across ages and levels of functioning, particularly in the areas of planning and cognitive flexibility, which refers to the ability to shift flexibly between thoughts and actions in response to environmental changes (Hill, 2004; Pennington & Ozonoff, 1996). Closely related to executive-functioning skills, memory abnormalities have also been widely observed in ASD, specifically autobiographical memory impairments in both adults and children with ASD. A recent study of children with ASD found reduced retrieval of semantic

personality traits, an increase in the number of prompts needed to facilitate episodic memory recall, and fewer episodic memories containing emotional and sensory information (Boucher, Mayes, & Bigham, 2012; Cooper et al., 2017; Meyer, Gardiner, & Bowler., 2014). During memory retrieval tasks, adults with ASD have been shown to be more likely to take an observer (third-person) perspective suggesting a reduced tendency to re-experience past events from their own point of view (Lind & Bowler, 2010). The causal process underlying autobiographical memory deficits remains unclear, but there is some evidence these challenges are related to deficits in elaborative encoding in which material is extended upon by creating associative links with prior knowledge (Meyer, Gardiner, & Bowler, 2014; Toichi & Kamio, 2003). Lastly, many individuals with ASD exhibit learning challenges including difficulties generalizing information and skills across contexts, limited capacity in learning new information, and processing speed deficits (Christensen et al., 2016a; Schopler & Mesibov, 2013).

Comorbid Conditions and Challenging Behaviors

A myriad of comorbid health conditions are common in ASD including seizures (Bolton et al., 2011; Mandell et al., 2012; Tuchman & Rapin, 2002), gastrointestinal issues (Buie et al., 2010; McElhanon, McCracken, Karpen, & Sharp, 2014), and sleep disturbances (Polimeni, Richdale, & Francis, 2005; Richdale & Schreck, 2009; Souders et al., 2009). Psychiatric comorbidity in individuals with ASD is frequent, particularly as age increases (Kohane et al., 2012; Simonoff et al., 2008). Epidemiological studies indicate the majority of individuals with ASD present with at least one additional DSM-5 diagnosis (Buck et al., 2014; de Bruin, Ferdinand, Meester, de Nijs, & Verheij, 2007; Leyfer et al., 2006; Mattila et al., 2010; Simonoff et al., 2008), the most common co-occurring conditions being anxiety disorders (Steensel, ögels, & Perrin, 2011), mood disorders, and attentional problems and ADHD (Joshi et al., 2013; Levy, Mandell, & Schultz, 2009; Leyfer et al., 2006). Other common challenging behaviors include emotional lability, tantrums, aggression, self-injurious behavior, wandering, and elopement (Anderson et al., 2012; Kanne & Mazurek, 2011; Lecavalier, 2006; Stadnick, Chlebowski, & Brookman-Fraze, 2017).

ASD-Related Strengths

While the overview of ASD thus far has focused on specific areas of challenge, it is important to highlight the many strengths that are often observed in this population, which may also influence perception and experience of trauma, and from which to capitalize on in treatment. Interestingly, despite impairments in abstract reasoning, many individuals with ASD show typically-developed or even advanced abilities in “lower level” visual-spatial processing, including concrete visual patterns and object details (Hayashi, Kato, Igarashi, & Kashima, 2008; Kumar, 2013; Soulierès et al., 2009). Individuals with ASD are often visual learners, meaning they understand or retain what they see more effectively than what they hear (Tissot & Evans, 2003). Additionally, while autobiographical memory challenges are common in ASD, strengths in rote memory are frequently cited in this population (Bennetto, Pennington, & Rogers, 1996; Meilleur, Jelenic, & Mottron, 2015). Some individuals with ASD can remember large chunks of information with limited presentation of stimuli, like conversations from movies and words from a song they have heard on a single occasion (Heaton & Wallace, 2004). Exceptional recall and attention to details are also observed in

many individuals with ASD relative to the general population, given the tendency for a local processing bias in this population (Happé & Frith, 2006). Lastly, about 10% of individuals with ASD show exceptional or “savant” abilities in areas such as math, music, memory puzzles, art, or other specific areas (Howlin, 2012; Rimland, 1978).

Definition of Trauma

Given how little is known about the experiences of traumatic stress in those with ASD, trauma is defined broadly in this paper. A “traumatic event” is understood as an event that is experienced as threatening to an individual and that has immediate and/or prolonged effects on an individual’s functioning in their environment and relationships (Kerns et al., 2015). Importantly, individuals can have differing perceptions of and reactions to the same event, which may result in one individual experiencing the event as traumatic but not the other. While *post-traumatic stress disorder* (PTSD) symptoms are commonly-used inclusion criteria or rubric for trauma assessment in research studies, not all individuals experiencing traumatic stress will meet full criteria for the disorder (APA, 2013). Such variability in trauma symptom presentation is likely compounded in cases of ASD. Thus, this paper’s exploration of trauma experiences and relevant therapeutic practices for children and adolescents with ASD will reference a wide range of traumatic stress responses, including presentations that are and are not fully diagnosable as PTSD.

ASD and Trauma

Research on ASD and trauma is in its infancy in terms of understanding the prevalence of traumatic stress and PTSD in this population and the effects of potentially traumatic events on individuals with ASD. It has been suggested individuals with ASD may be more susceptible to traumatic stress reactions due to difficulties with language comprehension, information processing, emotion regulation deficits, and an increased rate of social isolation (Brenner, Pan, Mazefsky, Smith, & Gabriels, 2017; Kerns et al., 2015; Mansell et al., 1998). Alternatively, it has been proposed that individuals with ASD may be less susceptible to traumatic stress symptoms due to differences in social perception, awareness, and difficulties describing emotional experiences, which result in limited abilities to accurately interpret and perceive an event as traumatic (Brenner, Pan, Mazefsky, Smith, & Gabriels, 2017; Kerns et al., 2015; Mansell et al., 1998; Mehtar & Mukaddes, 2011). The possibility also remains that individuals with ASD possess a similar level of traumatic stress susceptibility as typically developing individuals (Cook et al., 1993; King & Desaulnier, 2011; Mansell et al., 1998). There is currently a scarcity of research to evaluate these hypotheses, and prevalence estimates of trauma and PTSD in the ASD population remain largely unknown. To date, only a handful of studies have measured the full PTSD syndrome including exposure, re-experiencing, alterations in cognition and mood, and arousal in this population (Brenner et al., 2017; Bruin et al., 2007; Mehtar & Mukaddes, 2011; Storch et al., 2013). Rates of individuals meeting full criteria for PTSD in these studies ranged from 0% to approximately 17% with wide variation in ascertainment, sample size, history of trauma exposure, and assessment measures and methods. Multiple barriers to the identification of trauma symptoms in ASD exist including diagnostic overshadowing (Reiss, Levitan, & Szyszko, 1982), comorbid conditions in ASD such as anxiety that may obscure presentation, overlap

in ASD and PTSD diagnostic criteria (APA, 2013), and empirical findings indicating the presence of ASD symptoms and traits in children with an early history of abuse or neglect (Green, Leadbitter, Kay, & Sharma, 2016; Rutter et al., 1999). Finally, there is also a lack of well-validated self-report measures that are appropriate and sensitive enough to evaluate trauma reactions and experiences of children and adolescents with ASD.

Prevalence and Risk of Trauma

ASD core deficits and associated features likely increase the risk of encountering potentially traumatic events for a multitude of reasons. In general, children and adolescents with developmental disabilities are more vulnerable to becoming victims of maltreatment due to deficits in communication skills, cognitive and physical disabilities, and inherent difficulties in social interactions (Sullivan & Knutson, 2000). Indeed, elevated rates of maltreatment have been found in ASD youth in community settings (above 30%) relative to the general population (Mandell et al., 2005). Limited verbal and cognitive abilities may impact an individual's ability to report a traumatic event or episodes of abuse. Additionally, challenging behaviors frequently observed in this population such as tantrums, aggression, repetitive behaviors may increase the chance of abuse and maltreatment by caregivers (Stitch et al., 2009). ASD-associated deficits in social cognition, characterized by social naivete, lack of social boundaries, and inability to detect a violation of social rules and inappropriate behavior, create an increased vulnerability to interpersonal manipulation and victimization. A reduced ability to interpret the nonverbal cues of others could put individuals with ASD at risk of misunderstanding potentially malicious intents of others. Indeed, significantly higher rates of bullying have been cited in children with ASD relative to typically developing children as well as children with other developmental disabilities (Hong, Neely, & Lund, 2015; Sterzing, Shattuck, Narendorf, Wagner, & Cooper, 2012). In addition, research suggests individuals with ASD are more likely to experience serious physical injuries and extended psychiatric hospitalizations (Coren et al., 2006; McDermott, Zhou, & Mann, 2008).

Perception and Experience of Trauma

Research also suggests ASD-related factors may increase the risk for the development of trauma-related psychopathology in response to aversive events. Neurobiological predispositions associated with ASD indicate stressors may have a greater impact on this population. Specifically, investigations examining LHPA functioning in ASD, an important neuroendocrine system in responding to stress or threat, have frequently cited increased cortisol levels in response to stressful stimuli in this population (Corbett, Mendoza, Wegelin, Carmean, & Levine, 2008; Corbett et al., 2010). Spratt and colleagues (2012) provided further evidence for dysregulation of the LHPA system in individuals with ASD, manifested by increased magnitude of cortisol response and a prolonged duration of recovery to basal activity in reaction to a stressor. Similarly, Corbett and colleagues (2010) found children with ASD demonstrate higher stress responsivity, indicated by elevated cortisol levels during play, suggesting children with ASD may find social interaction to be stress provoking. Evidence from neurophysiological studies supporting emotion processing and regulation deficits in ASD is robust (Bernier et al., 2007, 2013; Dawson et al., 2004a; Dawson, Webb, & McPartland, 2005; Hileman et al., 2011; McPartland, Dawson, Webb, Panagiotides, &

Carver, 2004; Pelphrey et al., 2007; Webb et al., 2017). These neurobiological vulnerabilities to arousal and emotion dysregulation may represent a pathway for experiencing traumatic stress (Kerns, Newschaffer, & Berkowitz, 2015; White et al., 2014; Yehuda, 2001). Further, aspects of cognitive processes associated with ASD, such as repetitive, perseverative tendencies, could contribute to the experience of trauma. That is, if an event is particularly salient and perhaps distressing, such as a traumatic event, individuals with ASD may perseverate on thoughts and feelings related to the circumstance, putting them at risk of re-experiencing their past trauma over and over. Lastly, it has been proposed that ASD core symptoms lead to chronic exposure to daily ASD-related stressors stemming from sensory sensitivities and aversions, prevention or punishment of restricted and repetitive behaviors, social interaction difficulties such as peer rejection, social confusion, and stigmatization, which may lead to clinical levels of anxiety (Kerns et al., 2015; Wood & Gadow, 2010).

Presentation of Traumatic Stress Symptomatology

Finally, an important question remains whether individuals with ASD manifest traumatic symptomology and/or PTSD similarly to individuals without ASD or exhibit distinct traumatic stress symptom profiles. For example, disturbances in arousal and reactivity (e.g., aggressive behavior, self-destructive behavior, concentration problems) and sleep difficulties consistent with PTSD diagnostic criteria, are also common in individuals with ASD as noted above. Therefore, trauma-related symptoms may represent exacerbation or changes in existing symptoms in individuals with ASD.

Brenner and colleagues (2017) examined the behavioral manifestations of trauma due to abuse in a large sample of children with ASD in inpatient settings. Youth with ASD and a history of abuse evidenced more intrusive thoughts, distressing memories, loss of interest, and lethargy relative to a comparison group of individuals with ASD but no reported history of abuse. There were no differences, however, between these two groups in the areas of temper tantrums, irritability, attention problems, and sleep problems, which the authors interpreted as likely due to the high incidence of these symptoms in ASD generally. Other investigations have evaluated the psychological response of individuals with ASD to other types of traumatic experiences, namely natural disasters. Valenti and colleagues (2012) found that youth with ASD exposed to an earthquake showed declines in adaptive functioning skills at six- and twelve-month follow-up compared to a matched sample of individuals with ASD who had not experienced the same potentially traumatic event. Recent empirical work has also suggested individuals with ASD may be more sensitive to traumatic experience in terms of symptom severity, including research showing strong associations between severity of abuse and depression symptoms in a group of individuals with ASD but not a comparison group of individuals with significant abuse histories without ASD (Walters et al., 2013). In a sample of youth with ASD and anxiety disorder, individuals that also had a comorbid diagnosis of PTSD presented with an increased propensity of suicidal thoughts (Storch et al., 2013). Mehtar and Mukaddes (2011) evaluated types of trauma, prevalence, and symptom presentation, including PTSD diagnosis, in a large sample of children with ASD. Findings showed approximately 26% of cases had a history of trauma, and, of those subjects, approximately 67% met full criteria for PTSD.. The authors provided a promising avenue for assessment by using a semi-structured, retrospective interview with parents

termed the Trauma Symptom Investigation Form in ASD, to measure functional and adaptive abilities in association with trauma. Exploring the clinical characteristics of PTSD in this sample, the investigation found trauma exposure in youth with ASD was associated with the development of new behavioral difficulties (e.g., aggression, self-injury, agitation), increased stereotypies, worsening social-communication impairments, increased distractibility/hyperactivity, alterations in sleep and appetite, and decline in self-help skills. In summary, limited empirical data exists about the true prevalence, experience of trauma, and presentation of traumatic stress/PTSD in individuals with ASD although extant studies support an increased risk of exposure to potentially traumatic events and provide some information on possible traumatic stress indicators and symptom presentation in this population. Research on the treatment of traumatic stress symptoms in individuals with ASD is even more limited. Empirically supported treatments for symptom management in the neurotypical population do not automatically translate to effective treatment with individuals with ASD. There is a critical need to develop and evaluate potential adaptations to existing evidenced-based trauma treatment protocols for the ASD community.

Trauma-Focused Cognitive Behavior Therapy and Adaptations

Given that Trauma Focused-Cognitive Behavioral Therapy (TF-CBT, Cohen, Mannarino, & Deblinger, 2006) is the most supported treatment for the impact of trauma in children (Scheeringa, Weems, Cohen, Amaya-Jackson, & Guthrie, 2011) and applications have been developed for various populations (Cohen, Mannarino, & Deblinger, 2017), ASD-sensitive applications of TF-CBT could be an effective treatment for the management of trauma in ASD. Case reports and intervention studies suggest applications of TF-CBT for very young children and for individuals with ID can be used to address trauma symptoms in these populations (Cohen, Mannarino, & Deblinger, 2012; Mevissen-Renckens & de Jongh, 2010; Kroese & Thomas, 2006). Given the presence of cognitive and language based impairments in ASD, modifications to TF-CBT protocols developed for younger children and individuals with ID may provide guidance in adapting interventions for an ASD population. Several studies provide evidence of the effectiveness of adapted TF-CBT for reducing trauma related symptoms in preschool aged children and (Cohen & Mannarino, 1996; Cohen & Mannarino, 1998; De Arellano et al., 2014; Sheeringa, 2011) and emphasize the importance of caregiver involvement to address externalizing behaviors and to strengthen caregiver-child relationships through parent management training and problem solving. Based on previous studies showing the effectiveness of CBT techniques for younger children (Cohen & Mannarino, 1996; March et al., 1998), the Preschool PTSD Treatment manual (PPT; Scheeringa et al., 2007) was developed for children ages 3-6 with specific modifications for this population. These modifications included altering verbal discussions in the TF-CBT manual to be more concrete and/or replaced with art/drawing activities, utilization of cartoons to aide in symptom identification, increased use of drawing exercises, and reduction in the number of distressing reminders required for the stimulus exposure hierarchy. In addition, certain elements were excluded given the limitations of young children's verbal and abstract reasoning abilities, such as the use of positive self-talk as a cognitive relaxation exercise and discussions aimed at reconstructing cognitive perceptions of the world and planning coping responses for the future. Caregivers are involved in each

session outlined in the PPT manual and sections are included to address behavior management and healthy child-caregiver attachment. The PPT approach also takes steps to address systemic barriers to treatment that are often experienced by victims of trauma, such as assisting with transportation and acknowledging how the child's traumatic experiences may impact any history of trauma present for the child's caregivers.

Like individuals with ASD, individuals with ID may be at an increased risk for adverse experiences and trauma (Hatton & Emerson, 2004; Wigham, Hatton, & Taylor, 2011). Small case study reports demonstrate that modified versions of CBT-based interventions may be associated with reduced trauma symptoms in this population. Specifically, Kroese & Thomas (2006) described the use of a modified version of Imagery Rehearsal Therapy (IRT) to treat chronic nightmares in two adult female patients with ID who had been sexually assaulted. IRT, a CBT-based approach that is often used to treat nightmares, involves making changes to nightmares while awake and then using imagery exercises to practice the revised version of the dream (Krakow et al., 2001). Kroese & Thomas (2006), in working with clients with ID, employed visuals to support the clients' description of both the original nightmare and its revised version. Instead of recording the dream in writing, each scene of the clients' nightmares was drawn as a picture. Therapists and clients then worked together to make positive changes to the dream, and those changes were illustrated in a new series of pictures. Common CBT techniques were used throughout the IRT process, including cognitive restructuring, exposure, homework, and relaxation. Clients were asked to practice the new dream sequence at home nightly before bed. With the use of IRT, both clients reported the cessation of their nightmares, with treatment gains maintained at 6 months of follow-up (Kroese & Thomas, 2006). Lemmon & Mizes (2002) used a modified version of exposure therapy to treat PTSD symptoms in a woman with ID who had been the victim of sexual abuse. Two of the primary modifications employed were the use of a metaphor to describe treatment rationale (i.e., distressing memories as "undigested food sitting in her stomach, making her sick"), and the use of a substantially smaller SUDS scale (i.e., 1-10 instead of 0-100) (Lemmon & Mizes, 2002). Upon termination of treatment after 25 sessions, the client was observed to be calm in response to exposure to trauma stimuli, and demonstrated a reduction in both outbursts and hypervigilance (Lemmon & Mizes, 2002).

Adaptations for Children with ASD to CBT Addressing Other Psychiatric Concerns

Adaptations of CBT protocols for individuals with ASD have shown efficacy in addressing a range of comorbid psychiatric concerns, most frequently anxiety (Chalfant, Rapee, & Carroll, 2007; McNally Keehn, Lincoln, Brown, & Chavira, 2013; Sung et al., 2011; Wood et al., 2015), disruptive behaviors (Sofronoff, Attwood, Hinton, & Levin, 2007), and impairments in social functioning (Bauminger, 2002, 2007a, 2007b; Beaumont & Sofronoff, 2008; Koning, Magill-Evans, Volden, & Dick, 2013). These ASD-specific modifications may inform applications of trauma-focused interventions for this population. Generally, these treatments involve modifications of evidenced-based CBT manualized treatments for typically-developing youth with a focus on both co-occurring emotional and behavioral problems, as well as on core ASD impairments (e.g., social communication) and difficulties with daily functioning. The largest body of research exists for evaluations of CBT based anxiety treatment in youth with ASD (see Denial & Wood, 2013 for review). Anxiety treatment adaptations based on the unique needs, learning style, and motivational

considerations specific to children with ASD have included modifications such as extensive use of visual stimuli, increased therapeutic structure, use of motivating metaphors (e.g., related to circumscribed interests) and social stories to target social skills deficits (Sofronoff et al., 2005; Sung et al., 2011), incorporation of a social skills module, use of handheld devices (e.g., iPod touch) to help individuals monitor emotional arousal and to provide scaffolding regarding use of coping strategies, and an increased number of exposures. A modified version of the Coping Cat program, an established CBT program for neurotypical youth with anxiety, has been associated with a significant reduction in anxiety symptoms post-treatment in youth (8-14 years) with ASD; specifically, 58% of CBT participants no longer met criteria for a primary anxiety diagnosis, compared with 100% of waitlist participants who continued to meet criteria (McNally Keehn et al., 2013). ASD-specific modifications to this treatment program included increased length of sessions from 60 to 90 minutes, extensive use of visual materials, incorporation of participants' restricted interests, sensory breaks, review of content and assigned homework with parents immediately following child sessions, and individualized emphasis of techniques and rewards.

The greatest empirical support found for a CBT protocol for anxiety treatment in youth with ASD is the Behavioral Interventions for Anxiety in Children with Autism (BIACA) program, which was evaluated using three separate randomized controlled trials and deemed an efficacious treatment (Wood et al., 2009; Wood et al., 2015). During the BIACA clinical trials, participants were involved in developing motivating metaphors and visual stimuli based on circumscribed interests (e.g., character using thought bubbles, engaging in brave behavior), which were then utilized throughout treatment. In addition, a strong focus was placed on addressing social skills and adaptive functioning deficits that may undermine treatment gains or interfere with participants' engagement in the program. The BIACA program included heavy parent involvement with concurrent sessions in which parents were provided with psychoeducation related to helping their child deal with anxiety as well as basic behavior-management skills. School collaboration in the form of teacher consultations and involvement in participants' school-specific goals and exposures was also used to promote generalization and to support skill development in community settings. These findings provide strong initial support for the effectiveness of modified CBT programs to address common psychiatric concerns in youth with ASD and guide attempts to modify existing evidence-based treatments (EBTs) for other presenting concerns such as traumatic stress and PTSD.

Proposed Adaptations to Trauma-Focused Interventions for Youth with ASD

The following section first outlines general treatment strategies to address core deficits and behaviors associated with ASD that are relevant for any CBT-based approach. Second, specific adaptations to TF-CBT are discussed that may be helpful for individuals with ASD. These potential adaptations are informed by the clinical characteristics of ASD, ASD-specific adaptations of evidence-based CBT treatments for other comorbid conditions, and TF-CBT applications for younger typically developing children and individuals with ID. Given the significant heterogeneity in symptom presentation in individuals with ASD, flexibility is essential when working therapeutically with this population and the

implementation of any intervention should be based on an individual’s profile of unique strengths and challenges.

General Treatment Strategies

Modified CBT programs to address trauma symptoms in individuals with ASD should consider core ASD impairments, as well as challenges in adaptive functioning. For some clients, ASD behaviors may be the primary concern, whereas for others, their most pressing concern for treatment could be associated with daily living skills (e.g., personal hygiene) or a comorbid condition or symptoms such as aggression, anxiety, PTSD, ADHD, or depression. Identifying clients’ most salient intervention need will be important for informing treatment planning. Treatment for comorbid emotional or behavioral concerns in ASD should incorporate well- established, evidence-based practice for working effectively with individuals with ASD in general. For example, utilization of visual supports such as timers and visual activity schedules (VAS; Knight, Sartini, & Spriggs, 2015); encouraging clients to use rote memory for learning usual information (e.g., repetition, practice of skills), social stories or narratives (Delano & Snell, 2006); social modeling; task analysis, in which a particular skill or behavior is taught by breaking it down into smaller steps (Anderson, Taras, & Cannon, 1996; Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984; Parker & Kramps, 2011); and individualized reinforcement, which incorporates a preferred activity or item as a reward for demonstrating a particular behavior. Given the difficulties with learning and generalization outlined above, teaching and practice should occur across contexts and providers including teachers, clinicians, and caregivers to maximize skill-building. As an evidenced-based approach for skill-building for individuals with ASD, applied behavior analysis techniques such as individualized reinforcements, stimulus control, and chaining will likely be helpful in treatment with this population. Based on evidenced-based therapeutic approaches for working with individuals with ASD (See Wong et al., 2015 for review) and existing modified CBT programs for this population (See Danial & Wood, 2013 for review), specific strategies to address core deficits and other behaviors associated with ASD in treatment are highlighted in the tables below. The suggestions may not be appropriate for all clients with ASD given the heterogeneity inherent in this condition, but it will likely be helpful for clinicians to consider this information during treatment planning.

Considerations for ASD Specific Treatment Modifications: Suggestions for ASD Specific TF-CBT adaptations. Systematic empirical evaluation of these proposed adaptations is needed to assess efficacy.	
Communication Strategies	
●	<p>Provide clear, simple instructions:</p> <ul style="list-style-type: none"> • Use fewer words. • Provide longer wait time processing time during communication. • “First, then...” instructions (e.g., “First we finish this worksheet, then you can play with the iPad”) may be a helpful communication structure.
●	Utilize caregivers and other providers (e.g., speech language therapist, behavioral analyst) to acquire information regarding the most effective communication strategies for a specific client.

Considerations for ASD Specific Treatment Modifications: Suggestions for ASD Specific TF-CBT adaptations. Systematic empirical evaluation of these proposed adaptations is needed to assess efficacy.	
Communication Strategies	
●	Utilize augmentative and alternative communication methods (e.g., picture-exchange systems, speech-generating devices, sign language), as needed.
●	Combine methods of presenting information (i.e., oral, visual) whenever possible.
●	Use visual schedules to help the client orient to what you will be doing in session and what to expect.
●	Social stories and picture schedules may also be helpful when teaching a new skill.
●	Break lessons down into smaller steps and scaffold the client’s skill-building (e.g., “show, tell, do”).
●	Increased repetition and practice may allow for better generalization of learned information and skills.
●	Include opportunities for increased use of information and skill practice across contexts (e.g., school, home, community).
●	Due to variable language and attention capabilities, clients may benefit from the use of technology (e.g., iPads, computers) in both therapy lessons and practice.
●	If client is struggling to stay on topic or is talking for long periods of time about a restricted interest: <ul style="list-style-type: none"> • Provide clear redirection to the topic you are working on and set limits around discussion of restricted interests. (e.g., “I can tell you really love Minecraft. We’re not going to talk about Minecraft right now because we have some work to do. When we have a break in 10 minutes, we can talk about Minecraft some more.”).
Social Strategies	
●	It may take more time to build rapport. <ul style="list-style-type: none"> • Learn the client’s individual communication and interactions styles. • Capitalize on special interests. • Spend time engaging in a preferred activity to put client at ease (e.g., draw picture, listen to favorite music, build Legos).
●	Social skills, particularly regarding appropriate and inappropriate social behaviors, may need to be explicitly taught in session.
●	Well-established social skill group curriculum materials and lessons may be helpful resources for therapists in teaching these skills.
●	To help generalize social skills, clients may benefit from opportunities to practice skills in multiple contexts with help from caregivers, peers, and providers.
●	Clients may struggle with social boundaries and may engage in socially disinhibited behavior or topics of conversation. <ul style="list-style-type: none"> • Set clear expectations around physical contact or appropriate topics (e.g., requesting high fives instead of hugs, redirecting if the client asks too personal a question).
●	Help to elucidate “hidden” rules of social interaction and everyday activities (e.g., when someone comes to the door, say, “Hello”) or new therapeutic skills (e.g., when I feel sad, I will use this coping skill).
RRB Strategies	
●	Consider the client’s unique presentation of restricted and repetitive behaviors during therapeutic planning and how these symptoms may change or interact with presenting concern (e.g., traumatic stress symptoms, anxiety). Exacerbation of RRBs may occur in response to emotional distress, resulting in treatment targets focused on reduction of severity and frequency to baseline levels.
Restricted Interests and Repetitive Behaviors	
●	Given the pervasive nature of restricted interests, clients may refer to their own experiences, including events perceived as traumatic, within the context of their restricted interests.
●	Circumscribed interests can be a source of motivation and a key anchor or framework for communication throughout treatment.

Considerations for ASD Specific Treatment Modifications: Suggestions for ASD Specific TF-CBT adaptations. Systematic empirical evaluation of these proposed adaptations is needed to assess efficacy.	
Communication Strategies	
<ul style="list-style-type: none"> • Utilize the client’s restricted interests while teaching new skills (e.g., create instructional materials with theme of preferred interest) and provide tangible reinforcements (e.g., access to preferred interest with completion of task demand). 	
<ul style="list-style-type: none"> ● Avoid punishment of repetitive behaviors (e.g., repetitive hand mannerisms, use of objects), which may be associated with anxiety or distress. <ul style="list-style-type: none"> • Instead, teach replacement behaviors such as adaptive coping strategies. 	
Routine, Rigidity, and Rules	
<ul style="list-style-type: none"> ● When a client has strong preferences for routine, organization and consistency of agendas during treatment may improve compliance and alleviate anxiety. 	
<ul style="list-style-type: none"> ● Rigidity and tendency towards rule-based thinking can be capitalized on in treatment to teach new skills. 	
<ul style="list-style-type: none"> ● Develop clear rules about what should be done and when that are structured and easy for a client to follow. <ul style="list-style-type: none"> • It can be helpful to present rules visually or to develop tangible materials such as ‘rule books’ using pictures and words. 	
<ul style="list-style-type: none"> ● Positively phrased rules (e.g., “When this happens, do this...”) are generally more helpful than negatively phrased rules (e.g., “Don’t do this...”). 	
Sensory Sensitivities	
<ul style="list-style-type: none"> ● Individuals with ASD may seek out certain sensory sensations (e.g., seeking external pressure, smells, tastes, touch), while others may have aversions to different sensory experiences (e.g., sensitive to noises, smells, textures). Sometimes an individual can present with both. 	
<ul style="list-style-type: none"> ● It is important to find out about a client’s preferences in order to better understand his her behaviors, as well as to provide potential strategies for calming a client. 	
<ul style="list-style-type: none"> ● It may take some trial and error to find sensory activities that are calming. <ul style="list-style-type: none"> • For example, play-doh may be a highly preferred sensory activity for one client, but it may be aversive to another. • Asking caregivers and teachers what works at home and at school is a good place to start. 	
<ul style="list-style-type: none"> ● Introduce relaxation activities that are mindful of a client’s sensory sensitivities or needs (e.g., listening to calming music, dimming the lights, providing a weighted blanket or vest). 	
<ul style="list-style-type: none"> ● Sensory-seeking tendencies may make clients vulnerable to risky or unsafe situations. <ul style="list-style-type: none"> • For example, an individual’s desire to touch other people’s hair or ears for the sensory input may cause them to approach strangers inappropriately, thus potentially putting them in a vulnerable situation or putting them at risk of being misunderstood. 	
Additional Behavioral Strategies	
<ul style="list-style-type: none"> ● In general, evidenced-based behavioral strategies for addressing non-compliance and disruptive behaviors in neurotypical populations (e.g., clear instructions expectations, praising desired behaviors, planned ignoring, structure routine, and rewards) are likely to be helpful for individuals with ASD. 	
<ul style="list-style-type: none"> ● Continually evaluate the appropriateness of task demands during treatment. ● If the client becomes dysregulated during session, it is important to consider whether they “cannot” or “will not” participate. <ul style="list-style-type: none"> • If the demand is incongruent with the individual’s skills, the structure of sessions and the clinician’s expectations may need to be adjusted. 	
<ul style="list-style-type: none"> ● Individuals with ASD often need additional time to transition from one activity to another, especially from preferred to less preferred activities. ● Give advanced warning before a transition (e.g., “In 2 minutes, iPad time will be over and it will be time to work.”) 	

Considerations for ASD Specific Treatment Modifications: Suggestions for ASD Specific TF-CBT adaptations. Systematic empirical evaluation of these proposed adaptations is needed to assess efficacy.	
Communication Strategies	
<ul style="list-style-type: none"> • Be accurate and follow through on time limits. • Visual timers can be used to delineate time spent working vs. playing. 	<ul style="list-style-type: none"> ● Build in frequent breaks during sessions, as clients may have more trouble sustaining attention and motivation compared to typically developing peers.
<ul style="list-style-type: none"> ● Provide praise for positive desired behaviors. ● Tangible incentives or time engaging in preferred activities may help increase participation and compliance. 	
Safety Strategies	
<ul style="list-style-type: none"> ● If a client begins exhibiting aggressive or self-injurious behaviors, pay attention to ways to make the environment safe for your client and those around them (e.g., removing dangerous objects, creating space between you and the client). 	
<ul style="list-style-type: none"> ● Use concrete, firm language depending on the client’s developmental level (e.g., “no hitting,” “keep your body safe,” “I don’t feel safe”). 	
<ul style="list-style-type: none"> ● If a client becomes dysregulated, reduce task demands and decrease the amount of sensory input in the room (e.g., quiet the room, dim bright lights). 	
<ul style="list-style-type: none"> ● It may take more time for an individual with ASD to return to baseline <ul style="list-style-type: none"> • Allow space, and look for the first appropriate behavior you can praise after a client has calmed. 	
<ul style="list-style-type: none"> ● As mentioned previously, individuals with ASD may struggle with understanding and respecting social boundaries, both physically and in conversation. <ul style="list-style-type: none"> • Set clear and concrete expectations about appropriate topics or gestures of affection, as needed. 	

Adaptations of Trauma-Focused Cognitive Behavioral Therapy

There are multiple components to TF-CBT that necessitate specific adaptations to support the client with ASD.

Trauma Exposure Screening

Similar to CBT modifications for younger children and ID, it will likely be important to limit assessment and intervention strategies that rely significantly on verbal language or abstract cognitive reasoning when working with children and adolescents with ASD. When indicated, augmentative and alternative communication methods (e.g., communication boards/books, picture-exchange communication system, speech-generating devices, sign language, etc.) can be utilized to accommodate individuals’ language abilities and deficits. When assessing exposure to various traumatic events, reliance on the report of an individual with ASD may be challenging. Individuals with ASD may think more concretely about the examples provided and/or may fail to generalize questions to other scenarios and contexts they experience. Differences in social awareness and perception that characterize ASD may impact the way events and experiences are interpreted. Something that caregivers or other adults might perceive as traumatic may not impact a client with ASD as negatively. Conversely, events that might be perceived as minor to others may be experienced as traumatic to a client with ASD (e.g., an adolescent with ASD experiencing significant distress over a single instance of spanking when they were a toddler).

It is important to identify the source of the trauma with the use of multiple reporters (e.g., other caregivers, siblings, teachers) to ensure an accurate picture of an adverse event is being provided when possible. If decisions need to be made regarding supervision, child protection, or legal matters (i.e., objective support of the client), it may be difficult to gather necessary information directly from the client. Rather, the client's caregiver may need to be a primary source of information. If the caregiver is the perpetrator, determine other caregivers, teachers, or providers that may help in understanding the client's support needs.

When presenting a list of traumatic events to clients with ASD for the purposes of assessment, it may be helpful to provide the list both orally and in writing. Individuals with ASD demonstrate a wide array of communication abilities and difficulties and may require extensive supports with pragmatic and syntactic aspects of language when reporting traumatic events and when developing the trauma narrative (e.g., providing concrete descriptions of events, simplifying language used, avoiding use of metaphorical speech, combining oral speech with visual representations and/or written language). It may also be beneficial to explore alternate means for clients to share their experiences, such as visuals, puppets, drawing, play with their own toys from home, and sensory activities (e.g., play-doh, sand). Clinicians should consider extant research on traumatic stress symptom presentation in ASD during the assessment process to aide in differential diagnosis and treatment planning. Clinical symptoms that may indicate the presence of traumatic stress reactions in response to an adverse event include fear behaviors and tantrums, new behavioral difficulties, increased RRBs, deterioration of social-communication skills and adaptive functioning, and alterations in vegetative functions (e.g., sleep, appetite). The presentation of these symptoms may also indicate the need for closer examination of more internalized trauma symptoms such as distressing memories, intrusive thoughts, loss of interest, and lethargy (Mehtar & Mukaddes, 2011).

Psychoeducation about Trauma

It will be essential to consider developmental level and language abilities of clients with ASD when designing psychoeducation materials and activities during treatment. The use of visual aids when discussing trauma symptoms (e.g., use of cartoons and formation of a narrative surrounding symptoms) and visual activity schedules (VAS; Knight, Sartini, & Spriggs, 2015) to outline expectations and the course of treatment can be helpful (e.g., VAS to outline the steps in treatment) to facilitate communication, assist with transitions, and decrease challenging behaviors. Throughout treatment, clinicians should consult with caregivers to determine optimal ways to teach concepts to clients with ASD. Generalizing new skills across various settings is often challenging for individuals with ASD and will necessitate opportunities to practice skills in multiple contexts with the help of caregivers and providers (e.g., parents, teachers, clinicians, peers). In addition, it is also essential that clinicians utilize caregivers to help reinforce information and skills learned in session through review of homework. A growing body of literature has started to explore parent training programs for individuals with ASD, and this method of intervention has been found to be effective in reducing children's disruptive and noncompliant behaviors (e.g., The RUBI Autism Network Parent Training for Disruptive Behaviors; Bearss et al., 2013; Bearss et al., 2015). Given these results, including a significant parent-training component in the

treatment of trauma as a part of the TF-CBT parent-child sessions may bolster treatment effects and outcomes.

Given the presence of social, cognitive, executive functioning, and emotional processing deficits in ASD, additional time and practice will likely be needed to teach emotional states and physiological cues of different emotions, body awareness, and risk-reduction skills. Still, tasks such as recognition of affective states may be a consistent challenge for this population, and developing typical or advanced skills in these areas should not be belabored or stall treatment. When making sure basic needs are being met for a client, such as regular sleep, diet, and hygiene, it is important to note these behaviors can be uniquely disrupted in individuals with ASD (Souders et al., 2009). Explicit teaching and contingency plans may be needed to help caregivers establish healthy daily-living routines with individuals with ASD.

Stress Management, Affect Expression and Modulation, and Cognitive Coping

Teaching specific skills for calming and reducing stress in the moment should be tailored to each individual's developmental level and modified as necessary. Creating a structured way of organizing trauma cues or triggers will likely be beneficial for clients with ASD as well. For example, create a list of possible triggers and support the client in choosing which ones apply to them. Some individuals with ASD will excel in learning calming exercises particularly if the exercises are presented with concrete steps and repetition of practice leads to the development of a routine. Increasing structure and repetition for specific coping strategies will be important for individuals with ASD. Incorporating preferred interests to facilitate client engagement and motivation will also be important during the process of learning new skills. For example, if an individual was particularly interested in Batman comics, the clinician might create a Batman-themed visual schedule and generate behavioral expectations that incorporate Batman (e.g., "When Batman gets frustrated, he's learned to take a deep breath to help himself calm down"). Social stories are a widely used strategy for preparing individuals with ASD for challenging situations, and may be particularly helpful when teaching safety skills and socially appropriate behavior. It may be beneficial to incorporate a client's specific interest in the story (e.g., "Batman goes to recess"). Role-playing can be helpful for individuals with ASD, but they may also need more concrete guidelines to increase participation and learning. For example, create a "stage" for role-play (e.g., a paper with shoe-prints on it) and draft specific rules and/or steps for participating in each role-play scenario. Sensory needs should also be considered when introducing stress-management strategies. Coping strategies based on sensory needs such as movement breaks, handheld massage ball, listening to favorite song or video, essential oils, water or sand table, the use of a weighted blanket can be used to help with relaxation and coping with distress.

Given that language and communication are closely tied with emotional expression, individuals with ASD and those with limited language ability are likely to evidence challenges with recognizing, labeling, and describing emotions. While teaching affect expression and modulation skills, providers should provide ample support to the client including assistance labeling and discussing emotions. As mentioned above, individuals with ASD often struggle with verbal and abstract reasoning as well as difficulties with self-awareness and introspection, and they may not be able to identify, analyze, or modify

cognitive schema during the cognitive coping stage of treatment. Thought stopping may be challenging due to cognitive awareness deficits. Therefore, additional time and practice may be necessary to identify and monitor thoughts. Utilization of visual methods while teaching and practicing cognitive coping skills such as the use of a “stop sign” as a visual cue, a picture in a journal, or idiosyncratic symptom and visuals used for replacement positive cognitions may be helpful as well. Clinicians can use rule-based teaching to facilitate learning and use of stress management, affect modulation, and cognitive coping skills as mentioned earlier (e.g., “When you feel sad, use this skill;” “When you have this thought, do this...”). Clinicians may need to spend more time in this area of treatment relative to other populations to prepare for subsequent phases of treatment are more distress evoking (e.g., in vivo exposure) particularly if aggressive, disruptive, or withdrawn behaviors occur in response to trauma related distress. Significant support from caregivers and providers to promote coping skills acquisition and practice will be needed before greater independence in use.

Trauma Narrative (Imaginal Exposure and Cognitive Processing)

Currently there is little information regarding how individuals with ASD may process, encode, or retrieve information during a potentially traumatic event in memory. Use of a trauma narrative during therapy may require a range of adaptations. Given difficulties with recall of personal events seen in many individuals with ASD, eliciting a trauma narrative may be challenging. For some clients with ASD, the trauma narrative may not be conducive to their developmental level and/or communication abilities. If clients are struggling significantly with the development of a trauma narrative, despite adaptations, it may be appropriate to focus on other elements of treatment (e.g., coping skills training, in vivo exposures). Alternatively, when the trauma narrative component seems appropriate and clients with ASD are struggling to generate material, it may be helpful for clinicians to provide a simple and concrete narrative for clients (e.g., “The boy did a bad thing to you when he hit you with the stick. It is not your fault. It is his fault. You are strong and can handle it.”). Clinicians should utilize caution, however, in these instances and avoid including unnecessary details or interpretations of the event or experience. It may be useful to construct a trauma narrative with the client and caregiver through visual aids, the creation of a story, or familiar and concrete play. Since play skills are often underdeveloped in individuals with ASD, there may be a limit to the use of play to incite processing of a traumatic event. Utilizing technologies to create a story (e.g., iPad, video clips) may be useful for this population. Another helpful adaptation of the trauma narrative may include having a child draw pictures and dictate short simple captions for pictures such as “That was not safe” and “You are safe now”. Explicit teaching of self-regulation strategies will be particularly important for addressing more disruptive behaviors in response to the distress of the narrative process.

In-Vivo Exposure to Trauma Reminders

Many individuals with ASD respond well to exposure when it is presented in a concrete and scaffolded manner. This may be an area of strength when conducting treatment with this population. For some individuals with ASD, due to limited self-awareness, they may experience less anticipatory distress before exposures and therefore display better

participation, more willingness to practice and less time necessary to manage avoidance or refusal to engage in exposure trials. On the other hand, individuals with ASD may evidence difficulties with self-reflection and communication of past experiences and struggle to conduct imaginal exposure from the first person (e.g., may refer to themselves in the third person or confuse pronouns “You” for “I”). Providers will want to identify and accommodate client’s unique use of language to communicate their experience (e.g., referring to self as character related to preferred interest such as Batman or using “you” to mean “I”). It will be important while working with this population to create a step-by-step plan for exposure and to introduce the activity in a structured way, as well as to develop clear contingency plans to incentivize exposure practice. Generally, external rewards are essential when conducting in-vivo exposure with individuals with ASD. It may be necessary to adapt the rating system (e.g., SUDS) used to measure distress during exposure (e.g., reduced scale, individualized visual representation) and beneficial to provide clear examples of different ratings, along with personalized physiological cues. It is likely more time may be needed to teach clients with ASD to accurately rate their distress. Providers may also observe improvement in symptoms even if client ratings do not appear accurate on SUDS given natural process of habituation.

Parent-Child Sessions

Active involvement of caregivers and other providers as appropriate will be essential throughout treatment. When sharing the trauma narrative, it will be important to determine the optimal way clients can communicate their feelings and experiences, whether that be through verbal or nonverbal communication. Additional time may be needed to progress to the sharing of the trauma narrative or starting with personal safety skills. Family members of individuals with ASD may present with their own social-communication challenges, making it important to spend ample time ensuring their understanding of their child’s symptoms, triggers, and coping skills. Parent psychoeducation and behavioral management training are essential components of successful systems based treatment in this area. Care and additional time as necessary should be taken to assess parents’ readiness to provide appropriate responses to their child through modeling and practice. Treatment focus should also include working with caregivers to address client difficulties with basic needs, such as regular sleep, diet, and hygiene, which can be uniquely disrupted in individuals with ASD. Similarly, extending beyond family members, the consistent involvement of others in the child’s caregiver system, such as educators and clinicians, will be essential to ensuring effective support.

Safety

Individuals with ASD often struggle to distinguish socially appropriate interactions from inappropriate ones. Individuals with ASD may want to share their trauma narrative with individuals that may be deemed unsafe (e.g., strangers, peers at school). It is important to be explicit about safe people with whom to share their thoughts, feelings, and experiences. For some individuals with ASD, social disinhibition is a presenting challenge (e.g., climbing onto strangers’ laps, hugging, holding hands). This might be hard to tease apart from behaviors associated with an adverse event. Teaching safe versus unsafe behaviors will be important and may require more time and repetition with clients with ASD.

Summary

The limited existing research suggests the characteristics and associated features of ASD appear to influence this population's risk of potentially traumatic events, the experience of traumatic stress, and the susceptibility to traumatic stress psychopathology, although there is significant need for more research to elucidate these areas. The current preliminary recommendations for adapting current evidenced-based, trauma-specific interventions, specifically TF-CBT, highlight the need to incorporate treatment goals related to ASD core symptoms and associated characteristics during treatment targeting traumatic stress symptoms, including adaptive skills and self-care. ASD core deficits, as well as strengths, and associated cognitive, learning and behavioral features need to be considered and addressed when screening for trauma, assessing and understanding a client's perception and experience of trauma, and when developing and implementing individualized treatment plans. Additionally, as with many forms of child treatment, involvement of the caregiver and other providers is paramount for successful generalization of skill development across contexts. Adaptations to existing empirically supported treatments are key for working with individuals with ASD. When addressing trauma, this article highlighted several adaptations that may help facilitate a more successful assessment and treatment process, including use of alternative modes of communication, creation of visual aids and schedules, increased time and repetition, incorporation of circumscribed or restricted interests, and explicit teaching of socially appropriate behaviors. These recommendations are grounded in well-established and evidence-based practices for working with individuals with ASD.

Future Directions for ASD and Trauma

Empirical evidence regarding the incidence and presentation of traumatic stress and PTSD in individuals with ASD is lacking despite indications that this population may be at increased risk for experiencing significant stressors and for developing traumatic stress responses. The development and validation of measures for the evaluation of trauma reactions in youth with ASD are crucial objectives in moving the field forward and for providing care for this underserved population with elevated risk. Instruments for trauma assessment in this population will need to account for a wide range of functioning levels and for potential psychiatric-symptom overlap. Additionally, to date, there are no evidenced-based treatments for PTSD or traumatic stress specifically for individuals with ASD. Research indicates, however, that therapies based in CBT approaches can be used successfully with both very young children, children with ASD and comorbid psychiatric conditions, and individuals with ID. These promising results suggest that, with ASD-sensitive modifications, TF-CBT may be an effective treatment for children with ASD who have experienced trauma. Systematic evaluations including randomized controlled trials of well-supported treatments such as TF-CBT in ASD populations are needed to inform treatment practices and to serve this growing population. Ultimately, collaboration between professionals specializing in ASD and trauma/PTSD are needed to first understand the prevalence and manifestation of traumatic stress in this population and second to investigate interventions that can effectively address traumatic stress symptomology in children and adults with ASD.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Anderson C, Law JK, Daniels A, Rice C, Mandell DS, Hagopian L, & Law PA (2012). Occurrence and family impact of elopement in children with autism spectrum disorders. *Pediatrics*, 130(5), 870–877. [PubMed: 23045563]
- Anderson SR, Taras M, & Cannon BO (1996). Teaching new skills to young children with autism In Maurice C, Green G, & Luce SC (Eds.), *Behavioral intervention for young children with autism* (pp. 181–194). Austin, TX: Pro-Ed.
- Bailey A, Le Couteur A, Gottesman I, Bolton P, Simonoff E, Yuzda E, & Rutter M (1995). Autism as a strongly genetic disorder: Evidence from a British twin study. *Psychological Medicine*, 25(1), 63–77. [PubMed: 7792363]
- Baio J, Wiggins L, Christensen DL, Maenner MJ, Daniels J, Warren Z, ... Dowling NF (2018). Prevalence of autism spectrum disorder among children aged 8 years — Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2014. *MMWR Surveill Summaries*, 67(SS-6), 1–23. doi: 10.15585/mmwr.ss6706a1
- Baron-Cohen S, Leslie AM, & Frith U (1985). Does the autistic child have a “theory of mind”? *Cognition*, 21, 37–46. [PubMed: 2934210]
- Baron-Cohen S, Wheelwright S, Hill J, Raste Y, & Plumb I (2001). The “Reading the Mind in the Eyes” Test revised version: A study with normal adults, and adults with Asperger syndrome or high-functioning autism. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 42(2), 241–251.
- Bauminger N (2002). The facilitation of social-emotional understanding and social interaction in high-functioning children with autism: Intervention outcomes. *Journal of Autism and Developmental Disorders*, 32(4), 283–98. [PubMed: 12199133]
- Bauminger N (2007a). Brief report: Individual social-multi-modal intervention for HFASD. *Journal of Autism and Developmental Disorders*, 37(8), 1593–1604. [PubMed: 17072753]
- Bauminger N (2007b). Brief report: Group social-multimodal intervention for HFASD. *Journal of Autism and Developmental Disorders*, 37(8), 1605–1615. [PubMed: 17072752]
- Bearss K, Johnson C, Handen B, Smith T, & Scahill L (2013). A pilot study of parent training in young children with autism spectrum disorders and disruptive behavior. *Journal of Autism and Developmental Disorders*, 43(4), 829–840. [PubMed: 22941342]
- Bearss K, Johnson C, Smith T, Lecavalier L, Swiezy N, Aman M, ... Scahill L (2015). Effect of parent training vs parent education on behavioral problems in children with autism spectrum disorder: A randomized clinical trial. *JAMA*, 313(15), 1524–1533. [PubMed: 25898050]
- Beaumont R, & Sofronoff K (2008). A multi-component social skills intervention for children with Asperger Syndrome: The Junior Detective Training Program. *Journal of Child Psychology and Psychiatry*, 49(7), 743–753. [PubMed: 18503531]
- Bennetto L, Pennington BF, & Rogers SJ (1996). Intact and impaired memory functions in autism. *Child development*, 67(4), 1816–1835. [PubMed: 8890510]
- Bird G, & Cook R (2013). Mixed emotions: The contribution of alexithymia to the emotional symptoms of autism. *Translational Psychiatry*, 3(7), E285. [PubMed: 23880881]
- Bird V, Premkumar P, Kendall T, Whittington C, Mitchell I, & Kuipers E (2010). Early intervention services, cognitive-behavioural therapy and family intervention in early psychosis: Systematic review. *The British Journal of Psychiatry: The Journal of Mental Science*, 197(5), 350–6. [PubMed: 21037211]
- Bishop SL, Hus V, Duncan A, Huerta M, Gotham K, Pickles A, ... Lord C (2013). Subcategories of restricted and repetitive behaviors in children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 43(6), 1287–1297. [PubMed: 23065116]
- Bishop SL, Richler I, & Lord C (2006). Association between restricted and repetitive behaviors and nonverbal IQ in children with autism spectrum disorders. *Child Neuropsychology*, 12(4-5), 247–267. [PubMed: 16911971]

- Black MH, Chen NT, Iyer KK, Lipp OV, Bölte S, Falkmer M, ... Girdler S (2017). Mechanisms of facial emotion recognition in autism spectrum disorders: Insights from eye tracking and electroencephalography. *Neuroscience & Biobehavioral Reviews*, 80, 488–515. [PubMed: 28698082]
- Bolton PF, Carcani-Rathwell I, Hutton J, Goode S, Howlin P, & Rutter M (2011). Epilepsy in autism: Features and correlates. *The British Journal of Psychiatry*, 198(4), 289–294. doi:10.1192/bjp.bp.109.076877 [PubMed: 21972278]
- Boucher J (2012). Research review: Structural language in autistic spectrum disorder – characteristics and causes. *Journal of the American Academy of Child and Adolescent Psychiatry*, 53(3), 219–33. doi: 10.1111/j.1469-7610.2011.02508.x
- Boucher J, Lewis V, & Collis G (1998). Familiar face and voice matching and recognition in children with autism. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 39(2), 171–181.
- Boucher J, Mayes A, & Bigham S (2012). Memory in autistic spectrum disorder. *Psychological Bulletin*, 138(3), 458–496. [PubMed: 22409507]
- Boyd BA, Conroy MA, Mancil GR, Nakao T, & Alter PJ (2007). Effects of circumscribed interests on the social behaviors of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 37(8), 1550–1561. [PubMed: 17146704]
- Brenner J, Pan Z, Mazefsky C, Smith K, & Gabriels R (2017). Behavioral symptoms of reported abuse in children and adolescents with autism spectrum disorder in inpatient settings. *Journal of Autism and Developmental Disorders*, 07 6 2017.
- Buck TR, Viskochil J, Farley M, Coon H, McMahan WM, Morgan J, & Bilder DA (2014). Psychiatric comorbidity and medication use in adults with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 44(12), 3063–3071. [PubMed: 24958436]
- Buie T, Campbell DB, Fuchs GJ, Furuta GT, Levy J, Vandewater J, ... Winter H (2010). Evaluation, diagnosis, and treatment of gastrointestinal disorders in individuals with ASDs: A consensus report. *Pediatrics*, 125(1), S1–18. [PubMed: 20048083]
- Chalfant AM, Rapee R, & Carroll L (2007). Treating anxiety disorders in children with high functioning autism spectrum disorders: A controlled trial. *Journal of Autism and Developmental Disorders*, 37(10), 1842–1857. [PubMed: 17171539]
- Christensen DL, Baio J, Braun KV, Bilder D, Charles J, Constantino JN, ... Yeargin-Allsopp M (2016a). Prevalence and characteristics of Autism Spectrum Disorder among children aged 8 years — Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2012. *MMWR Surveill Summaries*, 65(3), 1–23. doi: 10.15585/mmwr.ss6503a1
- Christensen DL, Bilder DA, Zahorodny W, Pettygrove S, Durkin MS, Fitzgerald RT, ... Yeargin-Allsopp M (2016b). Prevalence and characteristics of autism spectrum disorder among 4-year-old children in the autism and developmental disabilities monitoring network. *Journal of Developmental & Behavioral Pediatrics*, 37(1), 1–8. [PubMed: 26651088]
- Cohen JA, & Mannarino AP (1996). A treatment outcome study for sexually abused preschool children: Initial findings. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(1), 42–50. [PubMed: 8567611]
- Cohen JA, & Mannarino AP (1998). Interventions for sexually abused children: Initial treatment outcome findings. *Child Maltreatment*, 3(1), 17–26.
- Cohen JA, Mannarino AP, & Deblinger E (2006). *Treating trauma and traumatic grief in children and adolescents*. New York, NY: Guilford Press.
- Cohen JA, Mannarino AP, & Deblinger E (Eds.). (2012). *Trauma-focused CBT for children and adolescents: Treatment applications*. Guilford Press.
- Cohen JA, & Mannarino AP (2008). Trauma- focused cognitive behavioural therapy for children and parents. *Child and Adolescent Mental Health*, 13(4), 158–162.
- Cohen JA, Mannarino AP, Deblinger E (2017). *Treating trauma and traumatic grief in children and adolescents* (2nd ed.). New York, NY: Guilford Press.
- Cook R, Brewer R, Shah P, & Bird G (2013). Alexithymia, not autism, predicts poor recognition of emotional facial expressions. *Psychological Science*, 24(5), 723–732. [PubMed: 23528789]

- Cook EH, Kieffer JE, Charak DA, & Leventhal BL (1993). Autistic disorder and post-traumatic stress disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 32(6), 1292–1294. [PubMed: 8282677]
- Copeland W, Keeler G, Angold A, & Costello E (2007). Traumatic events and posttraumatic stress in childhood. *Archives of General Psychiatry*, 64(5), 577–584. [PubMed: 17485609]
- Corbett BA, Mendoza S, Wegelin J, Carmean V, & Levine S (2008). Variable cortisol circadian rhythms in children with autism and anticipatory stress. *Journal of Psychiatry Neuroscience*, 33(3), 227–234. [PubMed: 18592041]
- Corbett BA, Shupp CW, Simon D, Ryan N, & Mendoza S (2010). Elevated cortisol during play is associated with age and social engagement in children with autism. *Molecular Autism*, 1(1), 1–13. [PubMed: 20678244]
- Croen LA, Grether JK, Yoshida CK, Odouli R, & Hendrick V (2011). Antidepressant use during pregnancy and childhood autism spectrum disorders. *Archives of General Psychiatry*, 68(11), 1104–1112. doi:10.1001/archgenpsychiatry.2011.73 [PubMed: 21727247]
- Croen L, Grether J, Yoshida C, Odouli R, & Van de Water J (2005). Maternal autoimmune diseases, asthma and allergies, and childhood autism spectrum disorders: A case-control study. *Archives of Pediatrics & Adolescent Medicine*, 159(2), 151–157. [PubMed: 15699309]
- Daniel J, & Wood J (2013). Cognitive behavioral therapy for children with autism: Review and considerations for future research. *Journal of Developmental and Behavioral Pediatrics*, 34(9), 702–715. [PubMed: 23917373]
- Dawson G, Carver L, Meltzoff AN, Panagiotides H, McPartland J, & Webb SJ (2002a). Neural correlates of face and object recognition in young children with autism spectrum disorder, developmental delay, and typical development. *Child Development*, 73(3), 700–717. [PubMed: 12038546]
- Dawson G, Meltzoff AN, Osterling J, Rinaldi J, & Brown E (1998). Children with autism fail to orient to naturally occurring social stimuli. *Journal of Autism and Developmental Disorders*, 28(6), 479–485. [PubMed: 9932234]
- Dawson G, Rogers S, Munson J, Smith M, Winter J, Greenson J, ... & Varley J (2010). Randomized, controlled trial of an intervention for toddlers with autism: the Early Start Denver Model. *Pediatrics*, 125(1), 17–23.
- Dawson G, Toth K, Abbott R, Osterling J, Munson J, Estes A, & Liaw J (2004a). Early social attention impairments in autism: Social orienting, joint attention, and attention to distress. *Developmental Psychology*, 40(2), 271–283. [PubMed: 14979766]
- Dawson G, Webb S, & McPartland J (2005). Understanding the nature of face processing impairment in autism: Insights from behavioral and electrophysiological studies. *Developmental Neuropsychology*, 27(3), 403–24. [PubMed: 15843104]
- De Bruin EI, Ferdinand RF, Meester S, De Nijs PFA, & Verheij F (2007). High rates of psychiatric comorbidity in PDD-NOS. *Journal of Autism and Developmental Disorders*, 37(5), 877–886. [PubMed: 17031447]
- Delano M, & Snell M (2006). The effects of social stories on the social engagement of children with autism. *Journal of Positive Behavior Interventions*, 8(1), 29–42.
- Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, & Marks JS (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, 14(4), 245–258. [PubMed: 9635069]
- Foulkes L, Bird G, Gokcen E, McCrory E, & Viding E (2015). Common and distinct impacts of autistic traits and alexithymia on social reward. *PLoS ONE*, 10(4), E0121018. [PubMed: 25853670]
- Frith CD, & Frith U (2006). The neural basis of mentalizing. *Neuron*, 50(4), 531–534. [PubMed: 16701204]
- Gidaya N, Lee B, Burstyn I, Michael Y, Newschaffer C, & Mortensen E (2016). In utero exposure to beta-2-adrenergic receptor agonist drugs and risk for autism spectrum disorders. *Pediatrics*, 137(2), E20151316. [PubMed: 26738885]

- Gilbert-MacLeod CA, Craig KD, Rocha EM, & Mathias MD (2000). Everyday pain responses in children with and without developmental delays. *Journal of Pediatric Psychology*, 25(5), 301–308. [PubMed: 10880060]
- Gilman SR, Iossifov I, Levy D, Ronemus M, Wigler M, & Vitkup D (2011). Rare de novo variants associated with autism implicate a large functional network of genes involved in formation and function of synapses. *Neuron*, 70(5), 898–907. [PubMed: 21658583]
- Green J, Leadbitter K, Kay C, & Sharma K (2016). Autism spectrum disorder in children adopted after early care breakdown. *Journal of Autism and Developmental Disorders*, 46(4), 1392–1402. [PubMed: 26739357]
- Happé F, & Booth R (2008). The power of the positive: Revisiting weak coherence in autism spectrum disorders. *Quarterly Journal of Experimental Psychology*, 61(1), 50–63.
- Happé F, & Frith U (2006). The weak coherence account: detail-focused cognitive style in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 36(1), 5–25. [PubMed: 16450045]
- Hatton C, & Emerson E (2004). The relationship between life events and psychopathology amongst children with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 17(2), 109–117.
- Hayashi M, Kato M, Igarashi K, & Kashima H (2008). Superior fluid intelligence in children with Asperger's disorder. *Brain and Cognition*, 66(3), 306–310. [PubMed: 17980944]
- Heaton P, & Wallace G (2004). Annotation: The savant syndrome. *Journal of Child Psychology and Psychiatry*, 45, 899–911. doi:10.1111/j.1469-7610.2004.t01-1-00284.x [PubMed: 15225334]
- Hibbard RA, & Desch LW (2007). Maltreatment of children with disabilities. *Pediatrics*, 119(5), 1018–1025. [PubMed: 17473105]
- Hill E (2004). Executive dysfunction in autism. *Trends in Cognitive Sciences*, 8(1), 26–32. [PubMed: 14697400]
- 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. [PubMed: 15162941]
- Hong ER, Neely L, & Lund EM (2015). Addressing bullying of students with autism: Suggestions for families and educators. *Intervention in School and Clinic*, 50(3), 157–162.
- Howlin P (2003). Outcome in high-functioning adults with autism with and without early language delays: implications for the differentiation between autism and Asperger syndrome. *Journal of Autism and Developmental Disorders*, 33(1), 3–13. [PubMed: 12708575]
- Howlin P (2012). Understanding savant skills in autism. *Developmental Medicine & Child Neurology*, 54(6), 484. [PubMed: 22409485]
- Itring S, Magnusson C, Lundberg M, Ek M, Rai D, Svensson A, ... Lee B (2014). Parental age and the risk of autism spectrum disorders: Findings from a Swedish population-based cohort. *International Journal of Epidemiology*, 43(1), 107–115. [PubMed: 24408971]
- Jacquemont S, Bradley PC, Hersch M, Duyzend MH, Krumm N, Bergmann S, ... Eichler EE (2014). A higher mutational burden in females supports a “female protective model” in neurodevelopmental disorders. *The American Journal of Human Genetics*, 94(3), 415–425. [PubMed: 24581740]
- Johnson S, Hollis C, Kochhar P, Hennessy E, Wolke D, & Marlow N (2010). Autism spectrum disorders in extremely preterm children. *The Journal of Pediatrics*, 156(4), 525–531.e2. [PubMed: 20056232]
- Joshi G, Wozniak J, Petty C, Martelon M, Fried R, Bolfek A, ... Biederman J (2013). Psychiatric comorbidity and functioning in a clinically referred population of adults with autism spectrum disorders: A comparative study. *Journal of Autism and Developmental Disorders*, 43(6), 1314–1325. [PubMed: 23076506]
- Kana R, Maximo J, Williams D, Keller T, Schipul S, Cherkassky V, ... Just M (2015). Aberrant functioning of the theory-of-mind network in children and adolescents with autism. *Molecular Autism*, 6, 59. [PubMed: 26512314]

- Kanne SM, & Mazurek MO (2011). Aggression in children and adolescents with ASD: Prevalence and risk factors. *Journal of Autism and Developmental Disorders*, 41(7), 926–937. [PubMed: 20960041]
- Kasari C, Rotheram-Fuller E (2007). Peer relationships of children with autism: Challenges and interventions In Hollander E & Anagnostou E (Eds.), *Clinical manual for the treatment of autism* (pp. 235–257). Washington, D.C.: American Psychiatric Publishing.
- Kerns CM, Newschaffer CJ, & Berkowitz SJ (2015). Traumatic childhood events and autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 45(11), 3475–3486. [PubMed: 25711547]
- Kim SH, Paul R, Tager-Flusberg H, & Lord C (2014). Language and communication in autism In Volkmar FR, Rogers S, Paul R, & Pelphrey KA (Eds.), *Volume 1: Diagnosis, development, and brain mechanisms* (4th ed., pp. 230–262). Hoboken, NJ: Wiley.
- King R, & Desaulnier C (2011). Commentary: Complex post-traumatic stress disorder: Implications for individuals with autism spectrum disorders -- Part II. *Journal on Developmental Disabilities*, 17(1), 47–59.
- Klin A, Jones W, Schultz R, Volkmar F, & Cohen D (2002). Visual fixation patterns during viewing of naturalistic social situations as predictors of social competence in individuals with autism. *Archives of General Psychiatry*, 59(9), 809–816. [PubMed: 12215080]
- Klin A, McPartland JC, Volkmar FR (2005). Asperger syndrome In Volkmar FR, Paul R, Klin A, & Cohen DJ (Eds.), *Handbook of autism and pervasive developmental disorders* (3rd ed., pp. 88–125). Hoboken, NJ: Wiley.
- Klin A, Sparrow SS, De Bildt A, Cicchetti DV, Cohen DJ, & Volkmar FR (1999). A normed study of face recognition in autism and related disorders. *Journal of Autism and Developmental Disorders*, 29(6), 499–508. [PubMed: 10638462]
- Knight V, Sartini E, & Spriggs AD (2015). Evaluating visual activity schedules as evidence-based practice for individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 45(1), 157–178. doi:10.1007/s10803-014-2201-z [PubMed: 25081593]
- Kohane IS, McMurry A, Weber G, MacFadden D, Rappaport L, Kunkel L, ...Churchill S (2012). The co-morbidity burden of children and young adults with autism spectrum disorders. *PLoS ONE*, 7(4), e33224. [PubMed: 22511918]
- Koning C, Magill-Evans J, Volden J, & Dick B (2013). Efficacy of cognitive behavior therapy-based social skills intervention for school-aged boys with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 7(10), 1282–1290.
- Krakow B, Hollifield M, Johnston L, Koss M, Schrader R, Warner TD, ...Prince H (2001). Imagery rehearsal therapy for chronic nightmares in sexual assault survivors with posttraumatic stress disorder: A randomized controlled trial. *JAMA*, 286(5), 537–545. [PubMed: 11476655]
- Kroese BS, & Thomas G (2006). Treating chronic nightmares of sexual assault survivors with an intellectual disability -Two descriptive case studies. *Journal of Applied Research in Intellectual Disabilities*, 19(1), 75–80.
- Kumar SL (2013). Examining the characteristics of visuospatial information processing in individuals with high-functioning autism. *The Yale Journal of Biology and Medicine*, 86(2), 147. [PubMed: 23766736]
- Lai M-C, Lombardo MV, & Baron-Cohen S (2014). Autism. *The Lancet*, 383(9920), 896–910.
- Lecavalier L (2006). Behavioral and emotional problems in young people with pervasive developmental disorders: Relative prevalence, effects of subject characteristics, and empirical classification. *Journal of Autism and Developmental Disorders*, 36(8), 1101–1114. [PubMed: 16897387]
- Lemmon VA, & Mizes JS (2002). Effectiveness of exposure therapy: A case study of posttraumatic stress disorder and mental retardation. *Cognitive and Behavioral Practice*, 9(4), 317–323.
- Levy D, Ronemus M, Yamrom B, Lee Y, Leotta A, Kendall J, . . Wigler M (2011). Rare de novo and transmitted copy-number variation in autistic spectrum disorders. *Neuron*, 70(5), 886–897. [PubMed: 21658582]
- Levy SE, Mandell DS, & Schultz RT (2009). Autism. *The Lancet*, 374(9701), 1627–1638.

- Leyfer OT, Folstein SE, Bacalman S, Davis NO, Dinh E, Morgan J, ... Lainhart JE (2006). Comorbid psychiatric disorders in children with autism: Interview development and rates of disorders. *Journal of Autism and Developmental Disorders*, 36(7), 849–861. [PubMed: 16845581]
- Lind S, & Bowler D (2010). Episodic memory and episodic future thinking in adults with autism. *Journal of Abnormal Psychology*, 119(4), 896–905. [PubMed: 20853917]
- Livanis A, Almodovar D, & Skolnik E (2017). Autism spectrum and social pragmatic language disorders In Goldstein S & DeVries M (Eds.), *Handbook of DSM-5 disorders in children and adolescents* (pp. 377–398). Springer, Cham.
- Mandell DS, Novak MM, & Zubritsky CD (2005). Factors associated with age of diagnosis among children with autism spectrum disorders. *Pediatrics*, 116(6), 1480–1486. [PubMed: 16322174]
- Mandell D, Lawer L, Branch K, Brodtkin E, Healey K, Witalec R, ... Gur R (2012). Prevalence and correlates of autism in a state psychiatric hospital. *Autism*, 16(6), 557–567. [PubMed: 21846667]
- Mandell DS, Listerud J, Levy SE, & Pinto-Martin JA (2002). Race differences in the age at diagnosis among Medicaid-eligible children with autism. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41(12), 1447–1453. [PubMed: 12447031]
- Matson JL (Ed.). (2016). *Handbook of assessment and diagnosis of autism spectrum disorder*. Cham: Springer.
- Mattila M-L, Hurtig T, Haapsamo H, Jussila K, Kuusikko-Gauffin S, Kielinen M, ... Moilanen I (2010). Comorbid psychiatric disorders associated with Asperger Syndrome/high-functioning autism: A community- and clinic-based study. *Journal of Autism and Developmental Disorders*, 40(9), 1080–1093. [PubMed: 20177765]
- McDermott S, Zhou L, & Mann J (2008). Injury treatment among children with autism or pervasive developmental disorder. *Journal of Autism and Developmental Disorders*, 38(4), 626–633. [PubMed: 17690968]
- McElhanon BO, McCracken C, Karpen S, & Sharp WG (2014). Gastrointestinal symptoms in autism spectrum disorder: A meta-analysis. *Pediatrics*, 133(5), 872–83. [PubMed: 24777214]
- McNally Keehn RH, Lincoln AJ, Brown MZ, & Chavira DA (2013). The Coping Cat Program for children with anxiety and autism spectrum disorder: A pilot randomized controlled trial. *Journal of Autism & Developmental Disorders*, 43(1), 57–67. doi:10.1007/s10803-012-1541-9 [PubMed: 22588377]
- McPartland J, Dawson G, Webb SJ, Panagiotides H, & Carver LJ (2004). Event-related brain potentials reveal anomalies in temporal processing of faces in autism spectrum disorder. *Journal of Child Psychology and Psychiatry*, 45(7), 1235–1245. 10.1111/j.1469-7610.2004.00318.x [PubMed: 15335344]
- Mehtar M, & Mukaddes NM (2011). Posttraumatic stress disorder in individuals with diagnosis of autistic spectrum disorders. *Research in Autism Spectrum Disorders*, 5(1), 539–546
- Meilleur AAS, Jelenic P, & Mottron L (2015). Prevalence of clinically and empirically defined talents and strengths in autism. *Journal of autism and developmental disorders*, 45(5), 1354–1367. [PubMed: 25374134]
- Mevissen-Renckens EHM, & de Jongh A (2010). PTSD and its treatment in people with intellectual disabilities: a review of the literature. *Clinical Psychology Review*, 30(3), 308–316. doi:10.1016/j.cpr.2009.12.005 [PubMed: 20056303]
- Meyer BJ, Gardiner JM, & Bowler DM (2014). Directed forgetting in high-functioning adults with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 44(10), 2514–2524. [PubMed: 24722763]
- Minshew NJ, Meyer J, & Goldstein G (2002). Abstract reasoning in autism: A disassociation between concept formation and concept identification. *Neuropsychology*, 16(3), 327. [PubMed: 12146680]
- Myles BS, & Southwick J (1999). *Asperger Syndrome and difficult moments: Practical solutions for tantrums, rage, and meltdowns*. Autism Asperger Publishing, P.O. Box 23173, Shawnee Mission, KS.
- Nemiah JC, Freyberger H, & Sifneos PE (1976). Alexithymia: A view of the psychosomatic process In Hill OW (Ed.), *Modern trends in psychosomatic medicine* (Vol. 3, pp. 430–439). London: Butterworths.

- Newschaffer CJ, Croen LA, Daniels J, Giarelli E, Grether JK, Levy SE, ... Windham GC (2007). The epidemiology of autism spectrum disorders. *Annual Review of Public Health*, 28, 235–258.
- Ornoy A, Weinstein-Fudim L, & Ergaz Z (2015). Prenatal factors associated with autism spectrum disorder (ASD). *Reproductive Toxicology*, 56, 155–169. [PubMed: 26021712]
- Osterling J, & Dawson G (1994). Early recognition of children with autism: A study of first birthday home videotapes. *Journal of autism and developmental disorders*, 24(3), 247–257. [PubMed: 8050980]
- Ozonoff S, Pennington BF, & Rogers SJ (1990). Are there emotion perception deficits in young autistic children?. *Journal of Child Psychology and Psychiatry*, 31(3), 343–361. [PubMed: 2318918]
- Ozonoff S, Young GS, Carter A, Messinger D, Yirmiya N, Zwaigenbaum L, ... Stone WL (2011). Recurrence risk for autism spectrum disorders: A Baby Siblings Research Consortium Study. *Pediatrics*, 128(3), E488–95. [PubMed: 21844053]
- Parker D, & Kamps D (2011). Effects of task analysis and self-monitoring for children with autism in multiple social settings. *Focus on Autism and Other Developmental Disabilities*, 26(3), 131–142.
- Pelphrey KA, Morris JP, McCarthy G, & LaBar KS (2007). Perception of dynamic changes in facial affect and identity in autism. *Social Cognitive and Affective Neuroscience*, 2(2), 140–149. 10.1093/scan/nsm010 [PubMed: 18174910]
- Pennington B, & Ozonoff S (1996). Executive functions and developmental psychopathology. *Journal of Child Psychology and Psychiatry*, 37(1), 51–87. [PubMed: 8655658]
- Polimeni MA, Richdale AL, & Francis AJP (2005). A survey of sleep problems in autism, Asperger's Disorder and typically developing children. *Journal of Intellectual Disability Research*, 49(4), 260–268. [PubMed: 15816813]
- Premack D, & Woodruff G (1978). Does the chimpanzee have a theory of mind?. *Behavioral and Brain Sciences*, 1(4), 515–526.
- Raz R, Roberts A, Lyall K, Hart J, Just A, Laden F, & Weisskopf M (2015). Autism spectrum disorder and particulate matter air pollution before, during, and after pregnancy: A nested case-control analysis within the Nurses' Health Study II Cohort. *Environmental Health Perspectives (Online)*, 123(3), 264.
- Reiss S, Levitan G, & Szyszko J (1982). Emotional disturbance and mental retardation: Diagnostic overshadowing. *American Journal of Mental Deficiency*, 86(6), 567–574. [PubMed: 7102729]
- Richdale AL, & Schreck KA (2009). Sleep problems in autism spectrum disorders: Prevalence, nature, & possible biopsychosocial aetiologies. *Sleep Medicine Reviews*, 13(6), 403–411. [PubMed: 19398354]
- Rieffe C, Terwogt MM, & Kotronopoulou K (2007). Awareness of single and multiple emotions in high-functioning children with autism. *Journal of Autism and Developmental Disorders*, 37(3), 455–465. [PubMed: 16868846]
- Reiter S, Bryen DN, & Shachar I (2007). Adolescents with intellectual disabilities as victims of abuse. *Journal of Intellectual Disabilities*, 11(4), 371–387. [PubMed: 18029413]
- Rimland B (1978). Savant capabilities of autistic children and their cognitive implications In Serban G (Ed.), *Cognitive defects in the development of mental illness* (pp. 43–65). Oxford, England: Brunner/Mazel.
- Risch N, Hoffmann TJ, Anderson M, Croen LA, Grether JK, & Windham GC (2014). Familial recurrence of autism spectrum disorder: Evaluating genetic and environmental contributions. *American Journal of Psychiatry*, 171(11), 1206–1213. [PubMed: 24969362]
- Rodgers J, Glod M, Connolly B, & McConachie H (2012). The relationship between anxiety and repetitive behaviours in autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 42(11), 2404–2409. [PubMed: 22527704]
- Rogers SJ, Hepburn S, & Wehner E (2003). Parent reports of sensory symptoms in toddlers with autism and those with other developmental disorders. *Journal of Autism and Developmental Disorders*, 33(6), 631–42. [PubMed: 14714932]
- Ropar D, & Peebles D (2007). Sorting preference in children with autism: The dominance of concrete features. *Journal of Autism and Developmental Disorders*, 37(2), 270–280. [PubMed: 16897382]

- Rose V, Trembath D, Keen D, & Paynter J (2016). The proportion of minimally verbal children with autism spectrum disorder in a community-based early intervention programme. *Journal of Intellectual Disability Research*, 60(5), 464–477. [PubMed: 27120989]
- Rutter M, Andersen-Wood L, Beckett C, Brendekamp D, Castle J, Groothues C, ... O'Connor TG (1999). Quasi-autistic patterns following severe early global privation. *Journal of Child Psychology and Psychiatry*, 40(A), 537–549. [PubMed: 10357161]
- Scheeringa MS, Salloum A, Arnberger RA, Weems CF, Amaya-Jackson L, & Cohen JA (2007). Feasibility and Effectiveness of Cognitive-Behavioral Therapy for Posttraumatic Stress Disorder in Preschool Children: Two Case Reports. *Journal of Traumatic Stress* 20(4), 631–636. [PubMed: 17721975]
- Sasson NJ, Elison JT, Turner-Brown LM, Dichter GS, & Bodfish JW (2011). Brief report: Circumscribed attention in young children with autism. *Journal of Autism and Developmental Disorders*, 41(2), 242–247. [PubMed: 20499147]
- Schaefer G (2016). Clinical genetic aspects of ASD Spectrum Disorders. *International Journal of Molecular Sciences*, 17(2), 180.
- Scheeringa MS, Weems CF, Cohen JA, Amaya-Jackson L, & Guthrie D (2011). Trauma-Focused Cognitive-Behavioral Therapy for posttraumatic stress disorder in three-through six year-old children: A randomized clinical trial. *Journal of Child Psychology and Psychiatry*, 52(8), 853–860. [PubMed: 21155776]
- Shalom DB, Mostofsky SH, Hazlett RL, Goldberg MC, Landa RJ, Faraon Y, ... 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*, 35(3), 395–400.
- Schopler E, & Mesibov GB (Eds.). (2013). *Learning and cognition in autism*. Springer Science & Business Media.
- Shulman C, Yirmiya N, & Greenbaum CW (1995). From categorization to classification: A comparison among individuals with autism, mental retardation, and normal development. *Journal of Abnormal Psychology*, 104, 601–609. [PubMed: 8530762]
- Silani G, Bird G, Brindley R, Singer T, Frith C, & Frith U (2008). Levels of emotional awareness and autism: An fMRI study. *Social Neuroscience*, 3(2), 97–112. [PubMed: 18633852]
- Simonoff E, Pickles A, Charman T, Chandler S, Loucas T, & Baird G (2008). Psychiatric disorders 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. [PubMed: 18645422]
- Sofronoff K, Attwood T, & Hinton S (2005). A randomised controlled trial of CBT intervention for anxiety in children with Asperger syndrome. *Journal of Child Psychology and Psychiatry*, 46(11), 1152–1160. [PubMed: 16238662]
- Sofronoff K, Attwood T, Hinton S, & Levin I (2007). A randomized controlled trial of a cognitive behavioural intervention for anger management in children diagnosed with Asperger Syndrome. *Journal of Autism and Developmental Disorders*, 37(7), 1203–1214. [PubMed: 17082978]
- Solomon M, Bauminger N, & Rogers SJ (2011). Abstract reasoning and friendship in high functioning preadolescents with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 41(1), 32–43. [PubMed: 20467797]
- Souders M, Mason T, Valladares O, Bucan M, Levy S, Mandell D, ... Pinto-Martin J (2009). Sleep behaviors and sleep quality in children with autism spectrum disorders. *Sleep*, 32(12), 1566–78. [PubMed: 20041592]
- Soulières I, Dawson M, Samson F, Barbeau EB, Sahyoun CP, Strangman GE, ... Mottron L (2009). Enhanced visual processing contributes to matrix reasoning in autism. *Human Brain Mapping*, 30(12), 4082–4107. [PubMed: 19530215]
- South M, Ozonoff S, & McMahon WM (2005). Repetitive behavior profiles in Asperger syndrome and high-functioning autism. *Journal of Autism and Developmental Disorders*, 35(2), 145–158. [PubMed: 15909401]
- Spratt EG, Nicholas JS, Brady KT, Carpenter LA, Hatcher CR, Meekins KA, ... Charles JM (2012). Enhanced cortisol response to stress in children with autism. *Journal of Autism and Developmental Disorders*, 42(1), 75–81. [PubMed: 21424864]

- Stadnick N, Chlebowski C, & Brookman-Frazee L (2017). Caregiver-teacher concordance of challenging behaviors in children with autism spectrum disorder served in community mental health settings. *Journal of Autism and Developmental Disorders*, 47(6), 1780–1790. [PubMed: 28343342]
- Steensel F, Bögels J, & Perrin A (2011). Anxiety disorders in children and adolescents with autistic spectrum disorders: A meta-analysis. *Clinical Child and Family Psychology Review*, 14(3), 302–317. [PubMed: 21735077]
- Sterzing P, Shattuck P, Narendorf S, Wagner M, & Cooper B (2012). Bullying involvement and autism spectrum disorders: Prevalence and correlates of bullying involvement among adolescents with an autism spectrum disorder. *Archives of Pediatrics & Adolescent Medicine*, 166(11), 1058–1064. [PubMed: 22945284]
- Storch EA, Sulkowski ML, Nadeau J, Lewin AB, Arnold EB, Mutch PJ, ... Murphy TK (2013). The phenomenology and clinical correlates of suicidal thoughts and behaviors in youth with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 43(10), 2450–2459. [PubMed: 23446993]
- Sullivan PM, & Knutson JF (2000). Maltreatment and disabilities: A population-based epidemiological study. *Child Abuse and Neglect*, 24, 1257–1273. doi:10.1016/S0145-2134(00)00190-3 [PubMed: 11075694]
- Sung M, Ooi YP, Goh TJ, Pathy P, Fung DS, Ang RP, ... Lam CM (2011). Effects of cognitive-behavioral therapy on anxiety in children with autism spectrum disorders: A randomized controlled trial. *Child Psychiatry & Human Development*, 42(6), 634–649. doi:10.1007/s10578-011-0238-1 [PubMed: 21660428]
- Tager-Flusberg H (2007). Evaluating the Theory-of-Mind Hypothesis of Autism. *Current Directions in Psychological Science*, 16(6), 311–315.
- Tchacouas A, & Adesman A (2013). Autism spectrum disorders: A pediatric overview and update. *Current Opinion in Pediatrics*, 25(1), 130–144. [PubMed: 23274432]
- Tissot C, & Evans R (2003). Visual teaching strategies for children with autism. *Early Child Development and Care*, 173(4), 425–433.
- Toichi M, & Kamio Y (2003). Long-term memory in high-functioning autism: Controversy on episodic memory in autism reconsidered. *Journal of Autism and Developmental Disorders*, 33(2), 151–161. [PubMed: 12757354]
- Tuchman R, & Rapin I (2002). Epilepsy in autism. *Lancet Neurology*, 1(6), 352–358. [PubMed: 12849396]
- Valenti M, Ciprietti T, Egidio C, Gabrielli D, Masedu M, Tomassini F, & Sorge A (2012). Adaptive response of children and adolescents with autism to the 2009 earthquake in L'Aquila, Italy. *Journal of Autism and Developmental Disorders*, 42(6), 954–960. [PubMed: 21717269]
- Valicenti-McDermott M, Hottinger K, Sejo R, & Shulman L (2012). Age at diagnosis of autism spectrum disorders. *Journal of Pediatrics*, 161(3), 554–556. [PubMed: 22683037]
- Volden J, Coolican J, Garon N, White J, & Bryson S (2009). Brief report: pragmatic language in autism spectrum disorder: Relationships to measures of ability and disability. *Journal of Autism and Developmental Disorders*, 39(2), 388–393. [PubMed: 18626760]
- Volk H, Lurmann F, Penfold B, Hertz-Picciotto I, & McConnell R (2013). Traffic-related air pollution, particulate matter, and autism. *JAMA Psychiatry*, 70(1), 71–77. [PubMed: 23404082]
- Webb SJ, Neuhaus E, & Faja S (2017). Face perception and learning in autism spectrum disorders. *The Quarterly Journal of Experimental Psychology*, 70(5), 970–986. [PubMed: 26886246]
- White SJ, Frith U, Rellecke J, Al-Noor Z, & Gilbert SJ (2014). Autistic adolescents show atypical activation of the brain's mentalizing system even without a prior history of mentalizing problems. *Neuropsychologia*, 56, 17–25. doi:10.1016/j.neuropsychologia.2013.12.013. [PubMed: 24361475]
- White SW, Mazefsky CA, Dichter GS, Chiu PH, Richey JA, & Ollendick TH (2014). Social-cognitive, physiological and neural mechanisms underlying emotion regulation impairments: Understanding anxiety in autism spectrum disorder. *International Journal of Developmental Neuroscience*, 39, 22–36. [PubMed: 24951837]

- Wigham S, Hatton C, & Taylor JL (2011). The Lancaster and Northgate Trauma Scales (LANTS): The development and psychometric properties of a measure of trauma for people with mild to moderate intellectual disabilities. *Research in Developmental Disabilities: A Multidisciplinary Journal*, 32(6), 2651–2659.
- Williams BT, & Gray KM (2013). The relationship between emotion recognition ability and social skills in young children with autism. *Autism*, 17(6), 762–768. [PubMed: 23175751]
- Wimmer H, & Perner J (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*, 13(1), 103–128. [PubMed: 6681741]
- Wong C, Odom SL, Hume K, Cox AW, Fettig A, Kucharczyk S, ...Schultz TR (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders*, 45(7), 1951–1966. [PubMed: 25578338]
- Wood JJ, Drahota A, Sze K, Har K, Chiu A, & Langer DA (2009). Cognitive behavioral therapy for anxiety in children with autism spectrum disorders: A randomized, controlled trial. *Journal of Child Psychology and Psychiatry*, 50(3), 224–234. [PubMed: 19309326]
- Wood JJ, Ehrenreich-May J, Alessandri M, Fujii C, Renno P, Laugeson E, ... Storch EA (2015). Cognitive behavioral therapy for early adolescents with autism spectrum disorders and clinical anxiety: A randomized, controlled trial. *Behavior Therapy*, 46(1), 7–19. [PubMed: 25526831]
- Wood JJ, & Gadow KD (2010). Exploring the nature and function of anxiety in youth with autism spectrum disorders. *Clinical Psychology: Science and Practice*, 17, 281–292. doi:10.1111/j.1468-2850.2010.01220.x.
- Yeargin-Allsopp M, Rice C, Karapurkar T, Doernberg N, Boyle C, & Murphy C (2003). Prevalence of autism in a US metropolitan area. *JAMA*, 289(1), 49–55. doi:10.1001/jama.289.1.49 [PubMed: 12503976]
- Yehuda R (2001). Biology of posttraumatic stress disorder. *Journal of Clinical Psychiatry*, 62, 41–46.