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The Use of Clinical Judgment in Differentiating Symptoms of Autism Spectrum

Disorder From Those of Other Childhood Conditions: A Delphi Study

A Dissertation

Presented to

the Faculty of the Morgridge College of Education

University of Denver

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In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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by

Staci Jordan

June 2019

Advisor: Dr. Devadrita Talapatra

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Author: Staci Jordan

Title: The Use of Clinical Judgment in Differentiating Symptoms of Autism Spectrum Disorder From Those of Other Childhood Conditions: A Delphi Study

Advisor: Dr. Devadrita Talapatra

Degree Date: June 2019

### Abstract

More and more, due to long waiting lists at diagnostic clinics and access barriers for certain segments of the population, schools are often the first environment in which children are evaluated for ASD (Sullivan, 2013). And while accurate identification of autism spectrum disorders (ASD) is essential for proper treatment and service provision, large percentages of school and community-based identifications of ASD are overturned when children are re-evaluated with strict clinical criteria (Wiggins et al., 2015). In part, challenges faced in accurately differentiating ASD from other conditions may be contributed to the diagnostic complexities of the condition itself. Clinical expertise is one of, if not the most important factors in accurate diagnostic decision-making during evaluations of ASD. However, there exists little insight into what comprises this expert judgment.

Using the Delphi methodology, a panel of clinical and school psychology experts in ASD identification were surveyed until consensus was reached about their use of clinical judgment in differentiating ASD from other conditions. The results of these rounds of questioning were compiled into a decision-making guideline entitled "*Beyond Test Results: Developing Clinical Judgment to Differentiate Symptoms of Autism Spectrum Disorders from Those of Other Childhood Conditions.*" Implications of this

guide include incorporation into school psychology training courses and guidance for school-based evaluation teams.

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## Chapter 1: Introduction

I met James when he was in the 4<sup>th</sup> grade and a transfer to our center-based autism program from another center in the district. Our first encounter was memorable for how he stood out from the rest of the students in the classroom in a way I couldn't quite put my finger on. James used and understood gestures, was sensitive to the perspective of others, and his fixation on certain computer games seemed to stem from the ability it lent him to connect with others, rather than from a place of perseveration and inflexibility. The more I got to know James, the more I wondered if he truly had autism.

Upon digging into his educational history, I discovered that James was initially evaluated in preschool and due to behavioral challenges and a severe speech and language disorder, he was provided with special education services. His evaluation team determined that a general education classroom would not be a good fit, and as it was the only other option at the time, decided to place him in a classroom for children with Autism Spectrum Disorders (ASD). James was re-evaluated three years later, and given his scores on limited ASD-specific assessment tools, he met educational criteria for ASD and remained in center-based programming from that day forward. When he came to us in the 4<sup>th</sup> grade, the world of autism was all he knew; James had very limited opportunities to interact with typically developing peers and spent his day with children with the linguistic, communicative, social, and behavioral characteristics of ASD. He was used to a classroom environment that was highly structured; every minute of his day was

scheduled, and his learning tasks were broken down into small components and taught in a step-by-step manner. At times, even his social interactions were scripted and reinforced.

When completing his next re-evaluation, I discovered that though his early social development was typical, seven years of immersion in the world of autism had left James with awkward social interactions and a hard time engaging in open-ended, non-structured activities. Upon a review of the assessment data, it was clear that James did not have ASD, but instead a severe speech and language disorder. In the fifth grade, he was placed into a general education classroom with significant support for academics, language, and social skills. However, James experienced significant anxiety and frustration and when he did come to school, he had frequent meltdowns. Eventually, with the help of a 1:1 paraprofessional and fading support from the ASD classroom, James' frustration and anxiety improved; he made friends and gained academic skills. Though he made improvements after his learning needs were properly classified, those closest to him were left to wonder where he would be now if he was never misidentified in the first place.

### **ASD Evaluation in the School Setting**

Accurate diagnosis of autism spectrum disorders (ASD) is essential for proper treatment and service provision (Eldevik et al., 2009; Rotholz, Kinsman, Lacy, & Charles, 2017; Volkmar, 2014). More and more, due to long waiting lists at diagnostic clinics and access barriers for certain segments of the population, schools are often the first environment in which children are evaluated for ASD (Kremen, 2013; Parikh, Kurzuis-Spencer, Mastergrove, & Pettygrove, 2018; Sullivan, 2013). However, with increasing diversity of student needs, there is pressure for educational diagnosticians,

such as school psychologists, to have a wide breadth of general knowledge at the expense of specialized expertise; possibly limiting the diagnostic capabilities of schools (Miller, Maricle, & DeOrnellas, 2009; Reynolds, 2011). Additional factors schools face such as limited resources for specialized assessment tools, systemic pressures to provide certain diagnoses, and decision-making biases of assessment teams may further cloud diagnostic certainty. In fact, large percentages of school and community-based identifications of ASD are overturned when re-evaluated with strict clinical criteria (Kosofsky et al., 2018; Wiggins et al., 2015; Williams, Atkins, & Soles, 2009). In part, the challenges faced in accurately differentiating ASD from other conditions may be contributed to the diagnostic complexities of the condition itself.

### **Diagnostic Complexities of ASD**

Thornton (2013) in his description of the complexities of psychiatric diagnosis stated the following:

The concepts of specific symptoms are, despite their specificity, general concepts that can be instantiated in an unlimited number of actual or potential cases. So how can one judge that a general concept applies to a specific individual case or individual person? How can one recognize that the individual exemplifies a type? (p. 1058)

These words seem to hold especially true for the myriad of qualitative and behavioral symptoms embodied in the ASD phenotype. The terminologies that describe ASD symptomology are highly subjective in nature and it is often a subtle qualitative difference that can differentiate between an indicator of ASD and that of another condition. Additionally, many conditions other than ASD may be present in, mimic, intensify, and/or be intensified by ASD, and contribute to diagnostic confusion. Further complicating this matter is the inadequacy of the most popular and readily available ASD

screening tools in accurately identifying ASD and ruling out alternative conditions (Cholemkey, Mojica, Rohrmann, Gensthaler, & Freitag, 2014; Hus, Bishop, Gotham, Huerta, & Lord, 2013; Moody et al., 2017). Finally, a dearth of educational classification guidelines as well as variability in qualification criteria from state to state can make the task of accurate identification of ASD even more daunting (Barton et al., 2016). In sum, it is apparent that a certain level of expertise may be necessary to sort through the above complexities.

### **The Role of Clinical Expertise in ASD Identification**

One cannot rely on test scores alone to determine whether the constellation of a student's symptoms is due to ASD or another condition (Reaven, Hepburn, & Ross, 2008; Saulnier, 2016). Rather, it is a combination of test scores, developmental history, careful observations, and most importantly "clinical expertise" that leads to the most accurate diagnosis (Betan & Binder, 2010; Saulnier, 2016; Thornton, 2013; Wiggins et al., 2015). Similar terminology is used to describe the symptoms of multiple conditions, with the expectation that the examiner will be able to differentiate subtle qualitative differences in presentation. Often, the difference between a social problem (for example lack of eye contact) resulting from ASD and the same problem resulting from another condition is something an expert in ASD just *knows*, but cannot quantify through formal testing (Thornton, 2013). This intuition, when employed by experts and validated through analytical reasoning, limits many of the heuristic and process-based errors that novices make (Lucchiari & Pravettoni, 2012; Luchins, 2012; Ruedinger, Olson, Yee, Borman-Shoap, & Olson, 2017; Thammasitboon & Cutrer, 2013). However, school-based

practitioners often have professional requirements that require generalized knowledge (Miller et al., 2009; Reynolds, 2011). As such, the training, literature, and experience that leads to the sort of expertise needed to understand the diagnostic complexities of ASD may be rare in school settings (Allen, Robins, & Decker, 2008; McClain, Otero, Haverkamp, & Molsberry, 2018). When school-based evaluation teams lack this diagnostic expertise, specialized supports may be vital to classification accuracy.

### **Statement of the Problem**

Clinical judgment is an integral component of ASD diagnosis and differential decision-making (Saulnier, 2016; Wiggins et al., 2015). Though there are models of clinical judgment that focus on clinical behaviors, the cognitive process of clinical judgment during diagnostic decision-making is not clearly defined (Adamson, Gubrud, Sideras, & Lasater, 2012; Betan & Binder, 2010; Tanner, 2006). The purpose of this study was to illuminate this clinical judgment in such a way that school-based teams, who may be lacking in such expertise, may be able to use the information to make more sound diagnostic decisions when attempting to differentiate ASD from other conditions.

Tools such as cognitive maps, checklist, and other non-directional guidelines are helpful in diagnostic decision-making; particularly when the decision-makers lack expertise in the specific diagnoses in question (Lucchiari & Pravettoni, 2012; Reudinger, Olson, Yee, Borman-Shoap, & Olson, 2017; Thammastiboon & Cutrer, 2013). Such tools can limit human error, reduce instances of bias, and help diagnosticians consider alternate hypotheses and symptom origin (Graber, 2009; Lucchiari & Pravettoni, 2012; Reudinger, et al., 2017; Thammastiboon & Cutrer, 2013). To date, there are no diagnostic decision-



making supports that illuminate clinical expertise readily available to school teams. Furthermore, texts geared toward school-based assessment tend to be written by school-based experts and collaboration between clinical and educational experts to develop assessment guidelines seems to be rare.

The decision-making guide developed in this study will be of particular use to school-based assessment teams who lack expertise in the diagnosis of autism spectrum disorder. School professionals such as school psychologists will be able to use this guidebook to help them examine the myriad of observed symptoms and test results and determine to which condition these symptoms are most likely attributed.

### **Purpose of Study**

This study sought to illuminate the clinical judgment of clinical and school-based experts in the field of ASD identification and diagnosis (hereby referred to as “experts”) when engaging in diagnostic decision-making. In particular, I examined the critical period between receiving a referral for an evaluation of a child with suspected ASD and ultimately deciding to continue evaluating for ASD, or to evaluate an alternate condition such as ADHD, nonverbal learning disability (NVLD), intellectual disability (ID), or mood disorder.

Using the Delphi method of iterative questioning, an expert panel was surveyed until they reached consensus regarding the use of clinical expertise in diagnostic decision-making. One goal of reaching consensus was to mitigate the gap between educational and clinical decision-making as it pertained to diagnostic decision-making during evaluations for ASD. Of special concern were the “red flags” that initiate the use

of clinical judgment in suspecting an alternate condition, the process by which experts determine if a student's difficulties are attributed to ASD or another condition, and the sources of data experts use to confirm or dismiss their intuition. The information obtained through reaching expert consensus was given form through the development of tables and cognitive maps. An anticipated use for the tables and cognitive maps developed in this study is to enhance the assessment training of school psychologists by helping them to understand how experts conceptualize symptom differentiation (Hassan, 2013). These cognitive maps may also be used in conjunction with analytical decision-making supports to develop decision-making guidebooks for school-based teams.

### **Research Questions**

To assist school teams who may lack clinical expertise yet are still in a position of providing an educational diagnosis, this study sought to illuminate experts' clinical *knowingness* and identify the decision-making factors that experts agree are the most important in differentiating the symptoms of ASD from those of other related conditions during school-based evaluations. For this study, the overarching question was to explore how clinical and school-based experts in the field of ASD evaluation use clinical judgment in the process of differentiating ASD from other conditions. To determine the process, the following questions were posed:

1. What characteristics do experts agree are most important to consider when using clinical judgment to determine if an individual has ASD?
2. How do experts use clinical judgment to decide whether the aforementioned characteristics are attributed to ASD or to another condition?

3. What sources of information do experts use to confirm or reject their clinical judgment in the process of diagnostic decision-making?

## Chapter 2: Review of the Literature

### Symptom Interpretation and Differentiation

As evidenced by the criteria put forth by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V; American Psychiatric Association [APA], 2013), the Individuals with Disabilities Education Act (IDEA, 2004), and literature regarding extended phenotypic indicators, the symptom terminologies of ASD are highly qualitative and ambiguous in nature. It can be easy to see that a teacher or school psychologist with limited experience may interpret any of these symptoms in several different ways. Take for example, the “red flag” presented in the Colorado Department of Education (CDE) ASD evaluation guidebook: “*Doesn't show a range of emotions*” (CDE, Exceptional Student Services Unit [CDE-ESSU], 2015, p. 8). This symptom as interpreted by one individual could mean persistent sadness, whereas another individual may interpret it as persistent happiness, and yet another as a socially reserved personality. For an expert highly experienced and trained in researching, assessing, or diagnosing ASD, even the subtlest individual differences in symptom presentation can be obvious. A novice evaluator, however, may have difficulty applying ASD-specific nuances to individual cases. For instance, the symptom *difficulty maintaining relationships* could be due to an ASD-specific lack of understanding of the perspectives of others, or due to shyness, bullying, anxiety, depression, hygiene, or behavioral challenges. Whereas an expert in ASD evaluation may be able to clearly see the differences in presentation, a

novice may not. Table 1 illustrates further examples of possible symptom misinterpretations.

Table 1  
*Examples of Potential Diagnostic Confusion in ASD*

Symptom	Potential Causes Other Than ASD
Unusual eye contact	Anxiety, distractibility, insecurity, shame, depression, cultural variations, trauma
Limited joint attention	Intellectual disability, poor attention, distractibility, adult has difficulty eliciting joint attention, child is gifted and not interested, fear of joint stimuli, social anxiety or shyness
All-consuming interests	Personal strength in certain topic, intellectually gifted, fad amongst peers, strong family interest, Obsessive-Compulsive Disorder
Poor theory of mind	Intellectual disability, language delay, executive functioning challenges

**Distinguishing ASD from other conditions.** A key aspect of any thorough developmental evaluation is considering both comorbidities and differential diagnoses. However, due to symptom overlap and ambiguity, this can be one of the most challenging aspects of a clinical or educational diagnostician's job. Accurately labeling the disability behind a child's symptoms while ruling out disabilities that are not a good fit is a key component of every clinical and school-based diagnostician's job (Davis, White, & Ollendick, 2014; National Collaborating Centre for Women's and Children's Health [NICE], 2011; Volkmar, Paul, Rogers, & Pelphrey, 2014). Clinical and educational texts point to certain disabilities that share symptoms with ASD and which should be ruled in or out when evaluating for ASD in children (Davis et al., 2014; First, 2014; Kroncke, Willard, Huckabee, & Reinhardt, 2016; NICE, 2011; Saulnier & Ventola, 2012). The exceptionalities that appear most often in clinical literature as potential differentials for ASD include: ADHD, anxiety disorders (including selective mutism, generalized anxiety

disorder [GAD], social anxiety disorder [SAD], and obsessive compulsive disorder [OCD]), depressive disorders, behavioral disorders, speech and language impairment, trauma-related disorders, ID, and intellectual giftedness (APA, 2013; Levy et al., 2010; Kroncke et al., 2017; Matson & Williams, 2013; Saulnier & Ventola, 2012).

Emphasis on considering differentials at case onset and throughout the evaluation process appears to be unique to the clinical and medical settings. Colorado is an example of one state with internet-available ASD evaluation guidelines that does prompt school teams to categorize assessment data into those consistent with ASD and those not (CDE-ESSU, 2015). However, in an extensive search of school-based handbooks, guidebooks, and other publications, I found no mention of considering differential IDEA (2004) categories, though some of the publications did discuss similar differential conditions as those found in clinical literature (Clark, Radley, & Phosaly, 2014; Dowdy, Mays, Kamphaus, & Reynolds, 2009; Goldstein, Naglieri, & Ozonoff, 2009; Harrison & Thomas, 2014).

In one widely-used text, *Foundations of Behavioral, Social, and Clinical Assessment of Children, Sixth Edition* (Sattler, 2014), the reader is encouraged to focus their assessment on answering the referral question. In an ASD assessment chapter in another popular school psychology volume, the authors suggest that if final evaluation results are not consistent with ASD, the student should re-enter a response to intervention model rather than considering differentials from referral onset (Clark et al., 2014). Finally, in a third school-based evaluation handbook published in 2017, the reader is told that differentiating ASD from other conditions is an important task, but is offered no

advice on how to do so (Wilkinson, 2017). Overall, it is fair to say that a majority of school-focused ASD identification texts and guidelines share a focus on determining whether a child meets IDEA (2004) eligibility criteria for the category associated with his or her reason for referral.

This lack of guidance in differentiating ASD from other conditions is further compounded by limited research dedicated to ASD assessment in school-based settings. McClain et al. (2018) reviewed 10 well-known school psychology journals and found only 30 articles in the past 10 years that focused on ASD assessment. Resulting from this lack of current research and guidelines and other barriers unique to school settings, school psychologists may be ill prepared to thoroughly evaluate for ASD. In fact, a recent survey of school psychologists suggests that as few as 25% of school psychologists use best practices in their assessments for ASD (Aiello, Ruble, and Esler, 2017).

In addition to limited research availability, the small percentage of school psychologists who report using best practices in their ASD evaluations could be due in part to characteristics unique to schools. These characteristics may include strict legal timelines, lack of access to many diagnostic assessment tools, and generalized professional roles that often include consultation, system-wide supports, and direct student service provision in addition to assessment. Compared to schools, clinical settings may have access to a variety of specialty assessments, a more lenient timeline, and practitioners who specialize in diagnostic evaluation. Overall, it is possible that school-based practitioners encounter many barriers in training, guidance, and resources that may

hinder their ability to conduct thorough evaluations for ASD. One of these barriers could be the difference between clinical criteria and those outlined in IDEA (2004).

According to IDEA (2004), a child may qualify for special education under one primary disability category, but if they have educational needs that are not addressed under that category they can qualify for multiple secondary disabilities. For instance, a child whose primary disability is determined to be ASD, but who also has significant behavioral, emotional, and speech and language challenges that are not characteristic of ASD can have secondary disabilities of Emotional Disability (ED) and Speech and Language Impairment (SLI). There are no set rules in IDEA (2004) as far as determining which disability is primary and which is secondary; this is something that is generally discussed and decided upon as a team, which includes parents, general and special education teachers, and specialized instructional support personnel (SISPs). Factors that may influence team decision of primary disability and lead to potential misidentification may include placement desires, parent, teacher, or administration pressure, or confirmation bias. Failure to consider clinical diagnostic criteria and instead focusing solely on eligibility criteria could further confound accurate disability identification.

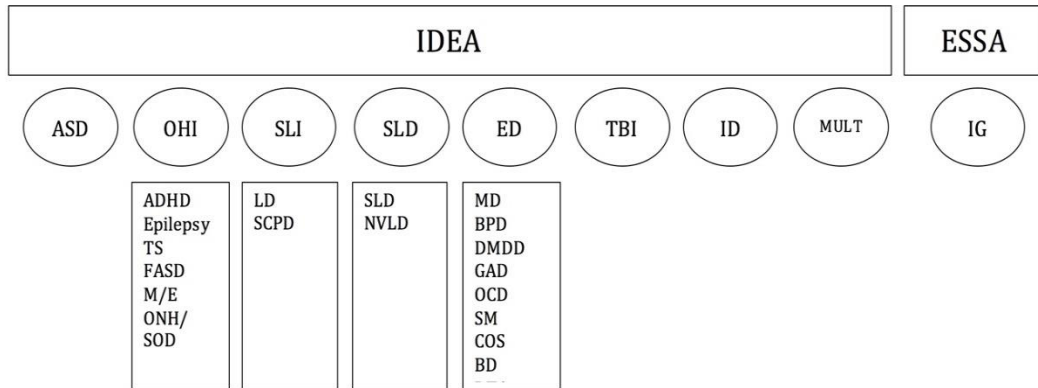
Though some argue that diagnosis is not a school's responsibility and that the role of school-based assessment teams should end at eligibility, this paper takes the stance of Dowdy et al. (2009) and others who believe that it is the responsibility of school psychologists to form diagnostic impressions of students in order to improve communication between systems and inform evidence-based interventions. For instance, saying "Sally has characteristics of a social anxiety disorder" rather than "Sally has an



emotional disability” when communicating with a school psychologist at a child’s new school is likely to enhance communication (Dowdy et al., 2009). Operating under these assumptions, both the clinical and educational criteria and symptomology for diagnoses will be discussed. However, because the aim of this study is to provide guidance to school based teams, IDEA (2004) categories will be used as an organizational structure.

There are thirteen IDEA (2004) categories under which a student may qualify for special education services. Those categories are: ASD, Blindness, Deaf-Blindness, Deafness, ED, Hearing Impairment, ID, Multiple Disabilities, Orthopedic Impairment, Other Health Impairment (OHI), Specific Learning Disability (SLD), SLI, and Traumatic Brain Injury (TBI). For the purposes of this paper, Blindness, Deafness, Deaf-Blindness, Hearing Impairment, and Orthopedic Impairment will be excluded due to both specific “hard” eligibility criteria (Pennington, 2008) that needs to be assessed by an audiologist, vision specialist, or motor specialist and a lack of support in the literature as common differential disabilities for ASD. However, it should be noted that children with visual impairments may show “blindisms” (Fink & Borchert, 2011) that tend to mimic some characteristics of ASD. Though no mention of TBI as a differential for ASD was found in the sources reviewed above, there is emerging evidence that brain injury in certain neurological regions can lead to the development of ASD-like symptoms (Buxbaum & Hof, 2013; Singh et al., 2016), so it will be included in this discussion. Gifted and Talented (GT) is an exceptionality that is not covered by IDEA (2004) rules and regulations; however, the Every Student Succeeds Act of 2015 (ESSA), mandates schools that receive Title I and II funds to identify and provide services to gifted and talented

students. Due to shared symptomology with ASD, as well as the professional obligation of school psychologists to identify individuals who are GT, GT will be included in this discussion. *Figure 1* provides a visual representation of how clinical disabilities will be organized under IDEA (2004) and ESSA (2015) categories.



*Figure 1.* Organizational structure of differential exceptionalities.

Careful understanding of the symptomology associated with differential conditions for ASD is crucial to providing the best services to children, families, teachers, policy makers, and researchers (Esler & Ruble, 2015; Gensler, 2012; Metzger, Simpson, & Bakken, 2009; Pennington, 2008). Children who are improperly classified may receive special education services that are inappropriate to meet their educational needs. For instance, a student who is mistakenly provided with an ASD label may be placed in center programming specific to children with ASD and miss out on naturalistic social learning opportunities with neurotypical peers and access to general education curriculum (Metzger et al., 2009). If a child’s diagnosis is overturned clinically, families may lose trust with the school (Esler & Ruble, 2015; Metzger et al., 2009; Pennington, 2008). Some studies indicate that teacher burnout increases when efforts with students lead to

little or no growth, which may be the case if using an inappropriate intervention with a student who has been mislabeled (Metzger et al., 2009). Finally, policy makers and researchers rely on accurate classification and identification of students; mislabeling can lead to inappropriate allocation of funding and reduce the validity of research results (Dowdy et al., 2009; Esler & Ruble, 2015). To prevent many of the challenges listed above, school-based diagnosticians must first increase their ability to accurately differentiate between childhood conditions. Accurate differentiation begins with an understanding of commonalities and distinguishing features. Next is a discussion of the core and related symptomology of ASD followed by the shared and distinguishing characteristics of several related childhood conditions.

### **Symptom Terminology: ASD and Related Conditions**

**Autism spectrum disorders.** To understand the diagnostic confusion that occurs when differentiating ASD from other disabilities, one must first understand the complexities of ASD itself. The term autism, derived from the Greek term for “self”, was coined by Leo Kanner in 1943 to describe children who appeared aloof, lacking in social awareness, and who gravitated toward a solidarity and routine-based life (Goldstein et al., 2009; Hyman & Levy, 2013). Throughout the years, the clinical and educational diagnostic criteria of ASD have been both refined to distinguish it from intellectual disability and childhood psychosis and expanded to envelop related conditions (Goldstein et al., 2009; Kroncke et al., 2016). Since its inception, interest in the field of ASD has increased dramatically, and dissemination in this area has outpaced publications of all other subjects (Dawson, 2013). Domains of clinical and educational ASD research are

wide reaching and encompass a diversity of topics such as symptomology, etiology, biology, prevalence and diagnosis.

***Clinical definition and terminology.*** According to the diagnostic criteria set forth through the DSM-V, ASD is a complex grouping of social-behavioral characteristics centered around two categories: Social communication difficulties and restricted and repetitive interests and behaviors (RRBs). These categories (a) can range in level of severity, presentation, and associated symptomology, (b) must be observable in multiple contexts, (c) can present during early developmental periods or later in childhood or adolescence as social demands increase, and (d) must not be better explained by either ID or language delay (APA, 2013; Hyman & Levy, 2013). Beyond the definition provided in the DSM-V, expanded phenotypic descriptions are described in ASD literature. Both formal diagnostic criteria and associated phenotypic qualities of ASD found in the literature are described in the following sections.

***Social communication.*** Children with ASD face a myriad of social challenges that can range from a consistent lack of interest in others to difficulties maintaining relationships. While these challenges may improve over time or be more noticeable during unstructured situations, they must be evident in multiple settings for a diagnosis of ASD (APA, 2013; Hyman & Levy, 2013; Ornstein Davis & Carter, 2014). Regardless of verbal language ability, difficulties in social and communicative reciprocity, nonverbal communication, and developing, maintaining, and understanding relationships form the core of social communication difficulties for children with ASD (APA, 2013).

Social and communicative reciprocity describes the verbal or nonverbal ‘give and take’ that typically accompanies social interactions and is the product of two individuals being able to read and respond to the cues of the other. Though reciprocity can be affected in a variety of disorders, in ASD the key indicators stem from limited ability to understand the perspective of others and manifest in unusual eye contact, delayed or absent imitation, difficulty with joint attention, vocal abnormalities, social initiation, and conversation (Hyman & Levy, 2013; Ornstein Davis & Carter, 2014). Nonverbal communication differences include difficulties using communicative gestures, facial expressions, and body language (APA, 2013; Hyman & Levy, 2013; Romero, Fitzpatrick, Roullet, Duncan, Richardson, & Schmidt, 2018). Developing, maintaining, and understanding relationships are the third area of social-communicative disturbance in ASD. Behaviors associated with difficulties understanding and developing relationships can range from complete aloofness to mildly inappropriate social contact and tend to stem from an inability to understand another’s perspective (APA, 2013; Hyman & Levy, 2013). In the most severe cases, individuals with ASD may fail to look at or attend to others, avoid social contact, or even act with aggression when approached (APA, 2013). In more mild instances, individuals may have difficulty approaching or working with others or avoid unstructured social situations such as recess or parties (Bauminger-Zviely, 2013). Table 2 details specific social-communicative symptomology that may be observed in children with ASD.

*Restricted and repetitive patterns of behavior.* In addition to social communication deficits, the diagnostic criteria for ASD includes restricted and repetitive

behaviors (RRBs) (APA, 2013). RRBs encompass a wide spectrum of behaviors including repetitive movements and vocalizations, adherence to routines and rituals, specific and restricted interests, and sensory differences (APA, 2013). Though they are common in other neurodevelopmental disorders and may even appear in typically developing infants and toddlers, in individuals with ASD RRBs tend to be pervasive, occur in younger children, cause distress, and/or last for significant portions of the day (APA, 2013; Evans, Uljarevic, Lusk, Loth, & Frazier, 2017; Leekam, Pryor, & Uljarevic, 2011; Uljarevic et al., 2017a). Also specific to ASD is the tendency for RRBs to change from more physical in nature to more interest-based as a child ages (Leekam et al., 2011; Uljarevic et al., 2017a). Children with the most severe forms of ASD and those with motor delays tend to have more physical and sensory behaviors, whereas children with milder forms tend to have more interest and routine-based RRBs (Leekam et al., 2011; Uljarevic et al., 2017a; Uljarevic, Heldey, Alvares, Varcin, & Whitehouse, 2017). Physical and sensory RRBs are linked to a child's emotional state and increase if a child is anxious, upset, frustrated, happy, or bored whereas interest and routine-based RRBs tend to be more pervasive (Cashin & Yorke, 2018; Leekam et al., 2011; Uljarevic et al., 2017a). Though the function of RRBs is unknown, hypotheses include escape from frustrating or uninteresting demands, access to pleasure, self-stimulation when bored, calming, and blocking out stimuli that is bothersome (Cashin & Yorke, 2018; Leekam et al., 2011; Uljarevic et al., 2017a). The four types of RRBs are summarized in Table 3 below.

*Associated symptomology.* Though not required for an ASD diagnosis, the *DSM-V* and other research list a variety of cognitive, academic, emotional, behavioral, and motor features that further support a diagnosis of ASD. Each of these areas of associated symptomology is summarized in Table 4.

*Educational definition and terminology.* ASD is a relatively new inclusion in educational disability identification. Prior to 1990, children with ASD were provided special education services under categories such as ID, ED, or SLD (McFarlane & Kanaya, 2009). Autism was first introduced as its own disability category in 1990; and in 2004 a definition of autism was included in IDEA (2004).

To qualify under the educational category of ASD under IDEA (2004), a child must (a) demonstrate significant difficulties with verbal and nonverbal communication and social interaction, (b) manifest interference with educational performance, and (c) evidence the disability before the age of three (unless all other conditions are met). Related characteristics under IDEA may include repetitive and stereotyped behaviors, difficulty handling change in routine, and/or unusual sensory responses. Also, the child's lack of progress must not be better explained by other factors such as cultural, linguistic, or environmental barriers, limited access to education, or any of the 12 other disability categories. The preceding definition is where federal guidance on autism eligibility ends and states begin developing autonomous eligibility guidelines and assessment practices, which has resulted in widely variable criteria from state to state, and even within states themselves (see Table 5). This variability in state criteria is potentially linked to widely

Table 2  
*Social-Communicative Characteristics of ASD*

	Reciprocity	
Eye Contact	Difficulties initiating and maintaining eye contact occur as early as 2 months and are the most commonly reported symptoms. Intense or too frequent eye contact can also occur, and subtle changes in gaze that match the emotions of the interaction may be difficult.	Chang, 2010; Hyman & Levy, 2013; Lord et al., 2012; Ornstein Davis & Carter, 2014; Saulnier, 2016;
Joint Attention	Challenges may be linked to poor understanding which situational aspects are most salient. Difficulties following the eye gaze or point of someone else, initiating or responding to showing, sharing, or telling. Ineffective requesting, independent retrieval of items, using others' hands as a tool. Low preference for social stimuli.	Chawarska, Macari, & Shic, 2012; Hyman & Levy, 2013; Lord et al., 2012; Ornstein Davis & Carter, 2014; Vivanti, Fanning, Hocking, Sievers & Dissanayake, 2017;
Imitation	70% of children with ASD have poor imitative skills, both when directed and naturally. Poor <i>quality</i> of imitation including imitating the object rather than the person, ignoring the subtleties, and using prediction to complete a partially imitated task. Stronger goal-oriented than social imitation. Imitative difficulties may also be linked to poor motor execution and self-body awareness.	Chetcuti, Hudry, Grant, & Vivanti, 2019; Okamoto et al, 2018; Vivanti & Hamilton, 2014; Vivanti, Trembath, & Dissanayake, 2014;
Paraverbal Communication	Difficulties using tone to convey meaning emerge in infancy. Older verbal children and adults with ASD tend to speak in either a monotonous, formal, pedantic, or 'sing-songy' voice, use little or exaggerated affect, and emphasize the wrong words. Other common vocal differences include nasality, hoarseness, high or low pitch, and difficulties modulating volume. Poor decoding of the paralinguistics of others.	Hyman & Levy, 2013; Lord et al., 2012; Klin, Jones, Schultz, & Volkmar, 2003; Martzoukou, Papadopoulou & Kosmidis, 2017
Echolalia	Children with ASD may echo others immediately or after some time. Echolalia can serve such functions as expressing emotions, making assertions, affirmative responses, requests, or self-regulation.	Kim, Paul, Tager-Flusberg, & Lord, 2014; Steigler, 2015;
Conversational Skills	Odd or unusual conversational mannerisms may include odd or stereotyped use of words and phrases and pronoun confusion. Tendency to demonstrate more language when discussing something of interest or when specifically prompted during a structured situation and less language during play or unstructured time. Difficulty generating topics for, initiating, maintaining, and terminating conversations. are interpreting the intent of the other person, explaining, describing and clarifying, asking questions about the other person's experiences, allowing the other person to	Hyman & Levy, 2013; Kim et al., 2014



lead, sharing interest in a topic, using appropriate personal space, or incorporating new information into the current conversation. Difficulty using words that represent cognitive states such as “think”, “pretend”, or “know”.

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#### Nonverbal Communication

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Gesture Use	As early as 1 year of age, children with ASD are observed to use fewer instances of pointing than typically developing peers. Older children demonstrate limited use of descriptive (e.g. holding the thumb and forefinger close to indicate “small”), conventional (e.g. shrugging to indicate “I don’t know”), or emphatic (e.g. slumping shoulders down when discussing feeling sad) gestures. More mental effort is required to decode the gestures used by others.	Aldaqr, Schuwerk, Daum, Sodian, & Paulus, 2016; APA, 2013; Hyman & Levy, 2013; Lord et al., 2012; Kim et al., 2014;
Facial Expression	Individuals with ASD may show little change in facial expression and difficulty expressing subtle emotional states such as confusion or boredom. Poor understanding and recognition of emotions expressed by others.	Hyman & Levy, 2013; Lord et al., 2012; Loth et al., 2018
Nonverbal Integration	Difficulty integrating gestures with eye contact, language, and facial expression. Difficulty integrating the nonverbal and verbal communication of others. In part, this could be attributed to failing to activate areas of the brain designed for interpreting other people and instead use areas designed for understanding objects .	Hyman & Levy, 2013; Kim et al., 2014

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#### Developing, Maintaining, and Understanding Relationships

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Social Withdrawal and Avoidance	In the most severe cases, individuals with ASD may fail to look at or attend to others, avoid social contact, or even act with aggression when approached. In more mild instances, individuals may have difficulty approaching others, avoid unstructured social situations such as recess or parties, or have difficulty working with others.	APA, 2013; Hyman & Levy, 2013
Friendships	Understanding the nature of friendships and relationships can be difficult for individuals with ASD, who may have a hard time describing the qualities that differentiate a friend and a classmate or coworker, engaging in reciprocal friendships, and sharing affective states with others.	APA, 2013; Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011; Lord et al., 2012; Mendelson, Gates & Lerner, 2016;
Social Rigidity	May demonstrate rigidity with others and become upset if interactions do not progress exactly as planned, or the same way they did previously. Much of this rigidity stems from a general difficulty in predicting as well as adjusting and monitoring behavior according to situational changes. May manifest in preferences for adult interaction or solitary play.	Hyman & Levy, 2013; Klin et al., 2003

Table 3

*Restricted and Repetitive Behaviors of ASD*

<u>Domain</u>	<u>Behaviors</u>	
Stereotyped Behaviors	Repetitive movements may occur with or without objects and include behaviors such as hand flapping, rocking, pacing, opening and closing doors, flicking or flapping objects, or self-injurious behaviors. Unusual posturing and hand movements include holding the fingers stiffly in different positions, hand wringing, or finger flicking. Non-communicative echolalia may be in the form of “scripting” (repeating movie or cartoon lines), making repetitive noises, or repeating the same word over and over. Finally, stereotyped behaviors may include repetitive play such as pushing the buttons of a cause and effect toy in the same order repeatedly.	APA, 2013; Hyman & Levy, 2013; Leekam et al., 2011; Uljarevic et al., 2017a, Uljarevic et al., 2017b
Insistence on Sameness	Stems from difficulty predicting and may present itself in response to smaller (e.g. eating out of a different bowl) or larger (changing classrooms) changes. May include strict adherence to rules, finding comfort in following a daily schedule, poor ability to make choice, or engaging in ritualistic behavior such as needing to count to 100 before leaving the house. Changes in routine or disruption of ritualistic behavior may result in marked distress that may lead to tantrums or negative behavior.	APA, 2013; Hyman & Levy, 2013; Leekam et al., 2011; Poljac, Hoofs, Princen, & Poljac, 2017; Uljarevic et al., 2017a
All-Consuming Interests	Interests tend to be more intense and all-consuming than their peers’ and may later lead to obsessions or distress. Circumscribed interests can range from simple fascination with certain objects such as hand dryers or mail, to repetitive questioning about certain topics, to an intense focus and fixation on complex topics such as the civil war or religion. May be a strength if incorporated into work or schooling. Can lead to difficulties with social relationships.	APA, 2013; Hyman & Levy, 2013
Sensory Differences	Visual differences may manifest in an individual’s tendency to closely examine lights, patterns, or details of toys, stare out of the corner of one’s eye, or be highly sensitive to fluorescent lights or movement around the room. Auditory hypo-reactivity is more common in younger children and may include seeking out or producing certain sounds and failing to respond to auditory input. Hyper-reactive individuals may cover their ears frequently or become upset if the room is noisy. Decreased sensitivity to pain and seeking out tactile input such as mouthing, chewing, or rubbing textures is common in individuals who are hypo-responsive to touch, whereas individuals who are hyper-responsive may resist certain types of clothing, avoid touch, or become upset if their clothes become wet or hands get dirty. Hyper-reactivity to tastes and smells may manifest in avoiding certain foods or gagging over strong smells. Hypo-reactive individuals may seek out sour or spicy foods or strong smells.	APA, 2013; Baranek, Little, Parham, Ausderau, & Sabatos-DeVito, 2014; Hyman & Levy, 2013; Tsatsanis & Powell, 2014

Table 4

*Associated Symptomology of ASD*

## Cognitive and Adaptive

General Cognition	Can span from profoundly impaired to highly gifted. Uneven cognitive profiles are common. Verbal abilities tend to be much lower than nonverbal and spatial abilities in younger and more severely impacted children. Older or higher functioning individuals tend to perform very well on tasks that do not require abstraction compared to performance on abstract tasks.	APA, 2013; Tsatsanis & Powell, 2014
Adaptive Abilities	Adaptive abilities tend to be more impaired than cognitive abilities, particularly when affected by comorbidities, and this gap may widen with age. Typically there are personal adaptive strengths in daily living skills and weaknesses in socialization.	APA, 2013; Chatham et al., 2018; Krapar, Kenworthy, Popal, Martin, & Wallace, 2017; Yang, Paytner, & Gilmore, 2016
Long-Term Memory	Average encoding, weakness in recall without cues and thematic organization. Strength in semantic memory and weakness in memory for personal experiences.	Bhat, Galloway, & Landa, 2010; Williams, Minshew, Goldstein, & Mazefsky, 2017;
24 Working Memory	Strength in rote repetition and weakness in mental manipulation, phonological working memory, and categorization	Bhat et al., 2010; Macizo, Soriano, & Paredes, 2016
Attention	Strengths in attention for preferred topics, visual details, simple repetitive tasks. Weaknesses in social attention, complex tasks, and shifting attention from preferred to non-preferred, salient to non-salient.	Sasson, Elison, Turner-Brown, Dichter, & Bodfish, 2011; Tsatsanis & Powell, 2014
Executive Functioning (EF)	Global EF delays with strengths noted during computer tasks and when social and cognitive demands are reduced. Weaknesses in flexibility, generalization, task initiation, planning, metacognition, self-monitoring are reported in some studies.	Bhat et al., 2010; Lai, Lombardo, & Baron-Cohen, 2014
Theory of Mind (TOM)	Impaired ability to understand another's mental state including thoughts, perceptions, feelings, beliefs, and desires. TOM weaknesses are thought to arise from early social deficits that keep an infant from cueing in to key social experiences and later develop into weaknesses with shared attention and empathy.	Baron-Cohen, 2005; Bauminger-Zviley, 2014; Gaigg, 2012; Gallese, Gernsbacher, Heyes, Hickok, & Iacoboni, 2011

Central Coherence	Difficulty incorporating multiple sources of information to construct a meaningful whole and is thought to be linked to insistence on sameness and routine, heightened attention to detail, and difficulties understanding figurative language. Weak central coherence is thought to be associated with many non-diagnostic features of ASD.	Booth & Happé, 2010; Gallese et al., 2011; Skorich et al., 2016
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Academic

General	The overall academic level of students with ASD is on par with intellectual and adaptive functioning until the age of 8, when higher level thinking, abstraction, and comprehension become necessary skills. Strengths in academic areas that require rote memorization of facts, and weaknesses on tasks involving comprehension, generation of ideas, and planning is linked to poor EF, theory of mind, and central coherence. However, wide variation in individuals is noted.	Keen, Webster & Ridley, 2016; Klin et al., 2003; Schaefer Whitby & Richmond, 2009
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Literacy	Spelling, vocabulary, letter recognition, and word reading are generally stronger subjects for children with ASD than narrative writing and reading comprehension. Hyperlexia may occur in 5-10% of children with ASD.	APA, 2013; Keen, Webster & Ridley, 2016; Klin et al., 2003
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25 Math	Math computation is generally strong, while word problems and complex multi-step problem solving may be more difficult. Young children may readily memorize numbers, but have difficulty matching visual symbol to quantity	Keen, Webster & Ridley, 2016; Schaefer Whitby & Richmond, 2009
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Language

General	Delays are common in children with moderate and lower functioning forms of ASD. First words amongst children with ASD tend to emerge around 38 months, as opposed to 12 months for typically developing peers. Twenty percent of children with ASD will never use verbal language.	Kim et al., 2014
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Regression	May be observed in up to 20-25% of young children with ASD, whose parents may report a loss of previously acquired words around 2 years of age.	Kim et al., 2014
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Receptive, Expressive	Receptive language delays are also common; may be more pronounced than expressive delays	Kim et al., 2014
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Emotions, Mood, and Behavior

Emotions	Difficulty with both expression, recognition of, and response to emotions. Jealousy is intact, but expression of subtler emotional states that are other-	Harms, Martin, & Wallace, 2010; Hobson,
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Empathy	oriented such as self-consciousness, pride, guilt, pity, and concern is more difficult. The processing of facial emotions by young children with ASD is a cognitively mediated process that tends to not develop with automaticity  Children with ASD can differentiate between self and other during empathy tasks but have distinct empathy profiles including difficulty perspective taking, but intact ability to report empathetic feelings when witnessing others experiencing a traumatic event	2014; Loth et al., 2018; Griffiths, Jarrold, Penton-Voak, Woods, Skinner, & Munafò, 2017 Hoffmann, Koehne, Steinbeis, Dziobek & Singer, 2016; Schwenck et al., 2012
Comorbid Mood and Emotional Disorders Behavior	Higher rates of anxiety and depression exist in ASD, but can be difficult to assess due to lack of ASD inclusion in standardization samples and limited emotional insight.  Challenging behaviors (CBs) that impede activities of daily living occur in up to 90% of children with ASD, with aggressive behaviors occurring in 25% of children with ASD. CBs are more common in children with ASD than in those with many other neurodevelopmental disorders including ID, and are associated with poor sleep, low IQ, and attention problems. The spectrum of CBs can range from mild work avoidance to severe aggression toward self and other and may include such behaviors as food refusal, tantrums, elopement, disruptive noises, climbing and jumping from furniture, or inappropriate sexual behavior.	Kroncke et al., 2016; Strang et al., 2012  APA, 2013; Beighley et al., 2013; Hill et al., 2014; Kaartinen et al., 2012; Robb, 2010
<hr/> <b>Motor</b>		
General	Motor difficulties in ASD seem to occur at similar rates as other neurodevelopmental disorders. Motor difficulties in the ASD population may be linked to overreliance on proprioceptive input and under-reliance on visual input. Fine motor, gross motor, motor planning, motor learning, and postural stability may all be affected.	Bodison & Motofsky, 2014; Hyman & Levy, 2013; Provost, Lopez, & Heimerl, 2007.

variable rates of ASD identification, ranging from 1.1% of all special education identifications for children ages 6-21 in Iowa, to 17.9% in California (Barton et al., 2016).

Overall, the unique terminology, assessment practices, and eligibility requirements of educational settings potentially add another layer of diagnostic confusion to ASD.

Table 5  
*State Criteria for Educational Identification of ASD*

Criteria	States
IDEA (2004) definition only	AZ, AR, CT, DC, HI, KS, KY, LA, MD, NE, NH, NM, NY, OH, PK, PA, VA, WA
IDEA (2004) definition plus other criteria	AL, AK, CA, CO, DE, FL, GA, ID, IL, IN, IA, ME, MA, MI, MN, MS, MO, MT, NV, NJ, NC, ND, OR, RI, SC, SD, TN, TX, UT, VT, WV, WI, WY
IDEA (2004) definition plus DSM criteria	CA, DE, GA, IL, IN, ME, MA, MI, MN, MO, MT, ND, SD, TX, UT, WV, WY
Clinical diagnosis or clinical diagnostician required	AL, AK, ID, ME, MI, NJ, OR, TN, VT, WV, WY
Specific observation requirements	AL, AR, CO, DC, DE, FL, IN, KS, LA, ME, MN, MO, NC, NY, OK, OR, RI, SC, TN, VA
School psychologist required to be part of the assessment team	NY, PA, SC, WV
Specific norm-referenced ASD-specific assessment tools required	ID, MA, NJ, UT, VT
Family Input Required	AL, AK, CO, CT, DC, DE, FL, GE, IN, IA, KS, LA, MD, MA, MN, MS, NV, NJ, NM, NC, ND, SC, SD, TN

*Barton et al., 2016; MacFarlane & Kanaya, 2009.*

**Etiology.** Though there seem to be as many hypothesized causes of autism as there are ASD researchers, most agree that a complicated interplay between biology and environment is at the root of this condition. Some emerging theories posit that a cumulative effect of toxins may switch on certain genes that alter neurological development in early infancy, or even through epigenetic changes in the mother's or father's DNA prior to conception (Amaral, 2017; Kim & Leventhal, 2015; Lyall,

Schmidt, & Hertz-Picciotto, 2012; Sandin, Klevzon, Levine, Hulman, & Reichenberg, 2012). Twin and sibling studies reveal that there is a 71% likelihood that identical twins will both have ASD and having a sibling with ASD is the biggest risk factor for developing the condition (Bourgeron, 2016; Connolly & Hakonarson, 2014; Gaugler et al., 2014; Hyman & Levy, 2013). Conversely, there is also a 29% chance that one twin and a 72-98% chance that siblings will not develop ASD, suggesting that environment also plays a role (Gaugler et al., 2014; Hyman & Levy, 2013; Lai et al., 2014; Lyall, Schmidt, & Hertz-Picciotto, 2014). Different environmental risk factors (e.g., exposure to automobile pollutants or certain maternal medications, maternal obesity or age) may interact with different genetic mutations to create different forms of autism (Amaral, 2017; Kim & Leventhal, 2015; Lyall et al., 2012; Sandin et al., 2012). Some researchers refer to the gene-environment interplay as the “Triple hit theory” suggesting that ASD is the result of a genetic predisposition paired with an environmental stressor that occurs during a critical period of neurological development (Amaral, 2017; Cassanova, 2014, p. 521). Studies of the gene-environment interplay of other neurodevelopmental disorders indicate that there is a distinct possibility that more common genetic variations may predispose one to having a psychopathology in general, and combinations of rare genetic variations and environmental risk factors may specify a pathway toward a particular condition (Amaral, 2017; Constantino & Charman, 2016; Rutter & Thapar, 2014).

Research on the neurological presentation of ASD has been as confounding as genetic and environmental research, particularly due to findings that children with the same behavioral presentation may have completely different neurological makeup and

also that children with different diagnoses may have underlying neural similarities (Cassanova, 2014; Sivapalan & Aitchison, 2014). One recent theory is that there is a domino or cyclic effect, where certain genes activate faulty pruning and excitatory mechanisms, which leads to difficulty attending to key social experiences and hyperfocus on object-orientated experiences, which in turn leads to physical changes in key social structures due to lack of use, making it even more difficult to attend to social experiences in the future (McPartland, Tillman, Yang, Bernier, & Pelphrey, 2014; Uppal & Hof, 2012). Despite the gaps in current research pertaining to etiology, most experts in the field seem to agree that ASD is a neurological condition resulting from environmental and genetic factors that interact during critical periods of early brain development and that each combination of factors leads to a different pathway toward ASD.

***Prevalence.*** As evidenced by increasing public awareness, mainstream media coverage, research funding, and journal articles on the topic, the rising rate of ASD is alarming to the general public and clinicians alike. Those who believe there is no true increase claim that more inclusive diagnostic criteria, substitution of ASD diagnoses for previously identified ID or SLD, increased public knowledge, and/or inclusion of autism as a disability category in IDEA (2004) are the root of the increase (Matson & Kozlowski, 2011; Rosenberg, Daniels, Law, Law, & Kaufman, 2009). Others cite evidence that the gene-environment interplay and increased pollution are to blame for a true increase (Dawson, 2013; Nevison, 2014). Though the jury is still out on the origin of the rise in ASD diagnoses, there is consensus that gender and culture-linked prevalence variations exist.



*Gender differences.* ASD is currently diagnosed in approximately 1 out of 68 children in the United States, with boys being about four times more likely to be diagnosed than girls (Christensen et al., 2016). Girls who are diagnosed with ASD tend to have much more severe forms of the disorder, and amongst boys and girls with comorbid ID the rates of ASD diagnosis are fairly even, leading some to believe that girls with less severe forms of ASD remain undiagnosed (APA, 2013; Mandell et al., 2009).

*Cultural differences.* Research devoted to the study of racial and socioeconomic disparities in ASD identification has led to the conclusion that any differences in prevalence stem from diagnostic error, bias, and access to evaluations rather than within individual or culture variables (Magaña, Lopez, Aguinaga, & Morton, 2013). White children and children from more affluent families are much more likely to be diagnosed with ASD, receive their diagnoses earlier, and receive specialized services than Black and Hispanic/LatinX children and those from poorer households (Christensen et al., 2016; Durkin et al., 2010; Parikh et al., 2018; Sullivan, 2013; Thomas et al., 2012).

Public schools play a vital role in fair identification and service provision. Cultural and socioeconomic differences in prevalence are minimized when educational-based data are included (Christensen et al., 2016), indicating that schools may be the first place that families without access to specialized clinical care receive support when there are concerns about their child's development. Additionally, prevalence rates tend to increase in areas where school-based identifications are counted amongst the data (Christensen et al., 2016; Sullivan, 2013), suggesting that some children receive educational, but not clinical ASD identifications. For children from rural and low-income

communities, schools may be the only accessible place to receive ASD evaluations (Broder-Fingert, Shui, Pulcini, Kurowski, & Perrin, 2013). Though it is apparent that the role of public schools is vital in equitable access in the identification of ASD, it is also clear that there is a lack of clinical and school-based consistency in identification criteria.

Until more research, training, and guidelines in fair, non-biased, and comprehensive ASD identification amongst all parties are provided and identification criteria are more closely aligned, it is likely that true prevalence rates will remain unknown. In particular, support, research, and training in interpreting the complex and intertwined symptomology of ASD and associated conditions will be vital for increased accuracy in research and diagnosis. Following is a discussion of this complex symptomology of several conditions as they intertwine with those of ASD.

**Other health impairment.** The IDEA (2004) definition of OHI includes: a) limited strength, vitality, or alertness, including a heightened alertness to environmental stimuli that results in limited educational alertness; b) chronic or acute health problems (e.g., asthma, ADHD, diabetes, epilepsy, hemophilia, lead poisoning, leukemia, sickle cell anemia, Tourette syndrome); and c) adverse educational performance (IDEA, 34 C.F.R., Section 300.8 (c)(9)). As one might surmise from these guidelines, OHI is a fairly open-ended category that encompasses highly disparate conditions and leaves states and school districts ample freedom in defining the terms, “strength”, “vitality”, “alertness”, and “chronic or acute health problem” as well as which conditions fulfill those criteria. Furthermore, though some conditions such as sickle cell anemia require a medical diagnosis, others such as ADHD may be provided through school-based evaluations.

Approximately 13% of children receiving special education are eligible through the OHI category, and of OHI-qualifying conditions, ADHD is the most common (Children and Youth with Disabilities, 2016; Grice, 2002). Other conditions that may fall under the OHI category and that share symptomology with ASD include: Tourette syndrome, epilepsy, brain injury resulting from meningitis or encephalitis (M/E), fetal alcohol spectrum disorders (FASD), and optic nerve hypoplasia/septo-optic dysplasia (ONS/SOD). Because ADHD is the most commonly occurring OHI and the most common differential condition for ASD, it will be the focus of this section.

***Attention deficit-hyperactivity disorder.*** ADHD is a neurodevelopmental disorder that affects about 5% of children nation-wide (APA, 2013). The defining diagnostic indicators are multiple (at least 6 in each category) symptoms of inattention and/or hyperactivity that persist for at least 6 months, occur before 12 years of age, and reduce the quality of daily living (APA, 2013). *Inattention* can be summarized as failing to pay close enough attention to tasks of daily living in order to carry them out successfully, and *hyperactivity* refers to excessive verbal or motor activity that interferes with activities of daily living (APA, 2103). Related challenges may occur in the areas of executive functioning (EF), cognition, social emotional development, sensory regulation, communication, academics, and motor skills.

Up to 25% of children with ASD meet full diagnostic criteria for ADHD, while 65-85% of children with ADHD have elevated scores on social-communicative ASD screeners (Antshel, Zhang-James, & Farone, 2013; Cooper, Martin, Langley, Hamshire, & Thapar, 2014; Helland, Helland, & Heimann, 2014; Staikova, Gomes, Tartter,

McCabe, & Halperin, 2013). Even on the Autism Diagnostic Observation Schedule, 2<sup>nd</sup> Edition (ADOS-2) and Autism Diagnostic Interview – Revised (ADI-R), the gold standards for ASD diagnosis, 21-30% of children with ADHD meet the cut-off for ASD when the strictest criteria were used, and 67% met the cut off when more lenient cut off established by the Collaborative Programs for Excellence in Autism (CPEA) (Grzadzinski, Dick, Lord, & Bishop, 2016). Children with ADHD are also more likely to have elevated scores on measures of RRBs, the extent to which is correlated with levels of hyperactivity, inattention, and/or impulsivity (Cooper et al., 2014; Martin, Hamshere, O'Donovan, Rutter, & Thapar, 2014; Ronald, Larsson, Anckarsäter, & Lichtenstein, 2014). Overall, given the score elevation on several screeners and assessments, ADHD may be one of the most difficult conditions to differentiate from ASD.

Though multiple symptoms of ADHD may mimic those seen in ASD, a careful observer will notice subtle qualitative differences in presentation. Generally, social and communication problems in ADHD tend to stem from impulsivity, inattentiveness, and inappropriateness rather than aloofness or social disengagement (Kroncke et al., 2016). Children with ASD are more likely than their peers with ADHD to have unusual eye contact, fewer facial expressions directed to others, and less attempts at social communication (Grzadzinski et al, 2016). This difference in function leads to interactions with children with ADHD that while not always appropriate, tend to feel more natural, reciprocal, and less awkward or odd to others (NICE, 2011). Comparatively, children with ADHD usually understand the *whys* and the greater societal importance behind social rules and norms, even if unable to demonstrate them in the moment (NICE, 2011).

Reading and language comprehension may be compromised in ADHD, but rather than an inherent difficulty with central coherence, comprehension deficits can generally be tied to inattention and other EF challenges (Glanzman & Sell, 2013). Similarly, requesting, giving, showing, or sharing, and talking about one's own thoughts, memories or feelings are not inherent difficulties but secondary to attention and EF difficulties. And though the expression of eye contact, imitation, nonverbal communication, and imaginative play development may be hindered by inattention or impulsivity, they tend to be intact in children with ADHD (Antshel et al., 2013; Biscaldi et al., 2015). Finally, echolalia and unusual prosody are not observed in ADHD. Though these differences may be noticed by a trained observer, the ADI-R, which relies on parent report of early childhood indicators, is unable to reliably differentiate between the social-communicative challenges of ADHD and ASD (Grzadzinski et al., 2016).

There also exist several clinical diagnostic criteria for ADHD that may be confused for RRBs. *DSM-V* descriptions of ADHD include: easily distracted by external stimuli, fidgets with or taps hands, runs about or climbs, acts as if driven by a motor, talks excessively (APA, 2013). Though some of these behaviors may mimic the RRB seen in ASD, a diagnostician might note whether they are pervasive in nature and if they fulfill the same needs as they do in ASD. Another common behavior in ADHD that may be mistaken for a RRB is the tendency to tantrum or protest when presented with unexpected changes in routine (Blum et al., 2008). However, in children with ADHD, this is generally due to not wanting to leave an enjoyable activity but rather than an inability to process change or predict outcomes (Kroncke et al., 2016).

Finally, several key ASD behaviors are not typically observed in ADHD. Fascination with repetitive movements of objects and the tendency to focus on details of objects or toys is ASD specific and not observed in ADHD (Antshel et al., 2013). No evidence was found to support other RRBs such as repetitive vocalizations, complex hand mannerisms or posturing, or all-consuming interests outside of video or computer games in children with ADHD. Additionally, though they benefit from consistent structure, routine, and schedules, children with ADHD seem to prefer novelty over sameness and may have increased attention rather than anxiety when presented with something new (Antshel et al., 2013). Table 6 summarizes diagnostic criteria and associated symptom terminology of ADHD as they do and do not relate ASD.

In conclusion, children with ADHD share a wide range of symptoms with ASD as well as demonstrate symptoms that can at first glance be mistaken for those of ASD. Overall, it is fair to say that differentiating ASD from ADHD can be a daunting task that requires careful observation and elicitation of qualitative differences.

***Additional OHI considerations.*** Several conditions that could qualify under the OHI category and that also share ASD symptomology include Epilepsy, TS, FASD, M/E, and ONH/SOD.

Epilepsy is a seizure disorder that is diagnosed by a medical professional after two or more seizures occur 24 hours or more apart (Zelleke, Depositatio-Cabacar, & Galliard, 2014). Up to 27% of children with ASD may develop epilepsy (Jeste & Tuchman, 2015). Comorbid ID is the biggest risk factor for developing epilepsy; children

Table 6

*ASD-Like Characteristics of ADHD*

Social Communication	Difficulties sustaining attention during play and conversation, difficulties with communicative turn-taking, interrupting or intruding upon others, difficulty interpreting vocal prosody and social nuances of others, poor social judgment, less motivated by social reinforcement, difficulty sustaining reciprocal play and interaction, engage in more independent functional or sensorimotor play and less imaginative play, demonstrate less competency, cooperation, and flexibility with others, difficulty maintaining friendships and tend to be rejected by their peers	Alessandri, 1992; Antshel et al., 2013; APA, 2013; Glanzman & Sell, 2013; Grzadzinski et al., 2016; Nomand et al., 2011
RRBs	Repetitive movements such as pacing or rocking, excessive talk about one's own interests, difficulty handling changes in routine, propensity to act inappropriately in unfamiliar situations or settings, perseveration and hyperfocus on computer and video games, sensitivity to sensory input	Blum et al., 2008; Grzadzinski et al., 2016; Helland et al., 2014; Mazurek & Engelhardt, 2013; NICE, 2011; Rommelse, Geurts, Franke, Buitelaar, & Hartman, 2011;
Associated Symptoms	Strengths in Simultaneous and Successive processing and weaknesses in planning, attention, and processing speed; EF deficits; challenges with cognitive flexibility; poor theory of mind, emotional processing, and recognition of facial expressions stemming from early difficulties attending to key social experiences; reading and language comprehension difficulties; motor and language delays; behavioral challenges	Bauminger-Zviely, 2014; Blum et al., 2008; Bühler, Bachmann, Goyert, Heinzl-Gutenbrunner, & Kamp-Becker, 2011; Canivez & Gaboury, 2016; Dyck & Piek, 2014; Glanzman & Sell, 2013; Grzadzinski et al., 2016; Pennington, 2008; Taddei & Contena, 2013; Taddei, Contena, Caria, Benturini, & Venditti, 2011;

with ASD, ID, and epilepsy tend to have more severe behavioral symptoms than children with any condition alone (Jeste & Tuchman, 2015; Viscidi et al., 2014).

Tourette syndrome is characterized by the presence of multiple motor and at least one verbal tic that have initial onset prior to age 18 and persist for at least 1 year (APA, 2013). Due to symptoms that mimic those seen in ASD it is not uncommon for individuals with TS to be misdiagnosed with ASD (Freeman, Hart, & Hunt, 2015).

FASDs are a group of disorders characterized by prenatal exposure to alcohol and resulting behavioral, neurocognitive, and physical effects (Fetal Alcohol Spectrum Disorders, 2016). These disorders are likely under-diagnosed due to professional reluctance to ask about prenatal alcohol exposure (Peadon & Elliott, 2010). FASDs share social communicative, RRB, and associated symptoms with ASD, and knowledge of these symptoms is crucial for the purposes of differentiation.

M/E are serious infections that can lead to neurological damage in young children and are considered risk factors for developing ASD and other developmental delays (Hyman & Levy, 2013; Marques, Brito, Conde, Pinto, & Moreira, 2014).

ONH and SOD are congenital neurological abnormalities that affect the optic nerves and lead to a complete or partial absence of the corpus callosum (Fink & Borchert, 2011). ONH and SOD may result in mild to profound vision impairment or blindness and may affect one or both eyes (Fink & Borchert, 2011). If either of these conditions resulted in significant visual impairment, the IDEA (2004) category Blindness would likely be used. However, if vision is relatively intact, OHI may be considered as an



Table 7

*Shared and Distinguishing Characteristics of OHIs and ASD*

<u>OHI</u>	<u>Characteristics Shared with ASD</u>	<u>Differentiating Characteristics</u>	
Epilepsy	Poor social communication and pragmatics; social isolation and peer rejection; absence seizures may be mistaken for a lack of interest in one's surroundings; language regression; problem behaviors; anxiety; inattention; EF and memory challenges; and motor delays. Finally, if localized seizures occur in the temporal lobe, children with epilepsy may have difficulty with emotional recognition	No evidence of restricted and repetitive behaviors; intact social interest and play relative to developmental levels. Determine if social and communicative impairments are above and beyond any global delays and if ASD symptomology existed prior to seizure onset. Certain anticonvulsant medication can lead to cognitive and behavior challenges and even psychosis, which should also be differentiated from ASD symptomology.	Berg, Loddenkemper, & Baca, 2014; Drewel & Caplan, 2007; Jeste & Tuchman, 2015; Kanner, 2011; Lew et al., 2015; NICE, 2011; Zelleke et al., 2014
Tourette Syndrome	Difficulties with recognizing and interpreting social cues, social reciprocity, social motivation, generating and implementing solutions to social problems; lack of inhibition in social relationships; stigmatization may lead to difficulties maintaining peer relationships; vocal tics may present with unusual prosody, snorting, yelling, prosodic changes, or echolalia; tics are highly repetitive and may include making animal sounds, repeating phrases, speaking as if different characters, eye blinking, flapping arms or hands, grimacing, fiddling with clothes or objects, or flexing fingers; sensory modulation difficulties are common; general behavior challenges, learning disabilities, and emotional lability.	Intact abilities in identifying feelings in others, theory of mind, empathy, and pragmatics; no evidence of unusual eye contact or difficulties in play, joint attention, self-reflection, or the use of gestures (though any of these abilities could be masked by competing tics); tics associated with TS tend to be involuntary; both TS tics and ASD stereotypies tend to increase during emotionally charged situations, but in only in ASD do they also increase during periods of down time; children with TS do not demonstrate insistence on sameness and routine, adherence to rules and schedules, resistance to change, EF deficits, or a distinct neuropsychological profile.	APA, 2013; Burd, Christensen, & Kerbeshian, 2008; Channon, Sinclair, Waller, Healey, & Robertson, 2004; Eapen, Cavanna, & Robertson, 2016; Leekam et al., 2011; Lavoie, Thibault, Stip, & O'Connor, 2007; McGuire, Hanks, Lewin, Storch, & Murphy, 2013; Saulnier & Ventola, 2012; Weisman, Apter, Steinberg, & Parush, 2013; Vert, Geurts, Roeyers, Oosterlaan, & Sergeant, 2005;

Fetal Alcohol Spectrum Disorder	Similar scores on ASD rating tools; difficulties with recognizing and interpreting social cues, social reciprocity, social motivation, social communication, and solving social conflicts; less socially engaged than their peers; behaviors that may be confused with RRBs include difficulty transitioning between activities, distress at changes in routine, and repeating what they have said several times; sensory processing deficits; EF and theory of mind deficits, difficulty with self-reflection and self-monitoring, inattention and hyperactivity, general behavioral challenges and tantrums, difficulty with abstract and deductive reasoning, concept formation, cognitive flexibility, working memory, verbal memory, cognitive fluency, adaptive impairments, and language and motor delays.	No difference compared to neurotypical individuals in eye contact, initiating social interaction, sharing affect with others, or using nonverbal communication; No evidence of echolalia or differences in prosody, play development, or imitation, stereotyped behaviors, perseverative interests, or unusual focus on detail; weaknesses in visual-spatial and math compared to reading and writing abilities; tend to have substantial fluctuation in social and behavioral performance and are often described as being unpredictable. There is no characteristic physical phenotype in ASD as there can be in FASD.	Abele-Webster, Magill-Evans, & Pei, 2012; Bishop, Gahagan, & Lord, 2007; Kjellmer & Olswang, 2013; Peadon & Elliott, 2010; Stevens, Nash, Koren, & Rovet, 2013;
Meningitis and Encephalitis	Learning disability, behavioral challenges, tantrums, language impairments, language, behavioral, and cognitive regression, inattention and hyperactivity, poor imitation, poor eye contact, preference for solitary play, repetitive behaviors, sensory impairments, and abnormal behaviors	Skill regression that occurs in conjunction with an infection, particularly after the age of 3, may indicate that ASD is not the true cause of symptomology.	Bedford et al., 2001; DeLong, Bean, & Brown, 1981; M. Ghaziuddin, Al-Khouri, & N. Ghaziuddin, 2002; Hargrave & Webb, 1998; Marques et al., 2014; Fink & Borchert, 2011; Parr, Dale, Shaffer, & Salt, 2010
Optic nerve hypoplasia/ Sept-Optic dysplasia	Social communication and interaction deficits similar to ASD as well as vocal abnormalities including unusual prosody, echolalia, and pronoun reversal; restricted and repetitive interests and behaviors, obsessions, self-stimulatory behaviors, and sensory sensitivities.	Limited to no research found in this area.	

eligibility category. Table 7 summarizes the symptomology that intersects with that of ASD as well as differentiating features of each of the disorders discussed above.

**Speech and language impairment.** Approximately 21% of students who receive special education services do so for SLI, making it the second most common disability category (Children and Youth with Disabilities, 2016). According to IDEA (2004), a “speech or language impairment means a communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment that adversely affects a child’s educational performance” (IDEA, 34 CFR, Section 300.8(c)(11)). Speech and language challenges are observed in both the direct ASD diagnostic criteria and diagnostic specifiers in the DSM-V; thus, careful differentiation of SLI from ASD is an important part of a school-based team’s decision-making process.

Children with SLI can present with symptomology ranging from minor articulation or fluency problems to pragmatic difficulties to severe apraxia (APA, 2013). This heterogeneity, along with the possible influence of common comorbidities such as ADHD, SLD, and anxiety, can further complicate diagnostic clarity (Botting, Toseeb, Pickles, Durkin, & Conti-Ramsden, 2016; Dyck & Piek, 2014; Haebig, Kaushanskaya, & Weismer, 2015; Maggio et al., 2014). Articulation difficulties and stuttering are relatively easy to diagnose and barring any comorbidities should be easy to differentiate from ASD, so they will not be addressed in this section. This section will focus on shared and differential characteristics of general language disorder and social pragmatic communication disorder. Table 8 summarizes those shared characteristics of language

disorder as they pertain to social-communicative functioning, RRBs, and related symptomology of ASD.

***Language disorder.*** Language disorder is a developmental condition characterized by a persistent difficulty using language across multiple modalities that leads to impairment in academic functioning, social relationships, and/or adaptive capabilities (APA, 2013). Several primary and associated characteristics of language disorder are similar to those seen in ASD. However, an expert evaluator may notice differences in the presentation of those characteristics. One major difference is that in SLI, social challenges develop secondary to language challenges (Farrant et al., 2011; Pennington, 2012). For instance, children with language disorder may experience difficulties communicating with others, which may lead to withdrawal and avoidance due to anxiety and frustration around social interactions. In turn, this leads to fewer social experiences and underdevelopment of social skills.

Though there are many social and communicative challenges observed in children with language disorder that mimic those seen in ASD, several key features differentiate the two conditions. Compared to those with language disorder, children with ASD have a significantly harder time understanding social or emotional content compared to their ability to understand other types of information (Loucas et al., 2008). During conversation, children with ASD alone make fewer grammatical errors and more pragmatic and social errors than children with language disorder (Haebig et al., 2015; Mawhood, Howlin, & Rutter 2000). Even though they may develop poor social skills, given appropriate language supports, children with language disorder demonstrate

Table 8

*ASD-Like Characteristics of Language Disorder*

Social Communication	General social difficulties; quiet and reluctant to speak, withdrawn and socially isolated, and have difficulty making and maintaining friendships; difficulties with initiating and responding to social interaction, solving social conflicts; may make speaking errors that seem odd or unusual or fail to respond appropriately to other's attempts at communication; may be less preferred by their peers, engage in solitary play more than their peers, and seem disengaged in the classroom; very young infants and toddlers may demonstrate limited eye contact and joint attention.	Brumbach & Goffman, 2014; Farrant, Mayberry, & Fletcher, 2011; Liiva & Cleave, 2005; Marton, Abramoff, & Rosenzweig, 2005; Maggio et al., 2014; McCabe, 2005; Pennington, 2012; Rescoria & Goossens, 1992; Stanton-Chapman, Justice, Skibbe, & Grant, 2007; Wray, Norbury, & Alcock, 2016
RRB	Children with language disorder, given their poor understanding of verbal explanations, may over-rely on routines and thus develop some rigidity and distress when routines are disrupted.	Pennington, 2012
42 Associated Symptomology	Split between verbal and nonverbal cognitive abilities; difficulty interpreting complex language and expressing their thinking and may appear to have deficits in complex or abstract tasks; difficulties with sustained visual attention, planning, inhibition, goal maintenance, and internal verbal mediation; working memory difficulties are common and tend to be most pronounced on verbal tasks; poor emotional regulation; common externalizing and internalizing behavioral and emotional challenges; poor integration of the visual and auditory emotional expression of others; difficulty visually differentiating between subtle emotional states; may demonstrate aggression, low frustration tolerance, rule breaking, anxiety, and depression; increased fine and gross motor delays and poor motor control.	Adi-Japha, Strulovich-Schwartz, & Julius, 2012; Hus et al., 2013; Brumbach & Goffman, 2012; Botting et al., 2016; Brisco & Rankin, 2009; De Fosse et al., 2004; Finneran, Francis, & Leonard, 2009; Ford & Milosky, 2003; Lukács et al., 2016; Maggio et al., 2014; Pennington, 2012; Spackman, Fujiki, & Brinton, 2006; Taylor, Maybery, Grayndler, & Whitehouse, 2015; Taylor, Mayberry, & Whitehouse, 2012; van Daal, Verhoeven, & van Balkom, 2009; Williams, Botting, Boucher, & Cooper, 2008;

adequate understanding of the social world (Saulnier & Ventola, 2012). Though some children with language disorder will have difficulty with the use of gesture and facial expression, many will overcompensate for language difficulties with these forms of communication (Saulnier & Ventola, 2012). Finally, there is no evidence that children with language disorder alone demonstrate pronoun reversals, jargon, stereotyped language, formality, or echolalia (Kroncke et al., 2016; Williams et al., 2008).

Though there seem to be many clear differentiating characteristics between the social and communicative functioning of children with ASD and those with language disorder, evaluation teams should be cautious as many of these differentiating characteristics are qualitative in nature and not easily captured by formal language testing (Loucas et al., 2008). Examination of RRBs and associated symptomology is vital in accurate identification. Children with language disorder, given their poor understanding of verbal explanations, may over-rely on routines and thus develop some rigidity and distress when routines are disrupted (Pennington, 2012). This distinguishes them from children with ASD, who tend to be rigid due to inability to make predictions. Additionally, early swallowing difficulties may be mistaken for sensory defensiveness and food aversion, but this tends to resolve later in childhood (Pennington, 2012). Overall, there is very little additional evidence that children with language disorder demonstrate RRBs or sensory impairments. However, one should be cautious of comorbid conditions that do demonstrate RRBs, as the presence of language disorder and one of these conditions may be more likely to be mistaken for ASD.

Several additional factors work to differentiate the associated features of ASD and language disorder. Though early language delay is common in both language disorder and ASD, compared to those with ASD, children with language disorder tend to have higher receptive than expressive language, whereas in ASD it is more common to have the reverse profile (Loucas et al., 2008; Williams et al., 2008). Children with language disorder do not tend to have the strengths in rote vocabulary, grammar, and word decoding observed in their counterparts with ASD (Haebig et al., 2015; Williams et al., 2008). Finally, children with language disorder have stable language abilities, unlike children with ASD who have inconsistent language abilities dependent on the environment and social demands (Kroncke et al., 2016). In examining nonverbal abilities, children with language disorder commonly demonstrate weaknesses in spatial processing compared to overall nonverbal abilities; a profile that is not common in ASD alone (Taylor, Maybery, Grayndler, & Whitehouse, 2014). Though there is not a disorder-specific deficit in abstract thinking and theory of mind, limited expressive and receptive language may interfere with tasks that measure these constructs. Inattention in the classroom may be observed, but this is likely due to difficulties following along with verbal content, rather than the inward focus commonly seen in ASD and one may observe improvement during visual demonstrations (Pennington, 2012). Also, working memory difficulties are common in children with language disorder and tend to be most pronounced on verbal tasks (Brisco & Rankin, 2009; van Daal, Verhoeven, & van Balkom, 2009). Finally, challenging behaviors plus language impairment may lead to diagnostic confusion with ASD, but qualitative differences in the function of these

behaviors may help to differentiate (Maggio et al., 2014). Most notably, children with language disorder may demonstrate challenging behaviors after failed communication attempts or within language-heavy environments (Stanton-Chapman et al., 2007; Adijapha, Strulovich-Schwartz, & Julius, 2012; Hus et al., 2013; Brumbach & Goffman, 2012).

***Social pragmatic communication disorder.*** Social Pragmatic Communication Disorder (SCPD) is a new *DSM-V* diagnosis and was designed to describe children with the social communicative difficulties seen in ASD but no evidence of current or past restricted and repetitive behaviors or interests or strong adherence to routines or rituals. Because this is a relatively new diagnosis, there is limited to no information about whether children with SCPD share any of the associated cognitive, emotional behavioral, or motor characteristics with ASD. Though seemingly effortless to differentiate between ASD and SPCD by examining the presence or absence of RRBs, as of yet there is no guidance about how to proceed if a child demonstrates mild RRBs that may also be seen in typically developing peers such as one strong interest, mild rigidity, or a sensory sensitivity (Brukner-Wertman, Laor, & Golan, 2016). Furthermore, evaluation teams should be cautious when there is evidence of comorbid conditions that do demonstrate RRBs such as ADHD or anxiety disorders.

**Specific learning disability.** Approximately 35% of students who receive special education services qualify under the SLD category, which is the most common disability category under IDEA (2004) (Children and youth with disabilities, 2016). The educational definition of SLD includes: a) a disorder in 1 or more of the basic



psychological processes involved in understanding or in using language, spoken or written; b) a disorder that manifests itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations; and c) a disorder that includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia (IDEA, 34 C.F.R., Section 300.8(c)(30)). Though SLD affects a student's academic progress, many associated symptoms may resemble characteristics of ASD. One SLD in particular, NVLD, shares many behavioral characteristics with ASD and will be explored in depth.

One important key difference between the social difficulties seen in SLD and ASD is that in ASD they seem to be inherent to the disorder, whereas in SLD they seem to stem from learning and EF challenges. Social difficulties that arise from learning disability may manifest in challenges understanding complex social nuances, sequencing social responses, and a general reluctance to engage in school-related activities (APA, 2013; Lewis, Shapiro, & Church, 2013). Linked to EF deficits, children with SLD may have difficulties with perspective-taking and interpreting body language and facial expressions (Lewis et al., 2013). The social communication of children with SLDs may appear to be delayed, odd, or unusual (Marshall, Harcourt-Brown, Ramus, & Van der Lely, 2009). However, these deficits are typically linked to auditory processing and vocabulary deficits (APA, 2013; Pennington, 2008), rather than the inherent social difficulties or stereotyped language of ASD. Also, many social difficulties may be secondary to emotional and behavioral challenges that result from school failure (Lewis et al., 2013). Finally, children with SLD are not known to have difficulties with social

reciprocity, eye contact, incorporating facial expressions, imitation, or to use odd or stereotyped words or phrases.

Children with SLD tend to have elevated scores on measures of sensory processing including tactile seeking and avoidance and general low-energy behaviors (O'Brien et al., 2009; Pennington, 2008). However, no other striking sensory challenges or RRBs are typically noted in the SLD population. A lack of RRBs may suggest that the root of a child's school difficulties can be attributed to SLD rather than ASD. However, one should be careful if symptomology indicates that a condition that does present with RRB-like behaviors, such as ADHD or anxiety, is comorbid with SLD.

Children with SLD may also present with several ASD-associated cognitive, emotional, behavioral, and motor characteristics, though qualitative differences in how these symptoms manifest differentiate the two conditions. Both children with ASD and those with SLDs have uneven cognitive profiles. However, the cognitive strengths and weaknesses observed in children with SLDs are generally strongly linked to their academic profiles. For instance, children with math-related SLD may have poor visuo-spatial reasoning, whereas children with disorders in phonological awareness tend to have intact nonverbal abilities (Naglieri, 2016; Pennington, 2008). Additionally, while children with ASD generally have strengths in rote memorization and deficits in recall of personal experiences, the opposite is true for children with SLD (APA, 2013; Lewis et al., 2013). Theory of mind and perspective-taking challenges are observed in both conditions, however in SLDs these deficits are more likely linked with poor sequencing and EF challenges rather than a true deficit (Lewis et al., 2013). While the academic profile of a

student with SLD is highly dependent on the subtype, some characteristics that generally differ from those seen in ASD include stronger comprehension than decoding abilities, early difficulties in rhyming or counting, and math difficulties that are due to inherent deficits rather than inflexibility and poor comprehension (APA, 2013; Lewis et al., 2013).

Linked to both EF deficits and school failure, children with SLD may demonstrate a range of behavioral and emotional concerns that at first glance could be mistaken for symptoms of ASD. The most important differentiating factor is that many of these behavioral and emotional challenges tend to develop secondary to school failure and EF challenges and for children with SLD: One would expect a slow progression of concerns as academic demands increase (Lewis et al., 2013; Pennington, 2008).

Finally, though the adaptive profiles and fine motor abilities of children with SLD may be more impaired than their typically developing peers, there are likely not the motor concerns (APA, 2013; Pennington, 2008) or social-adaptive deficits and wide gap between cognitive and adaptive abilities (Backenson et al., 2015) as seen in ASD. Table 9 summarizes the traits of SLDs as they relate to ASD.

***Nonverbal learning disability.*** NVLD is the least common and least understood of all the learning disabilities (Davis & Broitman, 2011). Though not included in the *DSM-V*, students who demonstrate the characteristics of NVLD can still qualify for special education services under the SLD criteria if academic challenges are the most pressing need. Children with NVLD have near-identical profiles to those with ASD in the realm of social communication including: poor pragmatic skills and use of personal

Table 9

*ASD-Like Characteristics of SLD*

Social Communication	More likely to be rejected or ignored by their peers; frequently described as odd or socially maladjusted; difficulty maintaining friendships; challenges understanding complex social nuances, sequencing social responses; general reluctance to engage in school-related activities; difficulties with perspective-taking and interpreting body language and facial expressions; early language delays; articulation concerns; vocabulary and grammar deficits; difficulty processing auditory information; odd or unusual verbal responses; unusual speaking patterns; unusual word pronunciation; lack of early gesture use; pragmatic difficulties; difficulty effectively using prosody; lack of symbolic play and communicative gestures	APA, 2013; Lewis et al., 2013; P. Lyytinen, Poikkeus, Laakso, Eklund, & H. Lyytinen, 2001; Marshall et al., 2009; Pennington, 2008; Unhjem, Eklund, & Nergård-Nilssen, 2014;
RRBs	Elevated scores on measures of sensory processing; low activity levels in general	O'Brien et al., 2009; Pennington, 2008
Associated Symptoms	Uneven cognitive profiles; poor theory of mind and perspective-taking; inattention; difficulty inhibiting irrelevant stimuli; poor cognitive flexibility; impulsivity in problem-solving; frequent errors in work; poor metacognition and self-monitoring; difficulties planning and monitoring goals; avoidance of academic activities; oppositional and disruptive behavior; low self-esteem; low frustration tolerance; somatic responses,; fear of failure; co-existing diagnoses may include depression, anxiety, and ADHD	APA, 2013; Backenson et al., 2015; Lewis et al., 2013; Pennington, 2008; Watson & Gable, 2013;

of gesture and facial expression, difficulty with conversation initiation and maintenance, and verbal and social self-monitoring (Casey, 2012; Davis & Broitman, 2011; Semrud-Clikeman, Walkowiak, Wilkinson, & Minnie, 2010; Semrud-Clikeman, Fine, & Blesdoe, 2014). And though children with NVLD are thought to experience typical types emotions in response to situations, they may have difficulty expressing their emotions, have

heightened emotional responses, and tend to lack understanding of emotions in self and others (Saulnier & Ventola, 2012; Semrud-Clikeman et al., 2010); Semrud-Clikeman et al., 2014).

Children with NVLD may also demonstrate RRBs including obsessions or preoccupations, rigidity and anxiety in novel situations, difficulty with transitions, motoric restlessness, and sensory processing differences (Casey, 2012; Davies & Tucker, 2010; Davis & Broitman, 2011; Semrud-Clikeman et al., 2010). Early acquisition of a wealth of factual information and vocabulary is common, though these tend to be less narrowly focused than in ASD (Semrud-Clikeman et al., 2014).

Due to the numerous overlapping symptoms between ASD and NVLD, some experts wonder if a separate diagnostic category is necessary (Pennington, 2008). Others posit that the unique cognitive and motor profiles and the subtle qualitative differences in social interaction in children with NVLD is a clear indicator that it is a distinct condition (Davis & Broitman, 2011; Semrud-Clikeman et al., 2010). Following is a brief discussion of the characteristics shared by NVLD and ASD. Table 10 summarizes distinguishing characteristics.

Table 10  
*Characteristics That distinguish NVLD From ASD*

<u>Distinguishing Characteristics</u>		
Social Communication	More socially adept when 1:1 with peers, good sense of humor and understanding of puns and word play, can share enjoyment with others, invested in the feelings of others, no repetitive use of words or echolalia, increased sensitivity to peer rejection, social deficits secondary to learning deficits.	Davis & Broitman, 2011; Mamen, 2007; Saulnier & Ventola, 2012; Semrud-Clikeman et al., 2010;

Restricted and Repetitive Behaviors	Less likely to memorize and repeat scripts or facts about areas of interest, self-stimulatory and repetitive mannerisms are rare, no preoccupation with parts of objects or circumscribed interests.	Casey, 2012; Davis & Broitman, 2011; Saulnier & Ventola, 2012; Semrud-Clikeman et al., 2010;
Cognition	Strengths in verbal and auditory learning, memory, processing and attention; can more easily generalize skills. Weaknesses in visual-spatial processing, visual attention, and nonverbal problem-solving, Little interest in puzzles, drawing, or other spatial tasks, verbal learners.	Casey, 2012; Davis & Broitman, 2011; Semrud-Clikeman et al., 2010
Academics	Strengths in decoding, spelling, and phonics. Weaknesses in all aspects of mathematics, geography, and science (though may use strong verbal skills to compensate until 3 <sup>rd</sup> grade).	Casey, 2012; Saulnier & Ventola, 2012
Behavior and emotions	No characteristic evidence of highly disruptive behaviors such as aggression, elopement, or self-injury. Type of emotion generally matches the situation (but expression and/or intensity may be inappropriate).	Semrud-Clikeman et al., 2010
Motor	Tend to be sedentary in early and later childhood and will point or ask rather than walk or crawl to desired items, cannot tactilely distinguish items without looking at them, poor left/right discrimination, may get lost easily.	Davis & Broitman, 2011; Mamen, 2007; Saulnier & Ventola, 2012; Semrud-Clikeman et al., 2010;

**Emotional disability.** The IDEA (2004) definition of ED includes: a) an inability to learn and maintain satisfactory interpersonal relationships; b) inappropriate types of feelings under normal circumstances including depression or fears, and may include schizophrenia; and c) have an inability to learn that is not due to social maladjustment (IDEA, 34 C.F.R., Section 300.8 (c)(4)). The qualifiers of ED, more than any other IDEA (2004) category, seem to be most interchangeable with those of ASD and thus require careful consideration when differentiating between the two. For instance, when examining a child’s “inability to form interpersonal relationships” one may need to take

careful note of qualitative differences in the source of such difficulty. Whereas a child with ASD might fail to form relationships due to an inability to understand the perspective of others and a tendency to be perceived as awkward, a child with ED may experience relationship challenges due to behaviors and emotions that distance him or herself from others such as aggression, moodiness, or fears. Further adding to diagnostic complexity, many states add additional descriptive language to their criteria that may be easily confused with symptoms commonly observed in ASD. Table 11 outlines specifiers added to IDEA (2004) ED criteria in Colorado that may be confused with key ASD diagnostic terminology.

Approximately 6% of children who receive special education are eligible through the ED category (Children and Youth with Disabilities, 2016). Children who qualify for ED do not need a particular clinical diagnosis as long as sufficient data show that they meet IDEA (2004) and state-specific criteria. ED, in fact, encompasses several clinical conditions. Clinical conditions that may lead to an inability to learn and form relationships at school and that share symptomology with ASD include: Disorders of anxiety (General Anxiety Disorder [GAD], Obsessive Compulsive Disorder [OCD], Selective Mutism [SM], Social Phobia [SocP]), Depressive disorders (Major Depressive Disorder [MDD], Disruptive Mood Dysregulation Disorder [DMDD], Dysthymia), Bipolar Disorder (BPD), Childhood Onset Schizophrenia (COS), other disorders of behavior (BD), and Disorders of Trauma and Attachment (DTA). All of the conditions listed above share some degree of diagnostic terminology that may be mistaken for

symptoms of ASD and lead to misidentification. Indeed, children with many of these EDs will obtain significant scores on popular ASD screening measures (Moody et al., 2017;

Table 11

*ED Specifiers in Colorado as They Pertain to ASD Diagnostic Terminology*

<u>ASD Terminology</u>	<u>Colorado ED Specifiers</u>
Social-Communicative Challenges	Lack of friendships, challenges with give and take, withdrawal from peers, lack of emotional expression, confused verbalizations, flat or blunted affect
Restricted and Repetitive Behaviors	Strange or bizarre behaviors, verbalizations or vocalizations, excessive fantasy, ritualistic body movements, preoccupations, strange posturing, avoidance of anxiety-provoking stimuli, hypervigilance, tics, eye blinking, out of control vocalizations
Associated Features (Cognition, Emotion, Behavior)	Aggression, emotional overreactivity, agitation, inattentive behaviors

(Colorado Department of Education, Exceptional Student Services Unit, 2015)

Moul, Cauchi, Hawes, Brennan, & Dadds, 2015). The diagnostic indicators of each of these conditions will be discussed briefly below.

***Disorders of anxiety.*** Anxiety disorders are characterized by persistent fear or worry that is out of proportion to the threat or perceived threat and that causes disruption in a person's everyday functioning (APA, 2013). The symptoms of many anxiety disorders, particularly those of a social nature, are linked heavily with ASD, and as such hard to differentiate (Kerns & Kendall, 2014). In fact, 42-50% of youth with anxiety disorders meet ASD criteria on autism screeners, including measures of social communication and RRBs (Cholemkey, Kitzrow, Rohrman, & Freitag, 2014; Cholemkey, Mojica et al., 2014; Halls, Cooper & Creswell, 2015; Settapani, Puleo, Conner, & Kendall, 2012).



Three additional anxiety-based disorders that share symptoms with ASD include SM, SocP, and OCD. SM is a disorder linked with social anxiety and characterized by a persistent failure to speak in some situations but not in others that is not better explained by language or developmental delay (APA, 2013). Commonly, children with SM will speak at home but not at school. SocP is characterized by a persistent and marked fear of performing in social situations that leads to avoidance, panic symptoms, or negative behaviors (APA, 2013). Finally, OCD is an anxiety-based disorder characterized by obsessions (recurrent and intrusive thoughts) that lead to compulsions (repetitive behaviors) that an individual feels compelled to perform in order to alleviate the intrusive thoughts or to keep a negative event from occurring (APA, 2013). The characteristics of SM, SocP, and OCD that may be mistaken for those of ASD are summarized in Table 12.

Though at first glance differentiating ASD from anxiety disorders in general, and SocP, SM, or OCD in particular, may appear to be an impossible task, several features of each condition may assist in differentiation.

Children with all forms of anxiety disorders may display difficulties engaging in reciprocal social interactions and may perseverate on thoughts or topics, have compulsions or ritualistic behavior, demonstrate rigidity and resistance to change, withdrawal from others, and engage in repetitive motor movements (Huberty, 2012; Kerns & Kendall, 2014; Towbin, Pradella, Gorrindo, Pine & Leibenluft, 2005; Voisin & Brunel, 2013). Compared to children with ASD, however, these behaviors are typically linked to experiencing or trying to avoid anxiety-provoking stimuli and may be

Table 12  
ASD-Like Characteristics of Anxiety Disorder

<u>Anxiety Disorder</u>	<u>Social-Communication</u>	<u>RRBs</u>	<u>Associated Symptoms</u>	
SM and SocP	Lack of social initiation, failure to speak, isolation and withdrawal, poor social skills, often bullied, limited gesture use, flat affect, reduced eye contact and social reciprocity, socially controlling or submissive, low speaking volume, difficulty playing with peers, decreased spontaneous imitation, difficulty understanding the nature of relationships, poor social cognition	Compulsive traits, sensory sensitivities, obsessions, avoidance of eating or using the bathroom, rigid posture, increased fidgeting, resistance to change or new situations	Tantrums, oppositional behavior, elopement, academic challenges, adaptive weaknesses, comorbid depression and anxiety, working memory deficits, may appear to have expressive language deficit, difficulty processing emotions, difficulty interpreting others' intentions	Amir & Bomyea, 2011; APA, 2013; Carbone et al., 2010; Hofmann & Bitran, 2007; Jouni, Amestoy, & Bouvard, 2016; Kearney, 2010; Tyson & Cruess, 2012; White, Schry, & Kreiser., 2014;
OCD	Repetitive thoughts and speech, avoidance of people that trigger compulsions, obsessions may interfere with social relationships and communication, reciprocity and pragmatic challenges	Restricted interests, repetitive behaviors, distress when repetitive behaviors are blocked, hoarding, rigid adherence to rules, ritualistic behavior, perfectionism, resistance to change and uncertainty, avoidance of places or things that trigger compulsions	Decreased adaptive skills, self harm, aggression toward others, EF deficits in planning, organization, shifting, flexibility, working memory, inattentive, may appear self-absorbed	APA, 2013; Cullen et al., 2008; Jiujiyas, Kelley, & Hall, 2017, Kashyap, Kumar, Kandavel, & Reddy, 2013; Lebowitz, Storch, MacLeod, & Leckman, 2015; McCloskey, Hewitt, Henzel, & Eusebio, 2009; Paula-Perez, 2013; Wu, Rudy, & Storch, 2014;

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minimized when there is no perceived threat. Both children with ASD and those with anxiety disorders are prone to fears and phobias, but children with ASD are more likely to demonstrate unusual fears, such as those of mechanical objects, and not as likely to develop fears around social evaluations (Kerns & Kendall, 2014). Children with anxiety disorders may be more inhibited in general and they may appear to have deficits in eye contact, imagination, conversation skills, spontaneous imitation, initiation, sharing with others, or appropriate social responses (Huberty, 2012; Kerns & Kendall, 2014; Voisin & Brunel, 2013).

However, in children with anxiety disorders, one would expect to see these challenges dissipate in familiar, comfortable environments, whereas they would tend to be more pervasive in ASD. Cognitive distortions are common amongst children with anxiety disorders (Huberty, 2012) and those that are aimed at another person may be mistaken for TOM deficits or lack of understanding of the social nuances of others. Finally, when experiencing anxiety, children with anxiety disorders may demonstrate impaired fine and gross motor movements along with difficulty shifting attention, decreased response inhibition, and impaired executive control in general (Visu-Petra, Miclea, & Visu-Petra, 2013). These symptoms of anxiety should not be confused with the more pervasive ASD traits. Overall, though children with anxiety may demonstrate many key social-communicative, RRB, and associated features of ASD, it is the connection between these behaviors and anxiety-provoking stimuli that is the key to differentiation.

When attempting to differentiate ASD from anxiety disorders, one may also take note of ASD-specific behaviors that do not generally occur in children with anxiety

alone. Children with anxiety alone will not typically demonstrate use of another's body as a tool, pronoun reversal, sensory impairments, inappropriate facial expressions, stereotyped language, or inappropriate questioning (Towbin et al., 2005; Voisin & Brunel, 2013). When not experiencing anxiety, these children may demonstrate social smiling, offering to share with others, gestures, pointing, interest in other children, and creative play (Towbin et al., 2005; Voisin & Brunel, 2013). Consider, if the assessment process in and of itself is anxiety-provoking, any of these symptoms may or may not be observed. To assist in differentiation from ASD, an examiner should be familiar with differentiating features of specific anxiety disorders, including SM, SocP, and OCD.

A key differentiating feature in SM/SocP is that social deficits including lack of initiation and response, flat affect, decreased eye contact, and limited reciprocity stem from anxiety surrounding social interactions, rather than lack of interest or self-absorption as seen in ASD (Tyson & Cruess, 2012; White et al., 2014). Accordingly, one may notice the social-communicative skills of a child with SM or SocP increase when he or she is comfortable, whereas the deficits tend to remain static in a child with ASD. Furthermore, in a social situation, a child with SM or SocP may cry, attempt to run away, or otherwise avoid interaction, but a child with ASD might ignore others, engage in repetitive activities, or demonstrate socially inappropriate behaviors (Tyson & Cruess, 2012). Other social deficits may occur due to inhibition rather than actual deficit. For instance, a child with a SM or SocP may avoid eye contact, but does not show the same tendency to study one's mouth when engaged in conversation as does a child with ASD (Tyson & Cruess, 2012). Likewise, difficulty with conversation, affect, gesture use, and

naturalistic imitation may arise from self-consciousness rather than lack of understanding of the social importance of such actions. Self-consciousness and worry about what others think may be a key differentiator as children with ASD struggle with considering and interpreting others' thought. Finally, children with SM or SocP develop social deficits in a cyclic pattern over time where avoidance leads to lack of experience, which leads to social deficits, which leads to lack of confidence and increased social avoidance. Children with ASD, however, have inherent difficulties relating to others noticed early in development (Tyson & Cruess, 2012; White et al., 2014).

It is the tendency to confuse obsessions and compulsions with RRBs that generally interferes with differentiating OCD from ASD. In fact, close to 40% of children with OCD have elevated scores on ASD screeners that measure RRB (Stewart et al., 2016), making ASD screeners a less valid diagnostic tool for this population. The key to differentiating RRBs from obsessions and compulsions lies in examining the function behind the behaviors as well as the complexity of the behaviors themselves (Jiujiias et al., 2017). Children with ASD find pleasure in their repetitive thoughts and behaviors, seek out triggers for them, and may use them as a form of self-stimulation, stress-reduction, comfort, or to create a sense of familiarity and order (Saulnier & Ventola, 2012; Wu et al., 2014). On the other hand, children with OCD are distressed by their obsessive thoughts and want them to stop (Wu et al., 2014). These thoughts are pervasive, intrusive, tied to negative events, and lead to behavioral compulsions that the individual feels may stop the thoughts or negative events from occurring (Paula-Perez, 2013; Wu et al., 2014). Whereas the RRBs of children with ASD tend to involve simple motor movements (e.g.

twirling, spinning, or lining up objects), those of children with OCD tend to be more complex (e.g. hand washing, arranging and rearranging objects, compulsive cleaning, etc.) (Jiujias, et al., 2017). Finally, there is a level of self-awareness around the obsessions and compulsions in OCD that is not seen in ASD. Typically, children with OCD understand that the behaviors are odd, may set them apart from others, and can describe triggering thoughts (Paula-Perez, 2013). Examination of social and communicative abilities may also assist in differentiating ASD and OCD. Children with OCD may have difficulties in peer relationships or communication due to their compulsions, but otherwise generally have an intact understanding of the social world, do not demonstrate stereotyped language, pronoun reversal or echolalia, and typically have average speech and language development (Paula-Perez, 2013; Wu et al., 2014).

To conclude, children who have anxiety disorders; particularly those who have symptoms of SM, SocP, and OCD may be misclassified as having ASD due to numerous commonalities in symptom terminology as well as the tendency for ASD screeners to have significant results for children with anxiety disorders. It will be vital for diagnosticians to familiarize themselves with the qualitative differences in presentation in order to provide the most accurate classification.

***Depressive and bipolar disorders.*** Like anxiety disorders, depressive and bipolar disorders have symptom presentation that may be confused with ASD. Depressive disorders that may be diagnosed in childhood include Major Depressive Disorder, Dysthymia, and Bipolar disorder. Table 13 highlights core characteristics of depressive and bipolar disorders as they present in children.

Table 13  
*Features of Depressive and Bipolar Disorders in Children*

<u>Disorder</u>	<u>Core Characteristics</u>
MDD and Dysthymia	MDD and Dysthymia are characterized by a persistent depressed mood (in Dysthymia, mild to moderate depression persists for more than 2 years) that leads to significant impairment in social or academic functioning. In children, depression may manifest as irritability, inattention, or aggression.
BPD	BPD is characterized by cyclic episodes of major depression and mania. In children, depressive episodes may manifest as irritability and mania may manifest as uncharacteristic giddy or goofy behavior, grandiosity, and/or inappropriate or dangerous behavior.

APA, 2013

Up to 62% of children with depressive, bipolar, and mood dysregulation disorders have elevated scores on ASD screeners of social communication and RRB (Pine, Guyer, Goldwin, Towbin, & Leibenluft, 2008; Towbin et al., 2005), making the use of those tools invalid without other means of differentiating qualitative dissimilarities in symptom presentation. However, depressive and BPD are often left out as potential differentials for ASD by clinicians (Kroncke et al., 2016). Children with depressive disorders may present with corresponding anxiety, mania, atypical features, or psychosis (APA, 2013), making differentiating these conditions from ASD even more challenging. Table 14 highlights symptom terminology that both ASD and depressive and bipolar disorders have in common. Bear in mind that DMDD will share all the features of MDD but has additional defining characteristics.

As one can see from the examples provided in Table 14, a critical component of ASD evaluation is the consideration of depressive and bipolar disorders as possible differentials. Fortunately, several qualitative factors may assist evaluators in differentiating ASD from depressive and bipolar disorders.

Children with depressive disorders may have significant challenges forming friendships, communicating with others, and may not demonstrate nonverbal behaviors such as gesturing, facial expression, vocal affect, or naturalistic imitation of others (APA, 2013; Huberty, 2012). They may also appear to have deficits in social and independent play, creativity, and imagination (Mills & Baker, 2016; Saulnier & Ventola, 2012). However, social-communicative and play challenges likely develop as depression worsens, rather than being present since an early age as expected in ASD. Children with depression experience a lack of initiation in general (Saulnier & Ventola, 2012) and accordingly may not seek out others for social interactions or engage in showing or sharing during play. This is different than the lack of skill, interest in others, or preoccupations that keep a child with ASD from seeking social engagement. Compared to a child with ASD, a child with depression will speak with few words rather than at great length and will likely not say things that are inappropriate or stereotyped (Elliott et al., 2011). However, due to difficulties with attending (Mills & Baker, 2016), children with depressive disorders may appear to say things that are odd or out of context. Pronoun reversal and echolalia are not typical in this population.

Children with depression may also demonstrate repetitive behaviors that resemble the RRBs of ASD. However, upon close examination, one may notice subtle qualitative differences in presentation. Rumination is common in depression (APA, 2013) and a child may appear to be perseverating, but these repetitive thoughts and preoccupations will tend to be focused around negative events rather than restricted interests. In fact, one will notice a lack of interest in previously enjoyable activities in children with depressive



Table 14

*ASD-Like Characteristics of Depressive and Bipolar Disorder*

<u>Disorder</u>	<u>Social-Communication</u>	<u>RRBs</u>	<u>Associated Symptoms</u>	
MDD	Withdrawal, social impairments, social distress, victims of bullying, lack of eye contact, initiation, and reciprocity, differences in volume and tone of voice, lack of vocal intonation and inflection, reduced speech, lack of interest in play, limited spontaneous imitation	Obsessive rumination and preoccupations, rigidity, psychomotor agitation or retardation, food aversions or avoidance, pacing, hand-wringing, rocking, pulling or rubbing skin or objects, self-harm	Impaired emotional awareness, flat affect, inattention, anger and irritability, reward-seeking, poor emotional regulation, emotions that do not match the context, poor empathy, EF difficulties, adaptive and self-care deficits, difficulty producing autobiographical memories	APA, 2013; Domes et al., 2016; Elliott, Zahn, Deakin, & Anderson, 2011; Huberty, 2012; Mills & Baker, 2016; Pine et al., 2004; Pine et al., 2008; Saulnier & Ventola, 2012; Wolkenstein, Schönenberg, Schirm, & Hautzinger, 2011
BPD	Flights of ideas hard to follow, impaired relationships, inappropriate speech, grandiosity, one sided conversations, unusual gestures, facial expressions do not match situation, difficulty handling conflict, poor reciprocity	Intense focus on projects, preoccupations with inappropriate topics, self-injury, sharper sense of smell and vision, bizarre behaviors, constant activity, bizarre persistent thoughts. BPD with psychotic features: echolalia, strange and repetitive movements or posturing	Inattention and distractibility, physical rage and aggression, sleep disturbance, difficulty processing emotions, facial expressions, and tone of voice, irrational beliefs, EF difficulties, poor self-care,	APA, 2013; Deveney, Brotman, Decker, Pine, & Leibenluft, 2012; Elliott et al., 2011; Hart, Brock, & Jeltova, 2014; McCloskey et al., 2009; Rich et al., 2008

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disorders (APA, 2013), rather than the intense preoccupations seen in ASD. Children with depression may also engage in repetitive motor behaviors such as pacing or rocking (APA, 2013), but these will be linked to negative mood states and qualitatively different than repetitive behaviors seen in ASD. Finally, children with depressive disorders alone do not typically demonstrate rigidity around schedules or resistance to change.

Children with depressive disorders may also appear to demonstrate several non-diagnostic features associated with ASD such as difficulties with emotional regulation, recognition of tone of voice and facial expression, and theory of mind (APA, 2013; Lopez-Duran, Kuhlman, George, & Kovacs, 2013; Wolkenstein et al., 2011). Difficulty with emotional regulation is common, but rather than the odd or unusual emotional responses seen in ASD, a child with a depressive disorder will have persistently negative or flattened reactions to daily experiences. There are also qualitative differences in emotional recognition. A child with a depressive disorder may ascribe negative emotions to neutral or happy faces or tones of voice (Elliott et al., 2011; Lopez-Duran et al., 2013), rather than a persistent and generalized difficulty with recognition of emotions as frequently seen in ASD. Finally, this population may struggle on tasks that measure theory of mind, but this is generally linked to an inability to 'deal' with the emotions of others, rather than a lack of ability (Wolkenstein et al., 2011). Overall, though children with depression may demonstrate many key social-communicative, RRB, and associated features of ASD, important considerations in differentiation include whether the behaviors are consistently negative in nature and whether the child has struggled since early childhood or if the behaviors developed along with the depressive disorder.

Differentiating ASD from BPD will have all the same challenges as differentiating ASD from depression, but the addition of manic and in some cases psychotic symptoms adds another layer of complexity. Though many features of mania and psychosis may present as odd and unusual social behavior or RRB, a key to differentiation may lie in the magnified intensity of the symptomology as well as the characteristic “ups and downs” of BPD.

In summary, consideration of depressive and bipolar disorders is often left out of ASD differentiation practices. However, it is clear that the symptom terminology of these conditions overlaps with that of ASD in several important areas. In fact, the symptoms can appear so similar on paper that ASD screeners may even misidentify a child as having ASD when depression, DMDD, or BPD is actually the root of the child’s difficulties. Clinicians may not be able to rely on ASD screening tools and instead may need to identify subtle differences in symptom presentation to make the correct diagnosis.

***Child-onset schizophrenia.*** COS is characterized by hallucinations, delusions, and/or disorganized vocal and motor behavior (APA, 2013). COS and ASD share both neurological and genetic characteristics resulting in substantial phenotypic overlap (Bevan Jones, Thapar, Lewis, & Zammit, 2012; Jalbrzikowski et al., 2013; Parellada et al., 2017). COS is a unique differential to ASD in that differentiation of the two conditions requires almost pure clinical judgment in combination with a careful developmental and family history (Bevan Jones et al., 2012; Reaven et al., 2008; Saulnier & Ventola, 2012). Even the most intensive of ASD diagnostic tools, the ADOS-2 and ADI-R, cannot reliably differentiate the two conditions (Reaven et al., 2008). Further

complicating the challenges in differentiating COS from ASD is a prodromal period that last up to 6 years prior to full onset of COS (Li, Pearrow, & Jimerson, 2010). During this prodromal period, a child develops symptoms that almost entirely mimic those of ASD including unusual preoccupations, RRBs, sensory sensitivity, language delay, and social impairments (Bevan Jones et al., 2012; Li et al., 2010; Rapoport, Chavez, Greenstein, Addington, & Gogtay, 2009). In fact, the odds that a child will develop COS by age 12 are greatly increased when mothers report traits of ASD at age three (Bevan Jones et al., 2012). Overall, the numerous shared characteristics of ASD and COS may make early differentiation very challenging and misdiagnoses common. This diagnostic overlap also highlights the importance of viewing not only initial evaluations, but also reevaluations of children with ASD through a differential lens, as full COS symptoms may not develop until 6-12 years of age (Bevan Jones et al., 2012; Li et al., 2010). Table 15 summarizes the shared characteristics of ASD and COS as well as areas for which careful questioning can highlight differences.

Table 15  
*Shared Characteristics and Distinguishing Questions of COS and ASD*

Shared Characteristics	Distinguishing Questions (YES answers lean toward ASD)	
<b>Social</b>		
Disorganized speech	Is there little to no involvement with or monitoring of others?	APA, 2013; Berman et al., 2016; Bevan Jones et al., 2012;
Unusual prosody	Is there stereotyped language?	Couture et al., 2010;
Lack of gestures	Is the play repetitive?	Dvir & Frazier, 2011;
Lack of social interest	Does the child not change behavior depending on how well they know someone?	Jalbrzikowski et al., 2013; Li et al., 2010;
Inappropriate affect and monotone speech	Is the quality of social interactions awkward?	Reaven et al., 2008;
Lack of interpersonal insight	Is the scripted language from a cartoon or program (as opposed to a hallucination)?	Saulnier & Ventola, 2013; Trammell, Wilczynski, Dale, & McIntosh, 2013;
Difficult to form relationships		
Distracted by internal events		

Poor eye contact  
Scripted language  
Nonsensical language  
Solitary play and withdrawal  
Social anxiety  
Poor understanding and expression of emotion  
Echolalia

Is the speech characterized by jargon (as opposed to disorganized thoughts)?

**RRB**

Abnormal motor behavior  
Bizarre posturing  
Stereotyped movements  
Sensory sensitivity  
Perseveration  
Repetitive behaviors

Is the perseveration linked to an intense interest grounded in reality (as opposed to a hallucination)?  
Does the repetitive behavior seem to fulfill a function?

APA, 2013; Bevan Jones et al., 2012; Li et al., 2010; Saulnier & Ventola, 2013; Tin et al., 2018

**Associated Features**

Decreased adaptive functioning  
Poor hygiene,  
Executive functioning, attention and working memory deficits  
Poor theory of mind  
Increased attention to irrelevant stimuli  
Sleep disturbance  
Fine and gross motor delays; poor motor coordination  
Mood and behavioral challenges  
Lack of empathy

Is there a relative strength in declarative memory?  
Is there a pattern of cognitive and academic strengths and weaknesses (as opposed to gradual decline)?

APA, 2013; Bevan Jones et al., 2012; Couture et al., 2010; Dadds et al., 2009; Li et al., 2010

**Other behavior disorders.** For the purposes of this paper, behavior disorders (BDs) include non-categorical EDs as well as disruptive behavior disorders (DBDs). DBDs occur along a continuum and include Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), Disruptive Mood Dysregulation Disorder (DMDD), and Intermittent Explosive Disorder (IED) (APA, 2013; Hughes, Crothers, & Jimerson, 2008; Matthys & Lochman, 2009). DBDs are characterized by a lack of behavioral and

emotional self-control that violates the rights of others and conflicts with societal norms (APA, 2013). Table 16 highlights core DSM-V criteria for the different DBDs.

Table 16  
*Core Features of DBDs in Children*

<u>Disorder</u>	<u>Core Characteristics</u>
ODD	ODD is characterized by an angry, irritable, and argumentative personality. Deliberate defiance of authority, annoyance of others, and vindictiveness also occur. Children with ODD believe their behaviors are an appropriate response to unjustness. Family lives of children with ODD are often disorganized.
IED	IED is characterized by a history of angry and explosive outbursts. These outbursts are out of proportion to their triggers and are based in anger and impulsivity, rather than anxiety or frustration.
CD	CD is characterized by a persistent violation of the rights of others or of societal norms and can include lying, cheating, theft, vandalism, aggression, threatening, cruelty to animals, truancy, or running away from home. Children with CD may demonstrate a lack of remorse or guilt, or thrill-seeking personalities.
DMDD	Children with DMDD have a persistent irritable mood interspersed with at least 3 weekly severe tantrums or acts of aggression. These tantrums are inconsistent with the child's age or developmental level.

APA, 2013

Though at first glance, there seems to be little that ASD has in common with BDs, several associated characteristics may make differentiation challenging. In fact there are so many commonalities that children with BDs frequently obtain elevated scores on ASD screeners (Cholemkery, Kitzerow et al., 2014; Sturm, Rozenman, Chang, McGough, McCracken, & Piacentini. 2018). The presence of callous and unemotional traits and comorbid ADHD enhance ASD-like symptoms in children with BDs (de la Osa, Granero, Domenech, Shamay-Tsoory, & Ezpeleta, 2016; Gadow & Drabick, 2012; Gremillion & Martel, 2013; O'Kearney, Salmon, Liwag, Fortune, & Dawel, 2017). Table 17 outlines characteristics of BDs as they relate to the social-communicative, RRB, and associated characteristics of ASD.

Table 17  
*ASD-Like Characteristics of BDs*

Social Communication	Marked disruption in family and peer relationships, poor social communication, awareness, and cognition, more likely to be rejected or ignored by their peers; poor pragmatic skills; limited ability to predict how others will respond to ones' behavior; difficulty with social behaviors such as entering a group, starting a conversation, asking questions, listening to others, showing interest in others, and sharing; peer rejection; misperception of the intent of others; difficulties with reciprocal social interactions; flat affect; stereotyped language; inappropriate intonation; difficulty building rapport with others; poor understanding of social relationships	APA, 2013; Axelson, 2013; Cholemkery, Kitzerow et al., 2014; de la Osa et al., 2016; Dinolfo & Malti, 2013; Dougherty et al., 2014; Gilmour, Hill, Place, & Skuse., 2004; Gremillion & Martel, 2013; Matthys & Lochman, 2009; Sturm et al., 2018
RRBs	Poor sensory regulation, perseveration on reward-seeking behaviors	Gouze, Hopkins, Lebailly, & Lavigne, 2009; Sturm et al., 2018
Associated Symptoms	Lack of sympathy; EF deficits; cognitive inflexibility; working memory and attention challenges; high emotional reactivity; poor frustration tolerance; difficulty in emotional identification; aggression; tantrums; increased rates of comorbid anxiety and depression; poor theory of mind and perspective-taking; lack of empathy, difficulty integrating context; language delay; poor adaptive functioning, severe aggression, low frustration tolerance, high rates of comorbidity with ADHD, ODD, Anxiety	APA, 2013; Axelson, 2013; Cholemkery, Kitzerow et al., 2014; de la Osa et al., 2016; Dinolfo & Malti, 2013; Dougherty et al., 2014; Gilmour et al., 2004; Mandell, Ittenbach, Levy, & Pinto-Martin, 2007; Matthys & Lochman, 2009; O'Kearney et al., 2017; Schoemaker, Mulder, Deković, & Matthys, 2013; Sturm et al., 2018

As evidenced by Table 17, differentiating ASD from BDs may depend on the presence or absence of RRBs. An additional component to differentiation may lie in the function of the child's behaviors. Both children with DBDs and children with ASD may demonstrate disruptive, aggressive, or defiant behaviors. However, whereas the behaviors of children with DBDs tend to be willful and vindictive, centered around reward-seeking, or based on severe mood dysregulation, those of children with ASD tend to be rooted in

anxiety, rigidity, disengagement, and/or lack of social understanding (Kroncke et al., 2016; Matthys & Lochman, 2009). For instance, failure to follow directions in a child with DBD may be due to disobedience, whereas in a child with ASD it may be due to anxiety or being caught up in perseverative interests. Specific types of behaviors may also serve to differentiate the two conditions. Social norm and Rule-violating behaviors such as substance use, theft, thrill-seeking, promiscuity, deliberate vandalism, and lying are not common in ASD (APA, 2013; Hughes et al., 2008). Finally, one may notice the behaviors of a child with DBD changing over time from defiance and aggression to truancy, vandalism, and theft.

Key factors may also differentiate the social deficiencies of ASD from those of DBDs. Children with DBDs may experience a period of relatively typical social development prior to onset of the condition (Gilmour et al., 2004). The development of later social deficits may be due in part to disciplinary exclusion from key social experiences and social rejection (APA, 2013; Gilmour et al., 2004; Matthys & Lochman, 2009). Further, children with DBDs, unlike those with ASD, are more likely to have parents and siblings with antisocial characteristics, and as they age may develop some of these same behaviors (Hughes et al., 2008). Though friendships are rare in both ASD and DBDs, when children with DBDs do have friendships, they tend to have them with other disruptive or aggressive peers (APA, 2013; Hughes et al., 2008). Finally, interactions with both children with ASD and those with DBDs may feel uncomfortable. However, uncomfortable interactions with children with DBDs may be rooted in defiance, callousness, or mood instability, which is qualitatively different than the awkwardness



and aloofness that characterizes interactions with children with ASD. Overall, though there are several characteristics that children with ASD and those with DBDs have in common, examiners may notice differences in early social development, family characteristics, function and types of behavior, and quality of social interactions.

***Disorders of trauma and attachment.*** The diagnosis of DTA, which include Reactive Attachment Disorder (RAD), Disinhibited Social Engagement Disorder (DSED), and Post-Traumatic Stress Disorder (PTSD), require a history of severe neglect, abuse, or exposure to a traumatic event (APA, 2013). However, in cases where a child's history may be difficult to obtain, differentiation of these conditions from ASD is critical. There exists very little research that guides differentiation of DTAs from ASD (Sadiq et al., 2012). Further, assessments of ASD and RAD are ineffective at differentiating the two conditions (Davidson et al., 2015; Rutter et al., 2007; Sadiq et al., 2012). In fact, some experts believe that the most reliable method of differentiating DTAs from ASD in the absence of a child's history is the intuition of an expert examiner (Sadiq et al., 2012). Therefore, an in depth understanding of the symptomology of DTAs and their qualitative differences from those of ASD is essential for differentiation. Table 18 highlights the core symptomology as discussed in the *DSM-V*. In addition to several core characteristics of DTAs that are reminiscent of ASD, there exist numerous associated characteristics that may make differentiation of the two conditions even more challenging. Table 19 summarizes the shared characteristics of DTAs and ASD.

Table 18  
*Core Features of DTAs in Children*

<u>Disorder</u>	<u>Core Characteristics</u>
RAD/DSED	RAD is characterized by consistent social withdrawal, limited positive affect, and unexplained irritability, fearfulness, or sadness. DSED is characterized by non-discriminatory friendly or affectionate behavior and inauthentic expression of emotions. In both conditions, there must have been a history of extreme abuse, neglect, or emotional deprivation, AND/OR frequent changes in caregiver before the age of two. The criteria for ASD must not be met, the child must be at or above the mental age of 9 months, and the symptoms must have been observed before the age of five.
PTSD	The symptoms of PTSD occur after direct or indirect exposure to trauma and include recurrent memories, disassociation, intense reactions to or avoidance of trauma reminders, and increasing negative emotional states.

APA, 2013

Despite the shared characteristics listed in Table 19, there are several features of RAD and DSED that differentiate them from ASD. Even though standard assessments may not be able to differentiate the two conditions, there is a different quality of social interactions (Davidson et al., 2015). Some experts describe that interacting with a child with RAD has a “push-pull” (Kroncke et al., 2016, p. 281) quality, or feels that one is being manipulated. Though at first glance, indiscriminate friendliness seems like it would be specific to RAD/DSED, children with ASD can also demonstrate this quality if it is linked to their perseverative or sensory interests (Davidson et al., 2015). For instance, a child who is fixated on touching noses may approach several strangers and attempt to do so, or a child who needs proprioceptive input may sit on the laps of strangers. Children with RAD/DSED may demonstrate stereotyped movements and unusual fears or anxieties that manifest as rigidity or insistence on sameness (APA, 2013). However, there is no evidence of perseverative interests (APA, 2013). A final differentiating factor is that with

Table 19

*ASD-Like Characteristics of DTAs*

<u>Disorder</u>	<u>Social-Communication</u>	<u>RRBs</u>	<u>Associated Symptoms</u>	
RAD and DSED	Social withdrawal; minimal responsiveness to others; flat affect; lack of social reciprocity and relatedness; non-discriminatory social interactions, peer conflicts, poor understanding of the nature of friendship; poor awareness of social cues; difficulty integrating social experiences; poor eye contact	Fears and anxieties, stereotyped movements	Irritability, language delays, range of intellectual ability, wandering, poor emotional understanding, difficulty understanding contextual relationships; increased likelihood of anxiety and depression; lack of empathy; Difficulty processing complex information; developmental regression; EF difficulties; poor adaptive functioning	APA, 2013; Center on the Developing Child at Harvard University, 2012; Davidson et al., 2015; Green & Goldwin, 2002; Millward, Kennedy, Towlson, & Minnis, 2006; Pears, Bruce, Fisher, & Kim, 2009; Sadiq et al., 2012; Smyke, Dumitrescu, & Zeanah, 2002;
PTSD	Socially withdrawn; flattened or negative affect; uninterested in social participation; impaired social relationships; obsessive retelling of events; avoidance of people; poor eye contact	Repetitive play; avoidance of places, things, activities; food aversions; unusual fears; heightened response to environmental stimuli	Physical aggression; irritability; poor attention and concentration; sleep disturbances; poor adaptive functioning; academic skill deficits; regression; Higher rates of comorbid ADHD, DBDs, depression and anxiety; impulsivity	APA, 2013; Nickerson, 2009; Steuwe et al., 2014; Stavropoulos, Bolourian, & Blacher (2018)

familial stability and cognitive-behavioral or rational-emotive therapies, a child with RAD will show gradual improvements.

In cases of PTSD, one may discover that instances of social withdrawal, avoidance of people, places, and activities, attention difficulties, disassociation, and flattened affect, and skill regression occurred following the traumatic event (APA, 2013; Nickerson, 2009; Stavropoulos, Bolourian, & Blacher, 2018). When social history is unavailable, differentiation becomes slightly more challenging. Children with PTSD may show inconsistent social-communicative engagement and anxiety responses depending on the setting or level of trauma-linked arousal (Kroncke et al., 2016; Nickerson, 2009). One would not expect that social withdrawal linked to trauma would have the same awkward and inappropriate feeling that accompanies engaging with a child with ASD. There is no evidence that children with PTSD use stereotyped language, have pronoun reversal, difficulties understanding nonverbal communication, or unusual prosody. There also are key differentiating features in RRBs and repetitive play, which will be linked to the trauma rather than to a perseverative interest (APA, 2013; Stavropoulos, Bolourian, & Blacher, 2018). One's avoidance of triggering stimuli may seem like rigidity or insistence on sameness, but these behaviors will likely be inconsistent in children with PTSD. Perhaps the most telling differentiating feature is the ability of a child with PTSD to engage in complex pretend play, even if highly repetitive in nature (Stavropoulos, Bolourian, & Blacher, 2018). Behavioral challenges may occur during non-structured times, much like with ASD (Nickerson, 2009). However, in children with PTSD, these behaviors are linked to trauma triggers or thoughts and may have a feeling of panic,

anxiety, or disassociation, rather than a withdrawal into one's RRBs or difficulties with prediction (Nickerson, 2009). Finally, there is no pattern of cognitive strengths and weaknesses, poor theory of mind or motor challenges expected in children with PTSD, though poor concentration and disassociation may hinder a child's ability to comprehend complex topics or engage in complex motor movements. Overall, differentiation of ASD from DTAs in lieu of the availability of social history may prove to be a challenging endeavor. Familiarity with symptoms of each condition as well as the ability to notice subtle qualitative differences in social interaction styles may be an evaluator's best bet.

**Traumatic brain injury.** One in 550 children will experience a TBI so severe that it results in long-term disability (Jantz, Davies, & Bigler, 2014). Guidelines for TBI identification in the school setting generally mandate that there is credible history that a traumatic head injury occurred. Additional guidelines include: a) acquired injury to the brain (open or closed) caused by an external physical force; b) total or partial functional disability and/or psychosocial impairment that adversely affects a child's educational performance; c) impairments in one or more areas (e.g., cognition, language, executive functions, abstract thinking, problem-solving, sensory abilities, information processing, and speech); and d) exemptions for brain injuries that are congenital or degenerative, or induced by birth trauma (IDEA Regulations, 34 CFR, Section 300.8(c)(12)). These parameters make TBI differentiation from ASD a relatively simple task given a detailed health and medical history. However, some TBIs go undiagnosed and unreported due to factors such as cost of treatment, lack of knowledge about TBI, or fear of legal action (Jantz et al., 2014). Due to a potential lack of medical records it is common for the

behavioral symptoms of TBI to be misclassified as ASD or other conditions, and as such, trusting school-home relationships and alleviating parental fears are vital in accurate identification (Jantz et al., 2014). It is also possible that undiagnosed disorders existed before a TBI occurred. However, examiners should keep in mind that a TBI may exacerbate, reduce, or create learning, behavioral, or social challenges (Jantz et al., 2014).

Social impairments are frequently noticed in students with TBI; likely due to the injury affecting neurological regions involved in socialization such as EF, language, cognition, and motor skills (Feifer, 2010; Singh, Turner, Nguyen, Motwani, Swatek, & Lucke-Wold, 2016). Additionally, injuries in certain regions of the brain have been associated with symptoms that may mimic those seen in ASD. Knowledge of these neurological areas and associated symptoms will help school teams make educated decisions when differentiating ASD from TBI. Examiners should be cautious, however, that TBI is a highly heterogeneous condition and no two children will present with the same symptoms, even if they suffered seemingly the same injury. See Table 20 for more information about areas of brain lesion and associated symptomology.

Table 20  
*Areas of Brain Lesion or Injury and ASD-Associated Symptomology*

<u>Area of Brain Lesion</u>	<u>Symptoms</u>	
Anterior cingulate cortex	Difficulty coordinating cognition, emotion, and behavior, and shifting attention to and from appropriate stimuli, lack of empathy	Dickstein et al., 2013; Fan, 2012; Feifer, 2009; Hills, 2014; Prigge et al., 2013; Stigler & McDougal, 2012;
Basal ganglia including the orbitofrontal cortex and caudate nucleus	Repetitive behaviors, poor regulation of impulsive behaviors and mood, cognitive inflexibility, obsessions and compulsions	Carlson, 2012; Ecker, Bookheimer, & Murphy, 2015; Feifer & Rattan, 2009; Lezak, Howieson, Bigler, & Tranel, 2012;
Brain stem	Sensory impairment	Dickstein et al., 2013; Fan, 2012; Prigge et al., 2013; Stigler & McDougal, 2012;

Broca's Area, Wernike's Area, and connecting circuits	Challenges with expressive language and prosody, receptive language, social attention and language processing	Carlson, 2012; Fan, 2012; Sivapalan & Aitchison, 2014;
Cerebellum	Difficulties with modulating language, emotions, and executive functions, regulating sensory responses, shifting attention, predicting outcomes, memory	Bauman & Kemper, 2012; Fan, 2012; McPartland, Klin, & Volkmar, 2014; Lezak et al., 2012; Sivapalan & Aitchison, 2014;
Cerebellum, fusiform facial area, anterior cingulate cortex Corpus callosum	Trouble interpreting and using prosody, tone of voice, gestures, and facial expressions Slow processing speed	Carlson, 2012; Fan, 2012; Sivapalan & Aitchison, 2014;  Dickstein et al., 2013; Fan, 2012; Prigge et al., 2013; Stigler & McDougal, 2012; McPartland et al., 2014; Sivapalan & Aitchison, 2014;
Fusiform facial area and mirror neurons	Challenges with facial recognition and processing, predicting and imitating actions	Dickstein et al., 2013; Fan, 2012; Prigge et al., 2013; Stigler & McDougal, 2012; McPartland et al., 2014; Sivapalan & Aitchison, 2014;
Left posterior occipital lobes Limbic system	Echolalia, jargon, sensory dysfunction, difficulty with sequencing Increased fear and anxiety, difficulty with interpretation and recognition of emotions and coordinating a response to various stimuli, flattened affect, faulty memory consolidation, lack of empathy	Lezak et al., 2012;  Dickstein et al., 2013; Fan, 2012; Prigge et al., 2013; Radice-Neumann, Zupan, Babbage, & Willer, 2007; Stigler & McDougal, 2012;
Prefrontal cortex	Difficulties with shifting, dividing and maintaining attention, generalization of learning, and anticipating. Concrete thinking, poor abstraction and theory of mind, anger and irritability	Geraci, Surian, Ferraro, & Cantagallo, 2010; Jantz et al., 2014; Lezak et al., 2012; Muller et al., 2010
Right hemisphere	Psychotic ideation, emotional distress, aggression, somatic complaints, mania, misreading of facial expressions and emotional intent.	Feifer, 2010
Right insula	Poor empathy and affect	Dickstein et al., 2013; Fan, 2012; Prigge et al., 2013; Stigler & McDougal, 2012; Lezak et al., 2012
Right premotor anterior cortex Superior medial prefrontal lobes	Lack of gestures, prosody and intonation difficulties Poor perspective taking, self- knowledge self-reference, and self- monitoring	Lezak et al., 2012
Superior temporal sulcus	Difficulties interpreting facial expression	McPartland et al., 2014; Sivapalan & Aitchison, 2014;
Thalamus	Challenges with memory retrieval, emotion regulation, and visual-spatial processing.	Lezak et al., 2012

**Intellectual disability.** ID is defined by IDEA (2004) as “...significantly subaverage intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child’s educational performance” (IDEA regulations, 34 CFR, Section 300.8(c)(6)).

Approximately six to ten out of one thousand individuals has an ID, which can present with a wide range of severity and related symptomology (Shapiro & Batshaw, 2013). The level of severity is determined by examination of one’s challenges and support needs in conceptual, academic, social, and daily living skills (APA, 2013). In general, parents or pediatricians will notice delays in motor, language, and/or social skills by the age of two, but delays can be noticed earlier with severe cases and later with mild cases (APA, 2013; Shapiro & Batshaw, 2013).

Up to 35% of individuals with ASD have an ID, and 40% of individuals with severe ID meet diagnostic criteria for ASD (Cervantes & Matson, 2015). Additionally, children with ID may have concurrent behavioral, social, and communication challenges, restricted and repetitive behaviors, and some may demonstrate skill regression making distinguishing between ID alone, ASD alone, and ASD+ID a challenging task that may require several evaluations over time (Saulnier & Ventola, 2012; Shapiro & Batshaw, 2013). In fact, studies have shown that the SRS-2 and ADI-R are not always reliable methods of differentiating ASD from ID (Havdahl et al., 2016). Further complicating the issue, certain genetic conditions associated with ID (e.g., Fragile X, Turner syndrome) may share several symptoms with ASD, and school teams may be faced with determining whether those symptoms are part of the phenotypic expression of the genetic condition,



or comorbid ASD (Pennington, 2012; Hartley & Sikora, 2010). See Table 21 for examples of genetic condition that is particularly difficult to differentiate from ASD.

Finally, the lack of valid instruments for differentiation and the need in many cases for evaluators to rely on qualitative differences can make differentiating ID from ASD a very challenging task indeed (Hartley & Sikora, 2010; Matson & Shoemaker, 2009). Table 22 describes characteristics of ID as they relate to ASD.

Table 21

*Shared and Differentiating Characteristics of Fragile X Syndrome and ASD*

	<u>Shared Symptoms</u>	<u>Differentiating Symptoms</u>
Social Communication	Language delays, abnormal speaking patterns, stereotyped language, echolalia, strengths in reading decoding, difficulty with abstract language, social anxiety, avoidance of eye-contact, lack of pointing, range of facial expressions	Interest in social interactions, many social deficits on par with intellectual abilities, social smiles, offering to share, shared enjoyment, use of gestures, no pronoun reversal
Restricted and Repetitive Behaviors	Hand flapping, adherence to routine, sensory differences, circumscribed interests, verbal rituals, repetitive object use	No unusual preoccupations, rituals and compulsions, or complex hand and finger mannerisms

*Note.* Information gathered from the following sources: Kroncke et al., 2016; McDuffie, Thurman, Hagerman, and Abbeduto, 2015; Pennington, 2012; and Thurman, McDuffie, Kover, Hagerman, and Abbeduto, 2015.

When communicating with others, children with ID tend to demonstrate pragmatic and grammatical errors congruent with their developmental levels, but unlike ASD, they may overcompensate for difficulty communicating by increasing their use of gestures, facial expressions, and eye contact (Saulnier & Ventola, 2012). Similarly to those with ASD, conversations of children with ID may be marked by tangential or irrelevant responses, but these are generally due to inability to process quick back and forth banter and figurative language (Saulnier & Ventola, 2012). Limited attention and difficulty interpreting subtle social cues may also play a role in communication

difficulties (Saulnier & Ventola, 2012; Pennington, 2012). Echolalia can appear in children with ID alone, but qualitative differences such as imitation of words without imitation of tone and rate differentiate it from that seen in ASD (Grossi, Marcone, Cinquegrana, & Gallucci, 2013). Qualitative differences also differentiate imitation difficulties that are seen in both conditions. Whereas children with ASD may have difficulty imitating, even when directly prompted, children with ID tend to only demonstrate difficulties in naturalistic settings such as play and conversation (Hartley & Sikora, 2010; Messier et al., 2008). Other social-communicative characteristics that are not typically seen in ID are stereotyped language, lack of integrated facial expressions, and use of another's body as a tool (Hartley & Sikora, 2010). Finally, independent play of children with ID may be delayed and as such, confused with impairments seen in ASD. In contrast to those with ASD, children with ID tend to be more spontaneous, curious, and exploratory during play and are often observed attempting to draw in caregivers (Kroncke et al., 2016; Messier et al., 2008). In schools, difficulties with communication and social interaction may appear more pronounced when children with ID are interacting with grade-level neurotypical peers; evaluators should be careful when differentiating difficulties that are attributed to developmental errors versus those that are attributed to a potential ASD.

Restricted and repetitive interests may also need to be differentiated.

Circumscribed interests are not readily observable in children with mild to moderate ID, however children with ID may be more likely than neurotypical peers to engage in repetitive movements (APA, 2013; Cervantes & Matson, 2015; Hartley & Sikora, 2010).

Table 22

*ASD-Like Characteristics of ID*

Social Communication	May be described as having immature social skills, rejected by typically developing peers, be considered odd or unusual, or have awkward social interactions; may demonstrate pragmatic or grammatical errors, echolalia, make tangential remarks, and have imitation difficulties; tendency to engage in concrete play,	APA, 2013; Hartley & Sikora, 2010; Messier, Ferland, & Majnemer, 2008; Pedersen et al., 2017; Pennington, 2008; Saulnier & Ventola, 2012
RRBs	May engage in repetitive play or conversation and demonstrate behaviors such as hand flapping or self-injury. Children with moderate to severe/profound ID and those with certain genetic conditions may display RRBs that are indistinguishable from those seen in ASD including fascination with parts of objects, sensory dysfunction, adherence to routines, and ritualistic behaviors; Comorbidities may increase likelihood of RRB	APA, 2013; Cervantes & Matson, 2015; Hartley & Sikora, 2010; Saulnier & Ventola, 2012
Associated Symptoms	Comorbidities may include ADHD, anxiety disorders, and stereotypic movement disorders; difficulties with sustained attention, abstract thinking, and generalization; may demonstrate poor theory of mind; difficulties with executive functions such as planning, organization, cognitive flexibility, and short-term memory; language and motor skill delays; poor emotional regulation, intense tantrums and outbursts, self-injury, elopement, and aggression are common	APA, 2013; Cervantes & Matson, 2015; Emerson, Einfeld, & Stancliffe, 2010; Pennington, 2012; Saulnier & Ventola, 2012; Shapiro & Batshaw, 2013

There are several key associated symptoms that may serve to confuse and differentiate ID and ASD diagnoses. Cognitive commonalities include difficulties with sustained attention, abstract thinking, and generalization. Theory of mind and central coherence may be limited in children with ID on age-appropriate measures, but no evidence was found that these skills are delayed when given developmentally-appropriate measures. One key difference is that adaptive and cognitive abilities are generally on par with one another in ID, whereas in ASD one can expect a wide split between the two (Saulnier & Ventola, 2012). One other important distinction between cognition in ASD and ID is that skill development of children with ID follows a typical developmental trajectory and it is unusual to observe the advanced or precocious development in specific areas, strong rote memory, or a significant split between verbal and nonverbal abilities, as frequently seen in ASD (Pennington, 2012; Saulnier, 2012). However, it should be noted that in certain genetic syndromes associated with ID such as Fragile X, Williams syndrome, Turner syndrome, and Down syndrome, wide skill scatter can be expected (Pennington, 2012; Saulnier & Ventola, 2012; Shapiro & Batshaw, 2013). Language and motor may appear similar, but in ASD these skills can be splintered and more *or* less developed compared to the individual's cognitive abilities; in ID these skills tend to be on par with developmental levels (Pennington, 2012; Saulnier & Ventola, 2012). Finally, comorbid ID and behavioral challenges may further resemble ASD and this comorbidity should be considered during evaluations. Overall, though certain behaviors seen in ID may resemble those of ASD, no evidence was found that children with ID have difficulties interpreting emotions beyond developmental level.

Finally, the early social histories of ID and ASD may be difficult to differentiate. Though parents of infants with ASD may report social delays in early infancy, these are not as readily reported in children with mild to moderate ID, whose parents first notice delays in language and motor skills (APA, 2013; Saulnier & Ventola, 2012; Shapiro & Batshaw, 2013). Children with severe and profound ID may present with a general lack of visual and social response in early infancy, which may be mistaken for traits of ASD (Saulnier & Ventola, 2012; Shapiro & Batshaw, 2013). But generally speaking, children with ID demonstrate a wide range of developmentally appropriate social, communication, and play skills depending on the level of ID severity (APA, 2013).

**Multiple disabilities.** Multiple disabilities is an IDEA (2004) disability category that special education teams may use when a student meets full eligibility criteria for more than one condition. Generally, school teams identify one primary disability and secondary disabilities as needed. However, if a student has significant support needs in more than one area, all of which impact his ability to access equitable education and require specialized services, the category “multiple” may be used. IDEA (2004) defines Multiple disabilities as “concomitant impairments...the combination of which causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments” (IDEA Regulations, 34 CFR, Section 300.8(c)(7)).

In many states, this category is reserved for students requiring the most significant of educational services and supports. The multiple disabilities category is important to include in the discussion of differentiation from ASD due to its shared symptomology

with multiple conditions. School-based evaluation teams may be faced with the decision of whether multiple comorbid conditions with combined symptoms that mimic ASD or ASD is at the root of a student's educational needs. For instance, a student with ID, SLI, and ED may meet many if not all of the educational criteria for ASD and if misdiagnosed, may miss out on specialized supports more suited to his or her needs

**Intellectual giftedness.** There is no federal definition of intellectual giftedness (IG) and states have widely varying criteria and policies when it comes to defining giftedness as well as identification and service provision (*State Definitions of Giftedness*, 2016; *State of the States in Gifted Education*, 2015). The National Association for Gifted Children recognizes gifted individuals as those who demonstrate “outstanding levels of aptitude” or “competence in one or more domains” (“Definitions of giftedness,” 2017). In sum, individuals who have IG must have documented exceptionalities in the top 10% or rarer.

Though on the surface IG seems to share few commonalities with ASD, numerous associated characteristics of IG make it a condition that should be considered when evaluating and identifying ASD in the school setting. Table 23 provides a summary of the social-communicative, restricted and repetitive, and associated characteristics of IG as they relate to those of ASD. As evidenced in Table 23, children with IG may have several social and behavioral characteristics in common with children with ASD. However, rather than being innate challenges as seen in ASD, the social difficulties of IG seem to originate when initial attempts to interact with peers are met with rejection and the child, overly sensitive to this rejection, does not persist (Andronaco et al., 2014; Stankovska et

al., 2013). School-aged children may have difficulty finding peers with whom to identify, which may further limit opportunities for social learning to occur (Assouline et al., 2009; Kral, 2009). One might expect, given this information that the early social milestones would be typical in children with IG. One social hallmark of IG that is not commonly observed in ASD is an asynchronous pattern of social and communicative ability (Andronaco et al., 2014; Honeck, 2012). For instance, a child with IG may communicate very appropriately with an adult about an area of interest, but struggle with common back and forth banter with a same-aged peer or engage in a heated debate with an adult about a controversial political issue, but hit a child who wants to share a toy. Further, though social challenges may be apparent in students who have IG during every-day encounters, they may be non-existent during times that the student is engaging with others about areas of strong interest or demonstrating his or her areas of strength (Assouline et al., 2009; Kral, 2009; Walker & Shore, 2011). This pattern of asynchronous social development is not apparent in children with ASD. Though children with ASD may feel more comfortable around adults than children, communicative nuances such as lack of eye contact and difficulty with gesture use will be pervasive rather than situational.

In addition to careful differentiation of the social characteristics of ASD and IG, an examiner should also take careful note of symptoms that do not exist in IG alone. Compared to children with ASD, children who have IG do not struggle with incorporating gestures, interpreting or using facial expressions, using eye contact, engaging in joint attention, or demonstrate stereotyped language, echolalia, or pronoun reversal (Assouline et al., 2009; Mendaglio & Tillier, 2006). Rather than inflexible and

Table 23

*ASD-Like Characteristics of Intellectual Giftedness*

Social Communication	In early childhood: difficulties with social communication, empathy, sharing and turn-taking, and use of gestures. In childhood: Fewer friendships; more likely to be bullied and rejected by peers; tendency to engage in more solitary play and work than their neurotypical peers; withdrawal from peers; increased interpersonal conflict; tendency to interact better with adults than with children; tendency to speak in an overly formal manner, very rapidly, and at great length about areas of interest, often to the exclusion of others	Andronaco, Shute, & McLachlan, 2014; Assouline, Nicpon, & Doobay, 2009; Doobay, Foley-Nicpon, Ali, & Assouline, 2014; French, Walker, & Shore, 2011; Guénolé et al., 2013; Kral, 2009; Stankovska, Pandilovska, Taneska, & Sadiku, 2013; Rinn & Reynolds, 2012; Walker & Shore, 2011;
RRBs	Tendency to spend considerable time and energy focusing on specialized areas of interest; sometimes to the point of apparent perseveration; Sensory differences are also common in children with IG, who may demonstrate food and smell aversions, light and sound sensitivity, or be resistant to touch; common psychomotor agitation such as pacing and hand-wringing; nervous tics and excess activity level; maladaptive levels of perfectionism, sometimes to the point of demonstrating obsessions and compulsions, which may be mistaken for ritualistic behaviors	Assouline et al., 2009; Doobay et al., 2014; Gere, Capps, Mitchell, Grubbs, & Dunn, 2009; Guénolé et al., 2013; Honeck, 2012; Kral, 2009; Mendalgo & Tiller, 2006; Mrazik & Dombrowski, 2010; Rinn & Reynolds, 2012
Associated Symptoms	In early childhood: aggression during social conflicts. In childhood: Highly uneven cognitive profiles; precocious academic development including hyperlexia and hypercalculia; increased risk for behavioral challenges, depression and anxiety; heightened levels of frustration and perfectionism; poor emotional regulation; increased impulsivity and somatic complaints; difficulties coping with setbacks; tendency to “zone out” when understimulated or bored; excess energy; global EF challenges that decrease when engaged in areas of strength or interest	Assouline et al., 2009; Burger-Veltmeijer, 2011; Dombrowski, 2010; Doobay et al., 2014; Gere et al., 2009; Guénolé et al., 2013; Mrazik & Dombrowski, 2012; Rinn & Reynolds, 2012; Walker & Shore, 2011; Honeck, 2012; Walker & Shore, 2011; Whitaker, O'Callaghan, & Houskamp, 2013;



rote in nature, the play and thinking of children who have IG can be highly imaginative and creative in nature and may incorporate the perspectives of others at an advanced level of understanding (Assouline et al., 2009; Walker & Shore, 2011). Finally, children with IG tend to have well-developed understandings of the social nuances of others, enhanced empathy, and an ability to share ideas with, inquire about, and engage in reciprocal conversation with others (Assouline et al., 2009; Walker & Shore, 2011).

Examiners may also need to differentiate RRBs from common behavioral characteristics of IG. Children who have IG do not demonstrate RRBs (e.g., repetitive mannerisms, unusual use of objects or toys, adherence to routines, complex hand and finger mannerisms) seen in ASD (Assouline et al., 2009). However, some characteristics of IG may be mistaken for RRBs, and evaluators should be careful to differentiate between the two. Children who have IG may spend considerable time and energy focusing on specialized areas of interest, sometimes to the point of apparent perseveration (Doobay et al., 2014; Guénolé et al., 2013; Mrazik & Dombrowski, 2010). However, this heightened attention to areas of interest and strength is unlikely to cause distress if interrupted. Psychomotor agitation such as pacing and hand-wringing or other nervous tics and excess activity levels are common, though in children with IG this tends to be more focused than what is seen in ASD (Mendaglio & Tillier, 2006; Rinn & Reynolds, 2012). Finally, though fear of the unknown is common (possibly due to strong imagination and a tendency toward anxiety), children with IG tend to thrive on novelty during school-based or other cognitive tasks (Harrison & Van Hanechan, 2011; Walker & Shore, 2011), unlike children with ASD who thrive on routine and sameness.

Several characteristics of IG may also require differentiation from the academic, cognitive and behavioral characteristics of ASD. Strengths in mathematical and weaknesses in verbal reasoning are common, but in IG the reverse may also be true (Doobay et al., 2014; Guérolé et al., 2013; Mrazik & Dombrowski, 2010). Exceptional memory abilities are frequently seen, but compared to those with ASD, there is not necessarily a difference between semantic and episodic memory (Doobay et al., 2014; Guérolé et al., 2013). Other cognitive, academic, and EF traits of children with IG that differentiate them from children with ASD include strengths in generalization, flexible application of knowledge, creative problem-solving, abstract thinking, typical to advanced processing speed, and evenly developed cognitive and adaptive abilities (Burger-Veltmeijer, 2011; Doobay et al., 2014; Walker & Shore, 2011).

**Comorbidities.** Differential diagnoses should not be confused with comorbidities. Comorbidities are distinct conditions that co-occur alongside another disability (Matson & Williams, 2013). The DSM-V lists ADHD, developmental coordination disorder, anxiety and other mood disorders, learning disability, and various medical conditions as potential comorbidities for ASD, which can muddy the waters of diagnostic clarity. Further complicating diagnostic accuracy, most disabilities can be comorbid with diagnoses that share symptomology with ASD such as speech and language impairment, or present with a range of behavioral challenges due to environmental difficulties. For instance, a child who has ADHD and severe speech and language impairment may meet more diagnostic criteria for ASD than a child who has ADHD alone. Carefully delineating and considering comorbidities is vital in diagnostic accuracy.

**Summary.** Overall, it is clear that the terminology that describes both the diagnostic criteria and extended phenotypic indicators of ASD overlap with those of several childhood conditions. There are also several instances where the characteristics of one disorder or condition may mimic something commonly observed in children with ASD. Though some symptom terminology may be shared or confused, there are qualitative differences in symptom presentation, origin, or intensity that during an evaluation may trigger the clinical judgment of an experienced examiner. The process of differentiating between ASD and other conditions cannot occur without a well-executed and thorough evaluation.

### **Best Practices in School-Based ASD Evaluation**

IDEA (2004) mandates that school-based evaluations for suspected disabilities use a variety of assessment tools, incorporate parent input, include evidence regarding progress in general education, and be fair and nondiscriminatory. Assessments should cover all aspects of a student's suspected disability and any assessment given should be relevant to the student's needs and directly influence educational decisions (IDEA, 2004). In contrast clinical evaluations, a major focus of school-based evaluations is to determine the extent of educational impact (Kroncke et al., 2016). In schools, evaluations are a team effort and may involve assessment from a school psychologist, special education teacher, speech and language pathologist, occupational therapist, physical therapist, and/or school nurse. Depending on the specific student needs, thorough school-based evaluations for ASD may include: Review of records, parent interview(s), teacher interview(s), student observations, functional behavior assessment (FBA), and assessments of cognition, EF,

adaptive skills, language ability, play skills, motor functioning, sensory impairment, and ASD-specific functioning (APA, 2013; Clark et al., 2014; CDE-ESSU, 2015; Lai et al., 2014; Saulnier & Ventola, 2012).

**Review of records.** A review of records is a vital component of a thorough ASD evaluation and can supplement parent report pertaining to a child's adaptive, educational, social, and behavioral history (CDE-ESSU, 2015; Saulnier & Ventola, 2012). Records that one might review include clinical or medical evaluation reports, clinical or educational services records, genetic testing, report cards, discipline records, and past IEPs, (Saulnier & Ventola, 2012). Schools that use Response to Intervention (RtI) or Multi-Tiered Systems of support (MTSS) in the identification of ASD may also have valuable records involving a child's response to intervention over time. Caution should be used when reviewing RtI or MTSS data, however, as interventions specific to ASD may have been implemented by general education teachers or teams who lack expertise in identifying and providing services to children with ASD. In cases where ASD-specific interventions were provided to a student, a lack of response to those interventions could indicate that the child did not in fact have ASD, or it could indicate that the student's level of ASD-related needs required more specialized and intensive services, or that the interventions were poorly designed, or that they were not implemented with fidelity. A review of scores, clinical impressions or diagnoses, and narrative writing included in any of the records discussed above may yield important clues to the presence or absence of ASD. Table 24 summarizes records and questions one might ask during their review.

Table 24

*Questions to Ask During a Review of Records*

Clinical evaluation reports	Was there a suspicion or diagnosis of ASD? Was the child evaluated for early language delay? Were symptoms such as lack of eye contact or lack of response to name reported? Was early social reported as development typical or atypical? Were behavioral challenges reported?
Medical evaluation reports	Was there a history of ear infections or gastrointestinal difficulties? Was there past physical or emotional trauma? Head injury? Suspicions of genetic conditions? Were there persistent ear infections or suspected hearing loss?
Clinical service records	Did the child received treatment for social, language, motor, or other difficulties? Did the service notes or reports contain any key indicators of ASD?
Educational service records	Did the child received treatment for social, language, motor, or other difficulties? Did the service notes or reports contain any key indicators of ASD?
Report cards	Was there a persistent difference between rote vs. abstract skills? Between decoding and comprehension? Between math facts and word problems? What were the teacher's notes focused on? Behavior? Academics? Social skills?
Discipline records	Are there indicators of persistent social difficulties? Escape-related challenges? Signs of poor emotional-regulation? Anxiety?
Past IEPs	How was the child described in the narrative reports? Was there a history of social challenges? Language challenges? What were the goals focused on? Social skills? Play? Language? Academics?
MTSS or RTI data	What were the teacher's main concerns? What interventions were tried? Is there evidence that they were implemented with fidelity?

**Parent interview.** Among all the factors that may differentiate ASD from other conditions, one's early developmental history appears to be of utmost importance. Several of the differential conditions reviewed above present with social challenges that develop secondary to core symptoms, indicating there is a period of relatively typical social development. Parent interviews should seek information regarding present and historical child strengths and concerns, family dynamics and history, pre, peri, and post-natal experience of mother, developmental milestones, information about early and

current communication, behavior, mood, and social skills, medical and educational history, and specific warning signs for ASD and other conditions the team is considering (Brock, Jimerson, & Hansen, 2006; CDE-ESSU, 2015; Mazza, 2014; Saulnier & Ventola, 2012). For specific examples of parent interview questions, please refer to Brock, Jimerson, & Hansen, 2006; CDE-ESSU, 2015; and Kroncke et al., 2016).

**Teacher interviews.** In school-based evaluations, teacher interviews are a critical component to determining the educational impact of a child’s symptoms. Further, teachers are with children for a large portion of their days and may have special insight into a child’s peer interactions, cognition, behavior, and academic strengths and weaknesses, as well as how a child compares to his or her neurotypical peers. Teacher interviews should include questions regarding academic, cognitive, social, and behavioral strengths and weaknesses, interventions that do and do not work to support the student, and ASD-specific questions (Brock, Jimerson, & Hansen, 2006; Saulnier & Ventola, 2012). Table 25 lists ASD-specific question topics that might guide a teacher interview.

Table 25  
*ASD-Specific Teacher Interview Topics*

Social-Communicative Concerns	Creativity and imagination
	Friendships and relationships with peers
	Conversation ability
	Times when child does/does not stand out from peers
	Response to independent, partner, or small group work
RRB Concerns	Student interests
	Things student avoids
	Ability to engage with a variety of topics
	Sensory sensitivity or seeking behaviors
	Responses to changes in routine
	Repetitive movements

Associated Concerns	Understanding of math and time Reading decoding vs. comprehension Ability to make inferences Behavioral concerns, triggers, and responses Response to 1:1, small group, large group instruction Ability to follow directions Academic, cognitive, behavioral strengths and weaknesses
Brock, Jimerson, & Hansen, 2006; CDE-ESSU, 2015; Kroncke et al., 2016; Saulnier & Ventola, 2012	

**Classroom observations.** Classroom observations provide the school evaluator with a unique opportunity to not only observe the child interacting with peers, adults, and learning materials in a natural environment, but to compare the child to his or her peers as well. Multiple classroom observations should occur during the course of an evaluation (CDE-ESSU, 2015; Saulnier & Ventola, 2012). It is important that several SISPs observe the student in multiple settings and during multiple times of day (Kroncke et al., 2016). Obtaining a mixture of observations during structured (e.g. independent and group academic work, group instruction, art or music class) and unstructured (e.g. before and after school, class parties, recess, lunch) times can also be valuable. Finally, environmental characteristics such as classroom management, structure, rules, clarity of instruction, and curriculum should be examined (Saulnier & Ventola, 2012). Classroom observations for students with suspected ASD look for critical behaviors as compared to neurotypical classroom peers under the following categories: communication, social interaction, adaptive functioning, play, restricted and repetitive behavior, and behavioral and emotional functioning (CDE-ESSU, 2015; Pasco, Gordon, Howlin, & Charman, 2008; Saulnier & Ventola, 2012; Westman Andersson, Miniscalco, Johansson, & Gillberg, 2013). For each of these categories, an observer may note the characteristics of the child's behaviors compared to those of a neurotypical classmate. For examples of

ASD-specific observation forms, please refer to CDE-ESSU, 2015 and the supplemental materials contained in Westman Andersson et al., 2013.

**Functional behavior assessment.** If a student’s behaviors are disruptive and/or interfering with his or her own or classmates’ learning, a Functional Behavior Assessment (FBA) should be conducted (Steege & Schieb, 2014). An FBA is a collaborative effort between the student, staff, and parents that works to examine the dynamic and multifaceted relationship between a student and his or her environment (Matson, Beighley, & Turygin, 2012; Steege & Schieb, 2014). The purpose of an FBA is to identify specific behaviors that need to be changed, determine why they are occurring, and create a plan to change them (Matson et al., 2012; Saulnier & Ventola, 2012; Steege & Schieb, 2014). Table 26 lists the specific components of an FBA.

Table 26  
*Components of a Functional Behavior Assessment*

Targets of Assessment	Antecedents
	Contextual contributions to behavior
	Individual contributions to behavior
	Individual behavior deficits
	Motivating Operands
	Discriminative Stimuli
	Consequences
Assessment Procedures	Interviews
	Observations
	Record reviews
	Recording of frequency, intensity, duration, latency
	Recording of antecedents, behaviors, and consequences
	Functional analysis of antecedents and consequences
Phases of an FBA	Identify specific target behavior
	Conduct assessments
	Identify Antecedent and Consequence
	Develop and test hypothesis
	Link assessment data to intervention
	Record response to intervention

Steege & Schieb, 2014



**Formal assessments.** ASD evaluations should include formal assessments to address related concerns. These assessments may include those that address language and communication, cognition, adaptive abilities, emotions and behavior, play, EF and attention, academic skills, motor ability, and sensory processing (Brock, Jimerson, & Hansen, 2006; CDE-ESSU, 2015; Saulnier & Ventola, 2012). Evaluations should also include assessments specific to ASD.

The ADOS-2 and ADI-R are two autism-specific tools that are considered the “Gold Standard” assessments for autism diagnosis by clinicians and researchers alike (Rutter, Le Couteur, & Lord, 2003). Though these two assessments are observed to have excellent sensitivity and specificity when employed in research settings when combined with clinical judgment, these strengths do not always translate to clinical or school-based settings (Grzadzinski et al., 2016; Kamp-Becker et al., 2018). Studies indicate that parental objectives and faulty memory can lead to inflated scores on the ADI-R and that the increase in attention toward and service provision to children with ASD, parents may be likely to over-report ASD like symptoms in their children (Grzadzinski et al., 2016). When employed in clinical settings, ADOS-2 scores can have high variability amongst clinicians and lose sensitivity when a child’s true root cause is ADHD, ID, or behavioral disturbance (Grzadzinski et al., 2016; Havdahl et al., 2016; Kamp-Becker et al., 2018), particularly when behavioral problems, intellectual disability, or ADHD are present. Further, there is a dearth of research into the potential diagnostic bias and error that may occur when the ADOS-2 is used in school settings; particularly when school-based examiners have an ongoing relationship to the child and/or family. Table 27 summarizes

the strengths and weaknesses of the ADOS-2, ADI-R, and several additional ASD-specific assessments.

Overall, school-based evaluations for the presence of ASD are not a linear process beginning with referral and ending at scoring of assessments. During several junctions, assessment data must be integrated and interpreted, and important decisions must be made. These decisions may include whether to assess for the presence of a differential condition, what disability, if any, is ultimately the root of a student's difficulties, and whether the student's disability has such an impact on his or her education that he or she cannot make progress without specialized supports. For school teams to make sound identifications, potential decision-making errors and biases should be addressed.

### **Issues in Diagnostic Decision Making**

Diagnostic decision-making is a process during which, after taking in a variety of information, a clinician generates and evaluates hypotheses about a client's condition (Thomas, Dougherty, Sprenger, & Harbison, 2008). Diagnostic decision-making, like decision-making in general, is theorized to be a dual process, in which an individual uses fast and automatic (Type 1) and/or slow and conscious (Type 2) forms of reasoning (Lucchiari & Pravettoni, 2012; Stanovich, 2010; Thammasitboon & Cutrer, 2013). Type 1 reasoning, also known as heuristic reasoning, relies on intuition, recognized patterns, and snap judgments often based on stereotypes and generalizations (Stanovich, 2010; Thammasitboon & Cutrer, 2013; Wilcox & Schroeder, 2015). This type of reasoning is designed to get one "into the right ballpark" (Stanovich, 2010; p. 129) when engaged in complex decision-making. Type 1 reasoning is rife with errors and bias when used by

Table 27

*ASD-Specific Instruments Strengths and Weaknesses*

<u>Instrument</u>	<u>Purpose</u>	<u>Strengths</u>	<u>Weaknesses</u>	
Autism Diagnostic Interview - Revised (ADI-R)	A semi-structured, 100+ question parent/ caregiver interview. Based on the DSM-IV criteria. Developed to be a companion to the ADOS.	Considered a “gold standard” assessment; particularly when used in conjunction with the ADOS-2 and clinical judgment.	Requires extensive training. Very time-consuming: can take over 3 hours to administer. Results may be subject to parental perceptions, memory, and objectives.	Brock, Jimerson, & Hansen, 2006; Grzadzinski et al., 2016; Rutter et al., 2003; Saulnier & Ventola, 2012; Wiggins et al., 2015;
Autism Diagnostic Observation Schedule, 2 <sup>nd</sup> Edition (ADOS-2)	A standardized assessment of autism characteristics in individuals 18 months through adulthood. Semi-structured format based on play and observations.	Considered a “gold standard” assessment for ASD. Strong reliability and validity when administered by well-trained experts; particularly in research settings.	Requires extensive and ongoing training. Examines behaviors over a small sample of time. Ratings are subjective and should not replace clinical judgment. High variability in scoring amongst practitioners; No evidence that it is not subject to decision-making errors when administered by school teams.	Kamp-Becker et al., 2018; Lord et al., 2012; Saulnier & Ventola, 2012;
Checklist for Autism Spectrum Disorder (CASD)	A parent checklist or semi-structured clinical interview used to screen children for ASD.	Administration versatility, 99% accurate in predicting ASD and strong specificity when administered by ASD experts. Manual includes intervention suggestions.	Fails to include questions regarding gesture use. High level of technical jargon if used as a parent checklist. Loss of sensitivity and specificity if used as a checklist.	Atlas & Powell, 2012; Mayes, 2012
Childhood Autism Rating Scale (CARS)	Structured observational checklist to be completed by someone familiar with both ASD and typical development.	Widely used, brief, adequate sensitivity and specificity when completed by someone with clinical expertise and in conjunction with other measures.	Out of date diagnostic criteria, may incorrectly classify children with ID as having ASD. Specialized expertise needed to administer.	Brock, Jimerson, & Hansen, 2006; Falkmer, T., Anderson, Falkmer, M., & Horlin, 2013;

Gilliam Autism Rating Scale, 3 <sup>rd</sup> Edition (GARS-3)	An ASD rating tool aligned with the <i>DSM-V</i> .	Adaptive administration for children who are nonverbal, supplemental intervention materials.	High level of technical jargon may be confusing for non-professional raters. Ratings may be given after as little as 6 hours of knowing or observing a child.	Atlas & Hutchins, 2012; Gilliam, 2014
Modified Checklist for Autism in Toddlers (M-CHAT)	A brief parent/caregiver screening tool to identify ASD symptoms in children under the age of three.	Brief, easy to administer, can alert clinicians to “red flags” indicative of ASD.	Inadequate sensitivity and specificity. Relies on parent report, which may be impacted by memory or objective.	Brock, Jimerson, & Hansen, 2006; CDE-ESSU, 2015; Falkmer et al., 2013; Saulnier & Ventola, 2012
Social Communication Questionnaire (SCQ)	A parent/caregiver rating scale derived from the ADI-R.	Availability in Spanish and English. Alternate completion and scoring procedures for children who are nonverbal.	False positive results for children of diverse backgrounds and children with behavioral and emotional challenges, low socioeconomic status, and/or low maternal education. Males and those with ID tend to have elevated scores. Spanish form criticized for lack of cultural sensitivity.	Moody et al., 2017;
Social Responsiveness Scale, 2 <sup>nd</sup> Edition (SRS-2)	A caregiver and/or teacher rating scale based on the diagnostic criteria of the <i>DSM-V</i> . Can be used for screening, intervention planning, or progress monitoring.	Ability to be completed by parent and teacher, separate norms for males and females; separate scores for several ASD-related domains; preschool, school-aged, and adult forms; adequate sensitivity for screening purposes.	False positive results for children of diverse backgrounds and children with developmental delay, behavioral and emotional challenges, ADHD, low socioeconomic status, and/or low maternal education. Awkward to complete for children who are nonverbal. May be influenced by parent perceptions or objectives.	Aldridge, 2012; Cholemky, Kitzerow et al., 2014; Cholemky, Mojica et al., 2014; Constantino & Grueber, 2012; Havdahl et al., 2016; Hoff & Yetter, 2014; Hus et al., 2013; Moody et al., 2017; Pine et al., 2008; Rosenburg et al., 2009

novices, but can be much more accurate when used by expert diagnosticians (Betan & Binder, 2012; Lucchiari & Pravettoni, 2012; Stanovich, 2010; Thammasitboon & Cutrer, 2013). Type 2 reasoning is relied on by novice diagnosticians, and used by experts in combination with Type 1 reasoning (Betan & Binder, 2012; Lucchiari & Pravettoni, 2012). This type of reasoning is employed when symptom patterns are not recognized and is based on research, analytic reasoning, and conscious reflection (Stanovich, 2010; Thammasitboon & Cutrer, 2013). Type 2 reasoning can be less flexible and more time consuming than Type 1, and is prone to systemic errors as well as biases when influenced by faulty Type 1 reasoning (Betan & Binder, 2010; Stanovich, 2010; Thammasitboon & Cutrer, 2013); well-executed type 2 reasoning, however, can override Type 1 errors and biases (Stanovich, 2010).

Integrating Type 1 and 2 forms of reasoning to make sound diagnostic decisions is not something that comes easily or quickly to clinicians. It is indeed the seamless integration of the two forms of reasoning coupled with years of experience that some claim is what separates experts from novices (Betan & Binder, 2010; Graber, 2009; Luchins, 2012; Thammasitboon & Cutrer, 2013). The journey from novice to expert, however, can't begin until errors of judgment are addressed and overcome.

**Decision-making errors.** Clinicians, including school and clinical psychologists, are prone to intra and inter-individual diagnostic inconsistencies (Watkins, 2009). Sources of error may include cognitive or heuristic biases, skill based errors, systemic errors, and assessment-based errors (Hanchon & Allen, 2018; Thammasitboon & Cutrer, 2013; Thammasitboon, Thammasitboon, & Singhal, 2013; Watkins, 2009). Cognitive

errors and heuristic biases are those thought-based errors that may occur automatically and without conscious deliberation. Heuristic biases and cognitive errors are especially problematic and may contribute to 75% of misdiagnoses (Thammasitboon & Cutrer, 2013). Skill based errors include the limits of human processing, memory, or even simple mistakes. Systemic errors may occur when the environment in which the assessment is occurring is not conducive to accurate results. Finally, assessment-based errors are those in which assessments are incorrectly used or inappropriate for a particular case. Table 28 summarizes each source of potential diagnostic error as well as examples of their application to school-based evaluation of ASD.

As evidenced by Table 28, there are numerous sources of error that can interfere with diagnostic decision-making. In contrast to those who practice in clinical settings, school teams may be especially prone to errors based on referral procedures, team dynamics, and ongoing emotional involvement with students.

In a school setting, an evaluation referral may be initiated by a parent or teacher, or through a RtI or MTSS student study team. These referrals may be general in nature, or specific to a suspected disability. While general referrals (e.g. student is having behavioral challenges and not progressing academically) may lead to multiple hypothesis generation, specific referrals (e.g. I think my son has ADHD) may direct the course of the evaluation proceedings. In fact, most students who qualify for special education do so under the category tied to their reason for referral (Foster, Ysseldyke, Casey, & Thurlow, 1989; Sattler & Sattler, 2014). In certain states and districts, RtI may pose an additional threat to multiple hypothesis generation upon receiving a referral for ASD. Eighteen

Table 28

*Errors and Error Examples Applied to School-Based Evaluations*

## Heuristic Biases

Error	Definition	Example
Affect Heuristic	Letting one's emotions about a case drive decision-making	A school team has been dealing with a student's difficult behavior for months. Due to the likelihood that an ASD label will initiate a transfer to a center-based program, the team ignores data that contradict an ASD identification.
Anchoring	Adhering to one's initial diagnostic impression despite contrary evidence.	After observing a student, a school psychologist suspects ASD. Despite typical early social development reported by parents, the psychologist continues to solely suspect ASD.
Attribution Error	Falsely attributing the source of a student's challenges to internal or external causes.	A school team receives numerous referrals from a teacher that never lead to eligibility. They start to attribute her student's challenges to a disorganized classroom environment and because of this, fail to identify a case where the student had a true disability.
Availability	Deciding based on the ease of which you can draw a particular diagnosis to mind.	A school psychologist recently attended a conference on ASD and her next five evaluations have resulted in ASD eligibilities.
Confirmation Bias	Only seeking information that confirms one's initial diagnostic impression.	Upon receiving a referral for a student with suspected ASD, a school psychologist uses only ASD-specific assessment tools.
Framing Effect	How and by whom information is presented can result in different outcomes	A school team asks the question, "What is the root cause of this student's challenges?" while an IEE team asks, "Does this student have ASD?" Both teams come up with different conclusions.
Illusory Correlation	Assigning pathology to characteristics of the neurotypical population	A new student with a speech delay is shy and does not have many friends at school. As a result, she spends her recess pacing back and forth along the playground perimeter. Her typical behaviors are incorrectly attributed to ASD.
Inconsistency	Applying decision-making rules inconsistently	Even though test data suggest typical functioning and they would normally never do so, a team qualifies a student for special education services after a parent threatens to sue.

Loss Aversion Bias	Engaging in risky behavior to avoid a loss	A school team has been warned about over-identifying SLD in their students. Not wanting to undergo an audit process, they fail to consider data that point toward SLD
Motivated Skepticism	Overexplaining data that are inconsistent with the hypothesis	SRSs completed by two teachers are within the typical range. The school team explains these results by claiming that the teachers are too busy to notice the student's unusual mannerisms.
Omission	Reluctance to diagnose with the true condition due to not wanting to be responsible for outcomes	All of a student's evaluation data point toward ID. However, the school psychologist, not wanting to have a difficult conversation with the parent, convinces the rest of the team that ASD is actually the root cause of the student's difficulties.
Overconfidence Bias	Being overconfident in one's diagnostic capabilities.	After observing several ADOS assessments, a school psychologist promotes herself as an expert in ASD evaluation.
Premature Closure	Jumping to conclusions, rather than thoroughly investigating a range of possibilities.	After observing a student engaging in repetitive movements during a classroom observation, a school psychologist refuses to test conditions other than ASD.
Representativeness	Making clinical judgments based on diagnostic stereotypes, rather than considering nuanced student information.	A young student presents with awkward social mannerisms and an intense interest in the solar system. The team only considers ASD, even though the sum of symptoms suggests IG.
Self-Served Bias	Only considering a student's problems from one's own perspective	A school team fails to consider information from a student's parents and home-based speech pathologist in making their eligibility consideration.
Stereotyping	Making a judgment based on a small number of stereotyped characteristics	A young child's mom reports that he is "obsessed with trains". Based on that information alone, the school psychologist believes that he has ASD.
Sunk Costs	Discounting alternative hypotheses due to the amount of time spent on data collection	A school team in a district that encourages RtI for ASD identification has spent considerable time collecting data on a student's lack of response to ASD-specific interventions and does not consider that the lack of response could be attributed to an alternate disability.



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### Skill-Based Errors

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Error	Definition	Example
Integration Errors	Errors based on the limits of working memory	When thinking about multiple assessment results, a school psychologist is unable to simultaneously integrate a child's developmental history and teacher interview with the results.
Knowledge-Based Errors	Errors based on one's lack of knowledge	A school psychologist has not yet received training on the <i>DSM-V</i> and as a result does not know that Social Pragmatic Communication Disorder is a potential differential consideration for ASD
Technical Errors	Technical errors during evaluation or interpretation	A school psychologist uses an incorrect date of birth for a student and as a result mis-scores all her assessments.

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### Systemic Errors

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Error	Definition	Example
Diagnosis Momentum	When passed from person to person, the tendency for a diagnosis to "stick"	A highly transient student is assessed in preschool and provided with an ASD label. Years later, he continues to be served under that label, even though some evaluation data suggest otherwise.
Power of the Majority	Influence of the majority	During a meeting to discuss evaluation findings, the school psychologist is the only person who disagrees that the student has ASD. However, he deemphasizes his data to not rock the boat.
Squeaky Wheel	Influence of outspoken or powerful team members	During a meeting to discuss evaluation findings, the student's teacher and parent continually interrupt discussion to state that they know the student has ASD. As a result, the team is swayed to agree.

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### Assessment-Based Errors

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Error	Definition	Example
Diagnostic Assessment Bias	Errors in symptom interpretation	A school psychologist notes a student's lack of eye contact but fails to correctly attribute that symptom to distractibility
Diagnostic Criterion Bias	Using majority culture as the criterion from which to evaluate symptoms	The <i>DSM-V</i> ASD criteria are used to evaluate the behaviors of a recent refugee from Somalia.
Diagnostic Sampling Bias	Limiting one's diagnostic observations	A child who was referred for evaluation is observed only during independent work times in math class and yet the team concludes that his social characteristics resemble those of ASD.

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Faulty Instruments	Using faulty instruments from which to draw conclusions	A school team bases their diagnosis on SRS-2 results, even though the student's characteristics suggest that this instrument lacks validity for him.
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Error definitions sourced from: Gnys, Willis, & Faust, 1995; Gutkin & Nemeth, 1997; Lucchiari & Pravettoni, 2012; Lilienfeld, Ammirati, & David, 2012; McLaughlin, 2002; Thammasitboon & Cutrer, 2013; Thammasitboon et al., 2013; Trowbridge, 2008; Watkins, 2008; Wilcox & Schroeder, 2015

percent of school psychologists report using RtI information in ASD evaluations (Allen et al., 2008), meaning that they likely received a referral for evaluation after a series of ASD-specific interventions initiated by a team of general educators were unsuccessful. If district or state policy includes proof of a lack of response to evidence-based interventions in eligibility criteria, the eligibility team may be less likely to consider alternate diagnoses if it means the intervention data will be void (Hoover, 2010).

Special education eligibility teams in school settings include general and special education teachers, administrators, parents, and SISPs; each with a different perspective, level of expertise about the disorder in question, and vested interest in the outcome. These team members may be more or less influential in the outcome of the eligibility decision, regardless of what the evaluation data indicate. For instance, a district with a high number of parent lawsuits may have teams who default to the parent's wishes, while a school with an overbearing administrator may put more stock in those opinions than the group consensus. Emotions may also pose a unique threat to the decision-making of school-based teams, who oftentimes have ongoing contact with the student and family. For instance, a team that is evaluating a student from a family with a long-standing relationship with the school may lean toward an "easier to digest" diagnosis to avoid straining relationships. Though it may seem like the quantity of potential errors may prohibit *any* type of accuracy in diagnostic decision-making, fortunately much research has been conducted on how to prevent and remedy these errors. School teams who employ these methods may be more likely to engage in flexible and objective decision-making processes.

**Strategies to reduce decision-making error.** Error reduction strategies have been developed to address heuristic biases, compensate for skill-based errors, counteract the effects of systemic challenges, and address faulty assessment practices. These strategies may be categorized as those that help teams consider multiple hypotheses, encourage conscious reflection, and reduce assessment and skill-based errors. Table 29 provides a summary of error reduction strategies pertinent to diagnostic decision-making.

Table 29

*Remedies for Decision-Making Errors*

Generate Multiple Hypotheses	Generate lists of alternative hypotheses early in the assessment process, rank them, and narrow the list using appropriate diagnostic tests
	Re-Evaluate the data periodically without the primary diagnosis framework to determine if they fit into other diagnostic
	Ask the questions: “What can’t we explain?” and “Are there expected symptoms that are not present” and “Are there unexpected symptoms that are present?”
Engage in Conscious Reflection	Ask questions that would be answered YES or NO if your primary hypothesis was true and questions that would be answered YES or NO if alternate hypotheses were true
	Be aware of the effects of decision-making errors by educating the team and considering potential influence
	Engage in “Diagnostic Pausing” to reflect on the data as a team
	Evaluate potential external influences and pressures and strategize how to combat them if necessary
	Evaluate the emotions involved and discuss their potential impact on decision-making
	Consider multicultural issues and their impact on all aspects of data collection and interpretation
	Consider the consequences of correct diagnoses and misdiagnosis for each differential consideration

Use “non-directional” flowcharts, checklists, and other cognitive aids to help guide the assessment process, limit working memory load, and counteract faulty team dynamics and systemic faults

Reduce  
Assessment  
and Skill-  
Based Errors

Seek second opinions and consultation about data, hypotheses, and assessment practices

Use multiple sources of information including interviews, developmental histories, record reviews, observations, formal assessments, and screeners

Use familiar instruments or be well trained in instruments that you do use. Seek experts to administer or interpret if necessary

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Croskerry, 2003; Davidow, 2000; Graber, 2009; McLaughlin, 2002; McKenzie, 2006; Ruedinger et al., 2017; Thammasitboon & Cutrer, 2013; Trowbridge, 2008; Watkins, 2008

Another, and perhaps the most effective, remedy to reduce error is the presence of clinical expertise (Betan & Binder, 2012; Graber, 2009; Lucchiari & Pravettoni, 2012; Luchins, 2012; Hassan, 2013; Thammasitboon & Cutrer, 2013; Trowbridge, 2008; Watkins, 2008). Though clinical expertise is described as a ready remedy for many common diagnostic errors, what this expertise consists of in school-based evaluations, however, is unclear.

**The role of clinical expertise in diagnostic decision-making.** Clinical expertise and clinical judgment are terms that are often used in diagnostic texts, but that lack a common definition (Betan & Binder, 2010). In the diagnosis of conditions such as ASD, clinical judgment is vital to accurate interpretation and application of qualitative descriptors to individual cases (Betan & Binder, 2010; Graber, 2009; Lord et al., 2006; Luchins, 2012; Rosenburg et al., 2009; Saulnier, 2016; Saulnier & Ventola, 2012; Thornton, 2013; Wiggins et al., 2015). In fact, clinical expertise is so important it is included the strict research-level diagnostic criteria in the Center for Disease Control’s (CDC’s) autism studies (Wiggins et al., 2015).

Clinical expertise has been extensively studied in the nursing field, and definitions, rubrics, and assessments of such expertise have been developed to guide the training and development of nursing students (Lasater, 2011; Sommers, 2018; Tanner, 2006). Tanner (2006) defined clinical judgment as “an interpretation or conclusion about a patient’s needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient’s response” (p. 205). The work of Tanner (2006) was later developed into an evaluation rubric by Lasater (2011), which includes the following components of clinical judgment: Effective noticing (focused observations, recognizing deviations from the expected, information seeking), effective interpreting (prioritizing and making sense of data), and effective responding (calm and confident manner, clear communication, well planned and flexible intervention, skill) and effective reasoning (self-analysis, commitment to improvement). Though the process of obtaining clinical expertise has been well-explored in the nursing field, this same exploration has not yet occurred in the field of clinical or psychological diagnosis.

In terms of psychological diagnoses, clinical judgment is a less well-defined process that is generally described as an intuitive form of reasoning that is more than knowledge and more than experience (Betan & Binder, 2010; Thammasitboon & Cutrer, 2013). This intuition seems to be developed after years of experience, when a clinician integrates and metabolizes clinical patterns, theories, and knowledge (Betan & Binder, 2010; Hassan, 2013; Thornton, 2013). The expert clinician is then able to automatically apply their judgment intuitively and flexibly to new cases (Betan & Binder, 2010;

Thammasitboon & Cutrer, 2013). Expertise doesn't stop at intuition, however; experts also need to use analytical reasoning to confirm or disprove their intuitive first impressions (Betan & Binder, 2010; Hassan, 2013; Thammasitboon & Cutrer, 2013). In analyzing a case, the expert diagnostician frees up cognitive space by ignoring irrelevant material and mentally organizing important information (Betan & Binder, 2010; Thammasitboon & Cutrer, 2013). The expert knows when to rely on intuition and when more in-depth conscious analysis is needed to cross check their hypotheses (Betan & Binder, 2010; Graber, 2009; Thammasitboon & Cutrer, 2013).

It is not clear why clinical expertise develops in some experienced diagnosticians but not in others. It is also unclear whether one can develop or learn clinical expertise outside of years of experience (Betan & Binder, 2010; Graber, 2009). Expert clinical judgments are theorized to happen automatically and without conscious thought (Thammasitboon & Cutrer, 2013; Thornton, 2013). A question remains about whether experts, if prompted to reflect on their intuitive judgments, could put words to them and share that insight with others. If this intuition is illuminated, it could add another layer of supports that assist non-experts with diagnostic decision-making.

**Integrating clinical expertise with decision-making supports.** The most accurate diagnostic decisions appear to be made when experts combine Type 1 and Type 2 reasoning (Hassan, 2013; Lucchiari & Pravettoni, 2012). There exist strategies to assist with bias reduction and data analysis, but what appear to be missing are strategies to compensate for a lack of clinical expertise and intuition.

Though non-experts can make sound diagnostic decisions, the process tends to be lengthy and error-prone. Flowcharts, checklists, diagrams, and other cognitive aids improve the efficiency and accuracy of Type 2 reasoning (Graber, 2009; Hassan, 2013; Lucchiari & Pravettoni, 2012; McLaughlin, 2002; Thammasitboon & Curer, 2013; Watkins, 2008) and it stands to reason that similar supports based on clinical expertise may also improve Type 1 reasoning. Step-by-step and directional guidelines may inhibit experts from using their judgment, keep non-experts from developing expertise, and can lead to error in atypical situations (Lucchiari & Pravettoni, 2012; Thammasitboon & Curer, 2013). Due to these possibilities, decision-making supports should be non-directional and limit step-by-step processes. One recommended non-directional support is a cognitive map (Hassan, 2013; Lucchiari & Pravettoni, 2012; Papageorgiou, 2010).

**Cognitive maps.** Cognitive maps (also referred to as concept maps) are visual representations of complex mental states or thought processes. Cognitive maps contain two structures: Concepts and Relationships (Nalchigar, Nasserzadeh, & Babak, 2011). In diagnostic processes, cognitive maps can be useful aids in both illustrating the thought processes and strategies of experts, and in reducing the hefty working memory load that is attributed to many decision-making errors (Hassan, 2013; Maule & Maule, 2016). These cognitive illustrations can in turn assist lay decision-makers in making sound diagnostic decisions (Gerdeman, Lux, & Jacko, 2012; Kaddoura, Vandyke, Cheng, & Shea-Foisy, 2016; Maule & Maule, 2016). To further support the use of cognitive maps as diagnostic decision-making aids, novice diagnosticians may more quickly develop expertise from the use of cognitive maps early in their careers (Gerdeman, Lux, & Jacko,



2012; Kaddoura, Vandyke, Cheng, & Shea-Foisy, 2016). In the realm of differentiating ASD from other childhood conditions, cognitive maps that integrate the knowledge of clinical experts may be used as a decision-making supplement that, in addition to data analysis, teams can study when determining to which condition a constellation of symptoms may be attributed.

### **Summary**

Accurate identification of ASD is critical for proper service provision, allocation of resources, continuity of care, research, and communication between professionals (Dowdy et al., 2009; Eldevik et al., 2009; Metzger et al., 2009). Though schools are the primary setting that many students receive their initial assessments for ASD, schools may face a variety of challenges when it comes to accurately differentiating between ASD and related conditions (Kremen, 2013; Reynolds, 2011; Sullivan, 2013).

First, the terminology that defines ASD and other childhood conditions as well as associated symptoms overlap on multiple dimensions. Heterogeneity in diagnostic presentation as well as individual and environmental variables may further cloud diagnostic certainty. It is through the evaluation process that teams analyze observational, anecdotal, and formal assessment data to determine the source of a student's challenges. However, many well-known assessment tools lack the specificity necessary to properly differentiate many conditions (Cholemkey, Mojica et al., 2014; Hus et al., 2013; Moody et al., 2017). One then must rely on their own judgment in interpreting assessment results (Betan & Binder, 2010; Luchins, 2012; Saulnier, 2016; Thornton, 2013; Wiggins et al., 2015).

Second, the possibility of errors and biases in diagnostic decision-making haunts all diagnosticians. These errors and biases include those of faulty analytics, limits of human processing, systemic challenges, as well as heuristic biases based on one's own experiences, beliefs, or automatic thought patterns (Betan & Binder, 2010; Lucchiari & Pravettoni, 2012; Luchins, 2012; Thammasitboon & Cutrer, 2013).

Finally, unique variables that schools face may provide a third challenge to accurate identification of a student's needs. These challenges may include a lack of access to specialized tools, diagnosticians who engage in diverse professional roles at the expense of expertise, emotional and ongoing involvement with evaluation cases, systemic pressures to provide certain diagnoses, and limited evaluation timelines.

Clinical expertise may mitigate many of the challenges listed above. During an evaluation process, expertise allows a diagnostician to automatically recognize patterns in complex symptom constellations, which may counteract heuristic biases (Betan & Binder, 2010; Thammasitboon & Cutrer, 2013). When an expert can rely on their intuition to make initial clinical impressions, it frees up mental capacity so that there is more space to integrate a broad array of assessment results (Betan & Binder, 2010; Thammasitboon & Cutrer, 2013). Making accurate initial impressions also decreases the time that might otherwise be used following several paths to diagnostic dead ends. Finally, those with clinical expertise may be able to overcome systemic challenges such as administrative pressure.

Though the role of clinical expertise is vital to accurate diagnostic decision-making, it is thought to be an unconscious process that lacks a clear definition. This

raises the question if expert thought processes during the differentiation of ASD from other conditions can be given form. If so, can the illumination of such clinical expertise be turned into a tool to help non-experts make more sound diagnostic decisions?

### Chapter 3: Method

Clinical expertise is vital in improving Type 1 reasoning to determine whether ASD or another condition is the root cause of a student's constellation of symptoms (Falkmer et al., 2013; Saulnier & Ventola, 2012; Wiggins et al., 2015). To assist school teams who may lack clinical expertise yet are still in a position of providing an educational diagnosis, this study sought to illuminate the clinical *knowingness* and identify the decision-making factors that experts agreed were the most important in differentiating the symptoms of ASD from those of other related conditions during school-based evaluations. The overarching question of this study was to explore how clinical and school-based experts in the field of ASD evaluation use clinical judgment in the process of diagnostic decision-making. To determine the process, the following questions were posed:

1. What characteristics of ASD do experts agree are most important to consider when using clinical judgment in the process of symptom differentiation?
2. How do experts decide whether the aforementioned characteristics are attributed to ASD rather than to another condition?
3. What sources of information do experts use to confirm or reject their clinical judgment in the process of diagnostic decision-making?

## **Delphi Method**

The Delphi method (Dalkey, 1969) is uniquely suited to answer questions regarding aspects of decision-making when there are no formal guidelines already in use (Cole, Donohoe, & Stellefson, 2013). Developed in the 1950s as an attempt to improve research involving face-to-face group discussion, this method has become increasingly common in qualitative and mixed-methods research (Brady, 2015; de Meyrick, 2003; Dalkey, 1969; Macmillan, 1971). The Delphi method uses rounds of iterative questioning and feedback presented to a panel of experts, who remain anonymous to one another, to reach an informed group consensus about a complex problem (Dalkey, 1969; de Meyrick, 2003; Linstone & Turoff, 1975). This consensus is then considered the most valid answer to the posed questions (de Meyrick, 2003). This methodology is based on the adage “two heads are better than one” and strives to limit the effects of dominance, lack of anonymity, and tangential conversation that occur during group problem solving (Dalkey, Brown, & Cochran, 1969).

The theoretical underpinnings of the Delphi method lie with philosophers such as Locke, Hegel, and Dewey, who asserted that subjective human experience is an important companion to observable data (Brady, 2015). This method is particularly suited for opinion-based research questions that lie somewhere in the grey area between factual knowledge and pure speculation, and for which potential sample sizes are too small to allow for surveys or other forms of empirical research (Brady, 2015; Dalkey et al., 1969; de Meyrick, 2003; Cole et al., 2013). Understanding the decision-making processes and Type I reasoning of experts when it comes to diagnostic decision making is one of those

“grey area” questions that make the Delphi method a good fit for this study. To date, there are no known guidelines that illuminate thought processes accompanying a suspicion that a group of symptoms might be attributed to a condition other than ASD. Though there are likely a myriad of opinions that experts hold regarding differential decision-making, the collaborative and consensus-seeking approach of Delphi may lead to stronger guidance in this area than could one opinion alone.

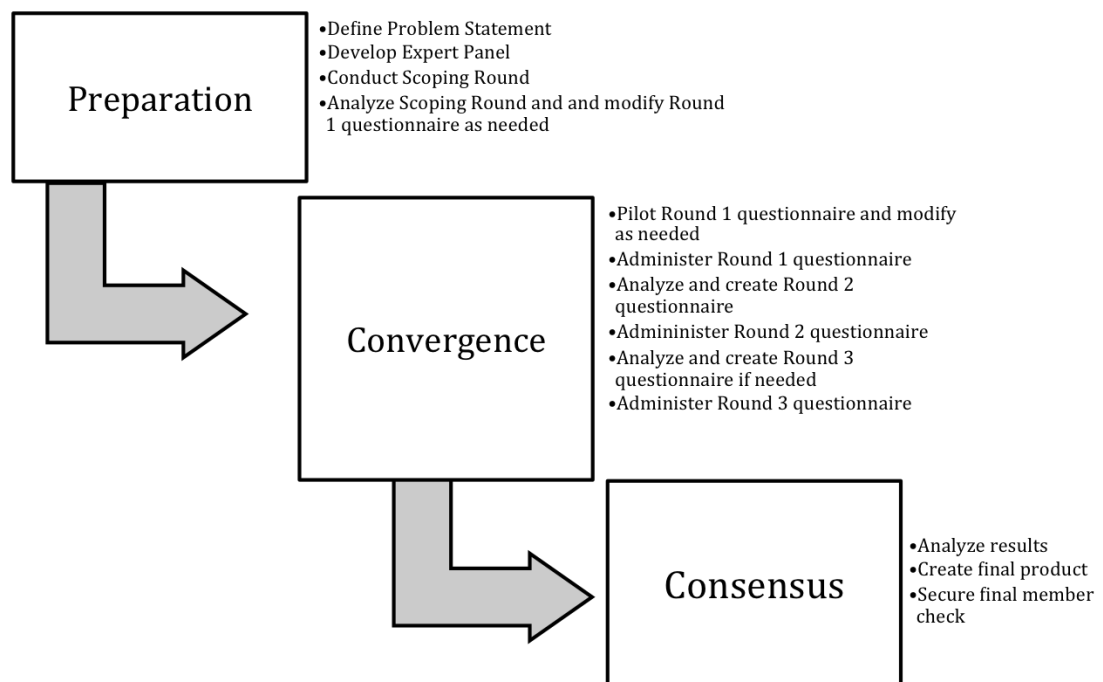
The basic tenants of the Delphi method as designed by Dalkey (1969) and others remain true today (though there are wide variations in practice) and include repeated questioning of participants, anonymity, and controlled feedback (de Meyrick, 2003). Many authors agree that three rounds of questioning is sufficient to obtain consensus; it is unlikely that outliers will change their opinions after the third round (Day & Bobeva, 2005; de Meyrick, 2003; Linstone & Turroff, 1975). The first round of questioning, often open-ended in nature, is designed to generate a wide range of ideas about the topic or problem and to develop future questionnaire rounds (Hsu & Sandford, 2007; de Meyrick, 2003). The second round of questioning uses information obtained from Round 1 and involves controlled feedback to participants about the group’s responses and the ability for participants to rank or otherwise comment on the responses of others (Winzenried, 1997). The controlled feedback of rounds two and three should give participants a sense of whether the group is approaching consensus, any outlying responses, and allow for exploration of significant disagreements (de Meyrick, 2003; Winzenried, 1997). During this round, participants can change their original answers, stand by their original responses, or comment on answers that differ (Uhl & Educational Testing Service, 1971).

The third round can either be similar to the second round if more work is needed to reach consensus, or it may seek final evaluation of the group answers (de Meyrick, 2003).

Brady (2013) asserts that to increase rigor in qualitative Delphi studies, participants should always have the opportunity to check the end product for accuracy.

### Study Design

For this study, twenty experts in school-based and clinical ASD identification and diagnosis were recruited to engage in a Delphi-based group decision-making process in order to uncover the most essential aspects of differentiating ASD from other conditions. This study followed the three-stage Delphi procedure as outlined by Donohoe and Needham (2009), which includes preparation, convergence, and consensus. See *Figure 2* for a visual representation of this study's model.



*Figure 2.* Study Procedures.

After an initial “*Scoping*” (Donohoe & Needham, 2009, p. 424) process, three rounds of iterative questionnaires were administered to study participants. Although many Delphi methodologists agree that after three rounds participant responses remain stable (Day & Bobeva, 2005; de Meyrick, 2003; Donohoe & Needham, 2009), ~80% or higher and 50% or lower consensus was the target for questioning to cease for each item, though this was adjusted in later rounds due to low participant enrolment. Participants had several weeks to complete each questionnaire. After the results were analyzed and compiled, participants had the opportunity to check the final product for accuracy. Total participant involvement ranged from 12 months for the first recruits to 6 months for the last recruits. Results were formed into several tables and cognitive maps that illustrated expert thought processes during differential decision-making.

### **Respondents**

The recommended number of Delphi participants is 15-35, though as few as seven and as many as thousands have been reported (Day & Bobeva, 2005; Donohoe & Needham, 2009; Gordon, 2003). Donohoe and Needham (2009) assert that the accuracy of Delphi studies improves with larger panel sizes and suggest starting with more participants than the ideal number due to the tendency for Delphi studies to experience high rates of attrition. Donohoe and Needham (2009) further assert that by recruiting more than the ideal number of participants, researchers may retain those most interested in the study after first round attrition. For this study, twenty experts in the fields of school and clinical ASD identification and diagnosis were recruited. Eleven participants were



recruited from Group A: experts who practice in a clinical setting (Clinical Experts) and nine from Group B: experts who practice in a school setting (School Experts).

The careful and well-executed selection of expert participants is vital to improving trustworthiness in Delphi studies (Day & Bobeva, 2005; de Meyrick, 2003; Gordon, 2003 Linstone & Turoff, 1975; Powell, 2003). Gutierrez (1989) defines experts as “A group of knowledgeable people: Those who can provide relevant input to the process, have the highest authority possible, and who are committed and interested” (p. 33). Quality experts should have a depth of knowledge, allowing each to contribute more than a guess, as well as a breadth of knowledge, allowing for each to have knowledge about different aspects of the problem (Donohoe & Needham, 2009; Linstone & Turoff, 1975; Still, May & Bristow, 1999). School-based and clinic-based psychologists were chosen as the target participant demographic due to their specialized training in assessment and diagnosis. Including psychologists who practice in two different settings allowed for a breadth of knowledge, but more importantly focusing on psychological knowledge allowed for a substantial depth of discussion. Table 30 summarizes the inclusionary and exclusionary criteria for each group of respondents.

Table 30

*Inclusionary and Exclusionary Criteria for Study Participation*

<u>Group</u>	<u>Inclusionary Criteria</u>	<u>Exclusionary Criteria</u>
Clinical Experts	Is a psychologist who practices in a clinic, university, or hospital setting. Works at least half time in a clinical, university, or hospital setting that provides ASD diagnoses OR supervises ASD diagnoses in a clinical setting	Is not a psychologist; does not practice in a clinic or hospital setting.  Works less than half time; does not currently work in the field of ASD diagnosis in a clinical, hospital, or university setting

School Experts

OR teaches ASD diagnosis in a university setting  
AND has 3 or more years of professional experience independently conducting ASD evaluations within the past 5 years

AND has conducted or has overseen at least 20 ASD evaluations in the past three years

AND practices within the USA

Is a psychologist or school psychologist who practices in a public school setting.

Works at least half time in a school setting as a school psychologist or ASD specialist

AND has 3 or more years of independent/fully licensed experience in a school setting within the last 5 years

AND has participated in at least 20 evaluations for INITIAL consideration of ASD in the past 3 years

AND works in a public school setting in the USA

Has fewer than 3 years of professional experience independently conducting ASD evaluations; is still being supervised; has 3 or more years of experience conducting supervised ASD evaluations; has more than 3 years of experience, but not within the past 5 years

Has conducted or overseen fewer than 20 ASD evaluations in the past three years

Does not practice within the USA

Is not a psychologist or school psychologist; does not practice in a public school setting.

Does not work at least half time; does not work in a public school setting

Does not have at least 3 years of experience in a school setting; experience is not within the last 5 years; has had a provisional or intern license for all or part of the three years

Has conducted fewer than 20 ASD evaluations in the past 3 years; at least 20 evaluations have not been for consideration of ASD; a portion of the 20+ evaluations have not been for an INITIAL ASD consideration

Does not work in a public school setting; works outside of the USA

**Recruitment.** Purposive and snowball sampling are the most commonly used strategies in Delphi studies (Day & Bobeva, 2005; Donohoe & Needham, 2009; Gordon, 2003). This study used these forms of sampling to recruit both clinical and school psychologists. The procedures for each group varied slightly due to differences in expert databases. Following is a discussion of school and clinical expert recruitment procedures.

***Clinical expert recruitment.*** Experts in the field of ASD evaluation were contacted through a directory of LEND (Leadership Education in Neurodevelopmental and related Disabilities) centers located within the Association of University Centers on Disabilities (AUCD) website (LEND Directory, n.d.). LEND programs form a nationally recognized network of training centers designed to improve identification of and services for children with neurodevelopmental disabilities. Located on the LEND and AUCD websites are member directories that allow custom searches, including those of self-identified experts in ASD evaluation. All self-identified experts in ASD evaluation who also identified as practicing psychologists located on these directories were sent the recruitment email (Appendix A).

***School expert recruitment.*** School-based psychologists were the target group of school-based experts due to their specialized training in a variety of diagnostic assessment tools and their prominent role on school-based assessment teams. Unlike clinical experts, there is not a database of districts or psychologists that are nationally recognized for their ASD services. School-based participants were recruited through internet searches for district autism evaluation teams and school-based mental health teams across the United States. Introductory emails were sent to the team contacts, and

recruitment emails were sent to individuals identified by the autism or mental health team contact. Snowball sampling was also used when individuals who received the recruitment emails wrote back and suggested that I contact other individuals they knew who were experts in school-based autism evaluations.

***Recruitment procedures.*** Each recruitment contact began with a recruitment email (Appendix A), a link to a statement of informed consent (Appendix B), and eligibility/demographic survey through the *Qualtrics*<sup>TM</sup> online survey generator. Each interested participant had the opportunity to read the recruitment letter and agree to the study conditions before moving onto the eligibility and demographic surveys.

Each group of experts received the same recruitment email, followed by an eligibility criteria survey tailored to their area of expertise, and the same set of demographic questions. The recruitment email included details about the purpose of and need for the study, the final product, and an overview of the Delphi method. Iterative questioning procedures were discussed in detail so that the participants would know that there was a potential for completion of up to four rounds of questionnaires over several months. Following the study introduction letter, participants were asked if they wished to proceed to informed consent and consideration of eligibility for the study.

Participants who wished to continue after reading the statement of informed consent were prompted to select a link that took them to the eligibility and demographic survey. The eligibility surveys for each expert group followed the criteria listed in Table 30. The eligibility survey was designed in such a way that at any point a potential respondent did not meet criteria, they were thanked for their time and the survey was

discontinued. If the participant met all eligibility criteria, they were immediately directed to the *Scoping Round* (Appendix C) questionnaire. As recommended by Gordon (2003), to limit attrition a follow-up email was sent after completion of the *Scoping* questionnaire. This email included a personal contact from myself thanking the expert for their participation and making myself available to answer any questions.

### **Participant Demographics**

Nine school-based psychologists and 11 clinic-based psychologists completed the *Scoping* questionnaire. Of those participants, six school psychologists and two clinical psychologists remained through the duration of the study and completed the Round 3 questionnaire. As the bulk of the qualitative data came from the Round 1 questionnaire, those 15 participants' demographics will be discussed below.

All US geographic regions were represented by the Round 1 participant pool. Most participants identified as White (100%) females (93%). Participant ages ranged from 29 to 65 years of age, and years of experience in conducting ASD evaluations ranged from three to 33. Four participants were Educational Specialist level practitioners, and 11 were Doctorate level practitioners. Participants engaged in a wide variety of professional roles including conducting evaluations for suspected ASD (94%), supervising others who conduct evaluations for suspected ASD (60%), and teaching graduate students how to conduct evaluations for ASD (47%). Of the clinic-based psychologists, eight practiced in a clinical setting, three practiced in a hospital setting, and six practiced in a university setting. Many clinical participants practiced in multiple settings and engaged in multiple roles. Table 31 summarizes participant demographics.

Table 31

*Participant Demographics*

<u>Characteristics</u>	<u>Clinical Participants</u>	<u>School-Based Participants</u>	<u>Total</u>
Region			
West	1	3	4
Midwest	2	1	3
South	2	0	2
Northeast	2	2	4
East	2	0	2
Gender			
Male	1	0	1
Female	8	6	14
Race/Ethnicity			
White	9	6	15
Age			
Minimum	29	33	29
Maximum	65	63	65
Mean	50.1	43.6	46.85
Years of Experience			
Minimum	4	4	4
Maximum	33	18	33
Mean	15.7	9.5	12.6
Degree			
Educational	2	2	4
Specialist			
Doctorate	7	4	11
Role <sup>a</sup>			
Conducting ASD Evaluations	9	5	14
Supervising	6	4	10
Others who Conduct ASD Evaluations			
Teaching ASD Evaluations at the Graduate Level	6	0	6

*Note: <sup>a</sup> Respondents could identify themselves in more than one category*

### Instrument Development

As recommended by Donohoe and Needham (2009), the first round of questioning, *Scoping*, should present participants with a brief summary of the literature

review and a problem statement. Participants should then be asked to respond to the problem statement or open-ended question. Based on these results, the researcher develops the next rounds of questioning. For this study, the overarching question, “*How do clinical and school-based experts in the field of ASD evaluation use clinical judgment in the process of diagnostic decision-making?*” and research question 1, “*What characteristics of ASD do experts agree are most important to consider when using clinical judgment in the process of symptom differentiation?*” formed the foundation of the *Scoping* round. See Appendix C for the *Scoping* round problem statement and questions.

**Pilot.** Themes and questions that emerged from the *Scoping* round analysis, a review of literature regarding differential diagnosis of ASD, best practices in school-based evaluation, and the remaining two research questions were used in the creation of the first draft of the Round 1 Questionnaire. This questionnaire focused on nine conditions that may require differentiation from ASD during a school-based evaluation (SLI, SLD, ADHD, TBI, ID, IG, Mood disorders, Anxiety disorders, and Childhood Onset Schizophrenia). Though there are several additional conditions that may require differentiation from ASD, these nine conditions were chosen due to their alignment with IDEA disability categories, frequency of occurrence in the general population, and/or presence of the most literature that discussed difficulties distinguishing the condition from ASD. A larger representation of conditions was not included to keep the questionnaire as brief as possible and to attempt to limit attrition.

This questionnaire was administered to three individuals who did not qualify for the study, but who each had several years of clinical and school-based experience evaluating students with autism. The pilot participants were asked to complete the questionnaire and provide feedback on the length of time it took, question clarity, technological issues, and general impressions about the questions. Based on pilot participant feedback, a back button was added to the survey, and the definition of “red flags” was included on each page rather than just once at the beginning. Further, one pilot participant wanted clarity about how long she was expected to spend on each response. She said she “could have spent hours going through old textbooks and thinking about past cases for each answer, but [didn’t] think that was feasible for all participants” to do so as it would have led to a very lengthy response time. In response to this feedback, a statement of expected survey completion time (60-90 minutes) and the following description were added: *Please write as much as you would like in response to each question, and take as much time as you would like, but also know that a brief list of examples that come to mind immediately is also acceptable. As this questionnaire is designed to tap into clinical judgment, intuitive responses are preferred to answers from diagnostic texts.* The modified Round 1 questionnaire was re-sent to pilot participants for feedback on the wording of the additions, and no further changes were suggested. As a result, the final Round 1 questionnaire (Appendix D) was created.

### **Data Collection and Analysis**

Prior to administration of the *Scoping* round, IRB approval was obtained with expedited review status. Each round of subsequent questionnaires was preceded by a new



informed consent process. Including the *Scoping* round, a total of four rounds of questionnaires and a final member check were administered to participants over a 12-month time-period and followed the Preparation, Convergence, and Consensus model as outlined by Donohoe and Needham (2009).

**Preparation: *Scoping*.** The *Scoping* round was presented in tandem with the eligibility and demographic questionnaires and consisted of a presentation of the problem statement and two open-ended questions. These questions were designed to uncover expert perceptions of the essence of clinical judgment in differentiating symptoms of ASD from those of other conditions as well as the features of ASD that are most important when using one's clinical judgment in the evaluation process. In all, of the 20 participants who were eligible for the study, 20 of them completed the *Scoping* questionnaire. Due to difficulty recruiting a suitable number of participants in the designated time frame, the *Scoping* round was intended to span approximately one month, but in the end lasted four months.

Responses for the first question were coded and analyzed for themes using the "Process Coding" techniques outlined by Saldaña (2009, pp. 83-86). Process coding was chosen as an ideal analysis technique for the complex data in *Scoping* question one, given its utility in small scale projects designed to solve a problem or reach a goal (Saldaña, 2009). The second question in the *Scoping* round yielded lists of symptoms and characteristics rather than complex information. "Structural Coding" procedures were used for question 2 analysis as recommended by Saldaña (2009, pp. 73-76) as techniques suitable for data that is to be re-analyzed with semi-quantitative methods such as

frequency counts. Structural coding procedures allowed me to capture all participant ideas, while also obtaining accurate frequency counts, vital to analysis of consensus. Please refer to Appendix E for examples of the coding procedures used in this study.

Codes and themes developed during the *Scoping* analysis were checked by a third-party individual who was highly familiar with qualitative research. This individual was asked to analyze my coding and pay particular attention to inclusion of all participant ideas, neutralization of language, and lack of oversimplification. With this feedback, final themes were developed. Those themes as well as my own thoughts and questions that arose during coding and analysis were used to form the Round 1 Questionnaire. However, in an attempt to reduce the length of the Round 1 questionnaire, participants were not asked to vote on whether or not they agreed or disagreed with the themes and concepts obtained in the *Scoping* analysis until Round 2.

**Convergence: Round 1.** The initial Round 1 questions underwent an informal pilot process, where two experts were asked to read the questions and provide feedback on clarity and utility in capturing the essence of my research questions. When the final questions were developed, A *Qualtrics*<sup>TM</sup> link to the Round 1 questionnaire was emailed to participants. Participants were initially given two weeks to complete Round 1, but to maximize response rates, this was extended to five weeks. Of the 20 of the participants who completed the *Scoping* round, 15 completed the Round 1 questionnaire.

Round 1 data were analyzed using “Structural Coding” procedures as well as frequency counts and percentage calculations (Saldaña, 2009, pp. 73-76). A third party individual, highly familiar with both qualitative research methodology and autism

terminology was asked to examine my codes with particular attention paid to inclusion of all participant ideas and oversimplification. Feedback was incorporated, and the codes and themes were used to create the Round 2 questionnaire.

**Convergence: Round 2.** In Round 2, participants were presented with the aggregated data obtained in the *Scoping* and Round 1 questionnaires and prompted to review all concepts presented by the group in the *Scoping* and Round 1 questionnaires as well as the percentage of respondents who listed each concept and mark whether they agreed or disagreed with each concept. Follow-up questions were also asked about select themes uncovered during Round 1 analysis. Participants were emailed a *Qualtrics*<sup>TM</sup> link to the questionnaire and had ten days to respond, though this was extended to 19 days to maximize response rates. Of the 15 participants who completed the Round 1 questionnaire, 13 completed the Round 2 questionnaire. The Round 2 Questionnaire can be found in Appendix F.

Analysis of Round 2 data consisted of frequency counts and percentage calculations for agree/disagree questions. The answers for open-ended follow-up questions were compiled into paragraphs that encapsulated all concepts presented by participants.

**Convergence: Round 3.** The Round 3 questionnaire included a summary of the aggregated data from Round 2. Data obtained in Round 2 were summarized and participants had the opportunity to review concepts that had reached inclusionary (70% or higher agreement) or exclusionary (<50% agreement) consensus, agree or disagree with each concept that had not yet reached consensus, and make comments or suggestions.

Participants were emailed a *Qualtrics*<sup>TM</sup> link to the questionnaire and had ten days to respond, though this was extended to 84 days after several school-based psychologists requested extensions due to heavy end-of-the-year workloads. Of the 13 participants who completed the Round 2 questionnaire, 8 completed the Round 3 questionnaire. Please see Appendix G for the Round 3 questionnaire.

Data from the Round 3 questionnaire were analyzed with frequency counts and percentage calculations. Final determination of inclusionary and exclusionary consensus was made, and the results were used to create the decision-making support document.

**Consensus: Final member check.** The results of the data collection rounds were represented through tables and cognitive maps. Cognitive maps are especially suited for representation of the results of this Delphi study, as their purpose is to visually represent the verbal thought processes of experts in order to support decision-making (Lucchiari & Pravettoni, 2012). Participants were emailed a Word<sup>TM</sup> version of the final document and had 10 days to submit edits. Two participants sent positive feedback (e.g. "... I do not have any edits, I think is very well organized and thorough"); otherwise, no edits were suggested.

### **Trustworthiness**

Brady (2015), in his exploration of improving rigor in Delphi studies, makes several suggestions for increasing trustworthiness. First, to address dependability Brady (2015) asserts that the iterative and consensus-seeking nature of Delphi studies in and of itself acts as a form of triangulation as participants review and confirm data throughout the study. I also addressed dependability by having a 3<sup>rd</sup> party examine my coding

process and decisions. Second, careful and strategic selection of experts is vital in trustworthy Delphi studies (Brady, 2015). To address the credibility of this study, I developed stringent inclusionary and exclusionary criteria to ensure that only the most qualified experts were recruited. Credibility was also addressed by having the participants conduct a member check of the final product. Finally, Brady (2015) suggests keeping a methods journal so that every decision is carefully documented in a way that others can review the logic behind each methodological decision. To address confirmability, all research decisions have been documented in this Method chapter and a detailed notebook of all coding decisions was kept. Further, my own bias was explored and addressed prior to and throughout the data collection and analysis process.

### **Addressing Bias**

Examining and addressing researcher bias is an essential component of any qualitative research study. It was vital for me to explore and disclose any potential biases that may have influence my interpretation of study results. Following are potential sources of personal bias.

One source of bias lies in my own experience with ASD diagnosis in the schools. For the past several years, I have worked primarily with ASD programs as a school psychologist. One of these years was spent on a district ASD diagnosis team. A recurring frustration I have encountered in my work has been in dealing with misidentification, both as assessor who has worked to consult school-based teams who are “sure” the student in question has ASD, and in my role in ASD classrooms, which are becoming overloaded with children who seem not to have true diagnoses. Oftentimes, I read

educational or even clinical evaluations of children where it was clear that only an ASD diagnosis was considered and contrary data were ignored. Through these experiences and frustrations, I have developed my own form of “clinical expertise” as well as strong feelings about misidentification. It was important for me to separate my own personal beliefs from the analysis procedure.

To address both these biases, I ensured that respondent names and demographic information were removed from their responses before I begin analysis. Further, I made sure to include *all* participant responses and emerging themes in the analysis process. This helped to ensure that the responses of all participants were given equal treatment. Finally, I had a third party individual familiar with qualitative analysis review my coding with equal treatment of participant response in mind.

### **Limitations**

De Meyrick (2003) and Donohoe and Needham (2009) list several limitations that may present themselves in Delphi research including those of participant selection, attrition, reduction of complexity, and poor instrument wording. Those as well as limitations involving recruitment, time constraints, and scope of participant expertise that may have influenced the results of the study were considered and are addressed in Chapter 5.

### **Final Product and Decision-Making Guide**

The end results of the four sets of questionnaires were developed into several tables and corresponding cognitive maps that illustrate the relationship between the symptomology of ASD and related disorders. Each cognitive map was created using

MindNode™ technology and worked as a visual display that integrated core ASD terminology with terminology that represented shared and differentiating characteristics of each related condition. Each map was created with a similar lay-out where the core ASD terminology was on the right of the map, shared characteristics were in the upper left quadrant, and differentiating characteristics were in the lower left quadrant.

The tables and cognitive maps were compiled into a guide entitled, *Beyond Test Results: Developing Clinical Judgment to Differentiate Symptoms of Autism Spectrum Disorders from Those of Other Childhood Conditions*. This decision-making guide is presented in Appendix H, and its implications for school psychologists are discussed in the Chapter 5.

## Chapter 4: Results

Results from this study represent the collective opinions of a group of experts from across the country pertaining to the use of clinical judgment in differentiating symptoms of ASD from those of other childhood conditions. In this chapter, the process of obtaining exclusionary and inclusionary consensus for several concepts set through four rounds of questioning will be discussed in detail. Supplemental between-group analyses were also conducted, and those results will be discussed at the conclusion of this chapter.

### **Scoping Results: Clinical Judgment and ASD Characteristics Most Important to Differentiation**

The purpose of the *Scoping* round was to answer the overall research question (*How do experts use clinical judgment in the process of diagnostic decision making?*) and research question 1 (*What characteristics of ASD do experts agree are most important to consider when using clinical judgment in the process of symptom differentiation?*).

During this round, participants were introduced to the study problem and asked questions designed to gain a general understanding of their perceptions about how clinical judgment is used as well as which features of ASD that stand out most when using clinical judgment. Participants were first presented with the following statement to provide them with an overview of the study and its purpose: *Leading experts in ASD diagnosis agree that one cannot rely on test scores alone to determine whether a*



*student's symptoms are due to ASD or another condition. Rather, it is a combination of test scores, developmental history, careful observations, and most importantly "clinical judgment" that leads to the most accurate diagnosis (Lord et al., 2006; Reaven et al., 2008; Saulnier & Ventola, 2012; Wiggins et al., 2015). Similar terminology is used to describe the symptoms of multiple conditions, with the expectation that the examiner will be able to use his or her clinical expertise to differentiate subtle differences in presentation. Often, the difference between a problem resulting from ASD and the same problem resulting from another condition is something an expert in ASD just knows, but cannot quantify through formal testing. In order to assist school teams who may lack clinical expertise yet are still in a position of providing an educational identification, this study seeks to identify the decision-making factors that experts agree are the most important in differentiating the symptoms of ASD from those of other conditions. The overarching question of this study is to explore how experts in the field of ASD evaluation use clinical judgment in the process of diagnostic decision-making. The results of this study will be used to create decision-making supports for school teams to use during assessment of students with ASD.*

After reviewing this statement, participants were asked to answer two open-ended questions. Question 1 asked, *"Think back to times in your professional career that you have received a referral for a child with suspected ASD who was ultimately determined to have another condition. During such situations, how did you use clinical judgment to support the process of differentiating ASD from other conditions?"* Question 2 asked,

*“What symptoms of ASD are the most important to consider when using clinical judgment during diagnostic decision-making?”*

**How experts use clinical judgment.** The coded and analyzed responses for Question 1 represented 16 total concepts, each earning an initial eight to 79% agreement among participants. Concepts were grouped under the following broad categories: *Assessment Practices, Cognitive Processes, Experience and Knowledge, Personal Feelings, and Consultation and Collaboration*. The concepts and percentage of agreement among participants were re-presented to participants during Rounds 2 and 3 during which time participants were asked to agree or disagree with each concept. Of the 16 initial concepts, 14 earned final consensus, which was defined as a 78% or higher agreement rate. The percentage of agreement required for inclusionary consensus during Round 3 was changed from 78 to 70 due to low participant enrollment. For Round 2, concepts that with an agreement rate of 50% or less earned exclusionary consensus and were dropped. Given that participants are unlikely to change their mind after the 3<sup>rd</sup> round of questioning (Day & Bobeva, 2005; de Meyrick, 2003; Linstone & Turroff, 1975), in Round 3, concepts that did not reach at least 70 agreement were dropped. Table 32 displays the concepts and the process of obtaining inclusionary or exclusionary consensus for each concept from Round 1 to Round 3.

**Characteristics of ASD most important to differentiation.** After coding and analysis, the responses for Question 2 represented four broad categories (*Quality of Social Engagement, Communication, Restricted and Repetitive Behaviors, and Other*) and 26 total concepts. Each concept represented an initial five to 100% response rate

among participants. The concepts and percentage of initial response rate were re-presented to participants during Rounds 2 and 3. Of the initial 26 concepts, 19 earned final consensus. Table 33 displays the Question 2 concepts and process of earning inclusionary or exclusionary consensus. In Round 2, responses that earned percentages of agreement of 78% or higher were considered to have reached consensus. Due to the low number of Round 3 participant enrollment, the percentage of agreement needed for consensus was changed from 80 to 70.

Table 32  
*Scoping Question 1: How is Clinical Judgment Used in the Process of Diagnostic Decision Making?*

<u>Concept</u>	<u>% of Concepts Listed During Scoping</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
<b>Assessment Practices</b>			
Integrating and comparing/contrasting formal and informal test data	42	100*	
Delving into early development and past experiences through interviews and record review	42	100*	
Observing in multiple environments	37	83*	
Looking at the consistency of behaviors across contexts and throughout time	21	83*	
Selecting and cross-checking with diagnostic tests	16	50-	
<b>Cognitive Processes</b>			
Considering biases and preconceptions	16	92*	
Keeping an open mind at the outset and letting data guide decision-making	11	83*	
Understanding that standardized assessments alone aren't enough to be accurate	11	100*	
Using the DSM-V as a starting point to guide decision-making	11	66	86*
Detecting struggle to make things fit into a certain category leads to consideration of different possibilities	5	42-	
<b>Experience and Knowledge</b>			

Applying knowledge of several conditions to analyze symptom crossover, fit, and misfit	79	100*
Linking past experiences/knowledge to current case	37	100*
Recognizing the influence and strength of key characteristics	5	83*
<b>Personal Feelings</b>		
Noticing the personal qualitative experience of working with the child	16	83*
<b>Consultation and Collaboration</b>		
Utilizing a transdisciplinary assessment and data analysis approach	11	81*
Consulting with other experts	5	81*

*Note: \*=Concept Earned Consensus - =Concept Eliminated*

Table 33

*Scoping Question 2: What Symptoms of ASD are the Most Important to Consider When Using Clinical Judgment?*

<u>Concept</u>	<u>% of Concepts Listed During Scoping</u>	<u>Round 2 Agreement %</u>	<u>Round 3 agreement t %</u>
<b>Quality of Social Engagement</b>			
Limited social reciprocity	32	100*	
Unusual quality of social engagement	21	100*	
Lack of spontaneous social reciprocity	16	81*	
Limited desire to share/socially connect with others	16	72	71*
Poor or atypical response to social overtures	16	100*	
Difficulty engaging in joint attention	5	90*	
Integration of social behaviors	5	54-	
Limited understanding and use of social microbehaviors	5	72	100*
Atypical eye contact	5	54	71*
<b>Communication</b>			
Atypical social communication	37	100*	
Poor integration and use of verbal with nonverbal behavior	26	100*	
Stereotyped/repetitive language	11	90*	
Atypical conversation skills	5	63	100*
Atypical pragmatic language	5	81*	
Unusual prosody	5	72	86*
<b>Restricted and Repetitive Behaviors</b>			
Repetitions in play, speech, and/or self-stimulatory mannerisms	63	100*	

Unusual, intense, and restricted interests	42	100*	
Rigid adherence to sameness and routine	21	81*	
Sensory differences	16	63	29-
Poor play and use of imagination	11	72	86*
<b>Other</b>			
Atypicality in the course of early social, language, and sensory development	16	100*	
Consider continuum of symptoms within ASD severity and age	16	54-	
Atypical patterns of strength and weakness in cognitive profile	11	54-	
Consider impact of intervention of symptom presentation	5	45-	
Consistency of ASD-related behaviors through time, between raters, and across environments	5	90*	
Poor ability to acclimate and change behavior with familiarity	5	63	0-

Note: \*=Concept Earned Consensus - =Concept Eliminated

During *Scoping* and Round 1 analysis, one interesting finding was that participants tended to use the terms “odd,” “unusual,” or “atypical” to describe the behaviors of children with ASD, whereas the terms “delayed,” “poor,” or “limited” were used to describe the behaviors of children with all other conditions (with the exception of COS, where the terms odd and unusual were also used with greater frequency). During Round 2, participants were asked to describe how they knew an interaction with a child was odd, atypical, or unusual vs. limited or delayed. The responses of participants were coded and analyzed, and the following comparison table was generated. During Round 3, participants were asked to review the comparison table and provide suggestions for changes, but no feedback was offered. See *Figure 3* for the Comparison table.

<b>Odd/Unusual</b>	<b>Delayed/Limited</b>
Odd and unusual behaviors are those that are distinctive and that most people would think are strange. These behaviors do not fall within the typical developmental trajectory and are not seen at any stage of a child’s development. The quality of these behaviors feels overly formal,	Delayed and limited behaviors are those that would be typical of a younger child, are demonstrated inconsistently, and/or seem to be in the process of developing. One example might be how a tantrum is typical of a 2-year-

stilted, not coordinated with other modes of communication, and/or learned and rote rather than natural. Examples of oddities pertaining to speech quality may include different or unusual tone, prosody, fluidity, or repetitiveness.	old, but if seen in a 13-year-old, you might say there were delays in emotional regulation.
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Figure 3. Participant description of the difference between odd and delayed behaviors.

### **Rounds 1-3 Results: Differentiating ASD From Other Childhood Conditions**

The Round 1 questionnaire was developed to provide answers to research question 2 (*How do experts decide whether the aforementioned characteristics are attributed to ASD rather than to another condition?*) and research question 3 (*What sources of information do experts use to confirm or reject their clinical judgment in the process of diagnostic decision-making?*). This section will discuss the results for questions designed to answer research question 2. To answer research question 2, participants were asked to explore a range of conditions that represent IDEA categories and for which the literature suggests share multiple symptom terminology with ASD. Based on *Scoping* responses and a review of the literature, I determined that to best answer how one would decide which condition was the best fit for a child, one would have to understand which characteristics made the conditions “stick” together, and which pulled them apart. In other words, in order to determine if a child’s characteristics were in fact attributed to ASD, one would have to have knowledge of all the conditions that might mimic ASD in order to rule those out. The alternate conditions presented to the participants were: ID, ADHD, SLI, IG, Anxiety Disorders, Mood Disorders, COS, DTAs, SLD, and TBI. Participants were given three open-ended questions for each condition, hereby referred to as Round 1, Questions 1-3, a-j. Round 1, Question 1 asked, “*What features of (condition) might a novice evaluator mistake for symptoms of ASD?*” Round

1, Question 2 asked, “After receiving a referral for a child with suspected autism, What are examples of “red flags” that might cue you to suspect that (condition) might actually be the cause of the child’s symptoms?” The following definition of “red flags” was provided to participants prior to each question set.

*Those qualitative features noticed during an evaluation that trigger one’s clinical judgment to suspect that a condition might be the cause of a student’s symptoms. These “red flags” may be noticed during a record review, parent or teacher interview, assessment, or student observation, but are not the direct result of any formal assessment.*

During Round 2, participants were re-presented with the question sets along with the concepts that participants listed during their Round 1 responses, and percentages of respondents who listed each concept. All of the codes developed for Round 1 responses, even if only mentioned by one participant, were presented during Round 2. During Round 2, participants were asked to mark whether they agreed or disagreed with each concept. For concepts that reached Round 1 inclusionary consensus (defined by being mentioned in 78% or more of responses), participants were asked additional follow-up questions. In Round 3, participants were again presented with each question set and percentage of agreement, and again asked whether they agreed or disagreed with each concept. Following are the results of Round 1, Questions 1 and 2 for each condition as they progressed from the initial coding of Round 1 to the final consensus of Round 3.

**Differentiating ASD from ID.** When asked what symptoms of ID novice evaluators might confuse for ASD, participant responses yielded an initial 19 concepts. These concepts had initial percentage of response that ranged from five to 53. Nine

concepts earned final consensus after Round 3. Table 34 displays the initial 19 concepts developed during Round 1 and the process of exclusionary and inclusionary consensus that occurred in Rounds 2 and 3.

Table 34

*Round 1, Question 1a: Symptoms of ID that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Poor communication	93		
Poor social skills	53	100*	
Repetitive/self-stimulatory behaviors	40	90*	
Immature/delayed play	33	90*	
Global delays/immaturity	20	90*	
Limited range of interests	20	90*	
Poor attention/focus	13	81*	
Sensory processing issues	13	45-	
Communicative echolalia	6	63	29-
Delayed social responses	6	54	38-
Disinterest in learning	6	36-	
History of milestone delay	6	81*	
Limited gesture use	6	54	14-
May fail to respond to test items above intellectual level	6	54	29-
Perseveration	6	63	43-
Poor eye contact	6	45-	
Poor imitation	6	54	14-
Poor social judgment	6	81*	
Self-injury	6	54	38-

*Note: \* = Concept Earned Consensus - = Concept Eliminated*

Poor communication was a characteristic of ID that may be mistaken for ASD that 93% of participants listed in their Round 1 responses. In order to explore this potential symptom confusion further, participants were asked to respond to the following statement during Round 2: *Poor communication was listed by 93% of respondents and is "locked in" Please add any thoughts about how you would use clinical judgment to differentiate poor communication that occurs in intellectual disability from the poor*



communication that occurs in ASD. Participant responses were coded and analyzed in order to develop the following Comparison table. During Round 3, participants were asked to offer feedback or suggestions for change, but no suggestions were given. See *Figure 4* for the Comparison table.

Round 1, Question 2 asked participants to explore what “red flags” would lead them to suspect ID rather than ASD as the root of a child’s symptoms. Once coded and analyzed, Round 1, Question 2 responses led to the creation of 17 concepts. Of those 17 initial concepts, 15 reached final consensus in Round 3. Table 35 displays the initial 17 concepts and the process of reaching consensus for the final 15 concepts.

Poor Communication of ASD	Poor Communication of ID
Children with ASD have unusual patterns of communicative strengths and weaknesses. You might see patterns such as expressive language being stronger than receptive, or a strong expressive vocabulary with difficulty applying it flexible to social situations. There is generally a lack of nonverbal compensation for communicative difficulties. Finally, you would expect to see some sort of communicative atypicality such as odd use of words, stereotyped language, or odd tone and prosody.	Children with ID have delays in their communication, but are generally not atypical communicators. Their adaptive, cognitive, and language profiles may be even, and you likely won’t notice a significant strength in any of those areas. Children with ID will likely demonstrate skills that you would expect to be lacking in a child with ASD including use of and response to gestures, eye contact, and facial expression. There will usually be some effort to engage with others, even if nonverbally. An examiner might also notice that it is easy to get the child to respond to social interaction.

*Figure 4.* Participant description of the poor communication of ASD and ID.

Table 35

*Round 1, Question 2a: Characteristics That May Lead an Expert to Suspect ID Rather Than ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Evidence of cognitive delays in multiple areas either currently or in infancy	60	89*	
Child has social/play interest and reciprocity	60	89*	
Social/play abilities are matched to developmental level	60	100*	

Appropriate eye contact	20	78*	
Appropriate nonverbal communication skills	20	89*	
Lack of repetitive behaviors	20	78*	
Presence of a social smile	13	89*	
Slow rate of progress	13	78*	
Demonstrates empathy	6	89*	
Engages in joint attention	6	89*	
Engages in pretend play	6	89*	
Has a desire to please others	6	89*	
Initiates social interaction with others	6	78*	
Lack of ASD-specific speech features such as echolalia, repetitive speech, odd use of words/phrases	6	89*	
Poor academic engagement	6	55	29-
Responds to own name	6	67	29-
There is family history of learning/cognitive delays	6	89*	

Note: \* = Concept Earned Consensus - = Concept Eliminated

**Differentiating ASD from ADHD.** Round 1, Question 1 yielded an initial 15 concepts pertaining to characteristics of ADHD that novice evaluators might confuse for those of ASD. These concepts had initial percentage of response that ranged from six to 53. Nine concepts earned final consensus after Round 3. Table 36 displays the initial 15 concepts developed during Round 1 and the process of exclusionary and inclusionary consensus during Rounds 2 and 3 that led to the development of the final nine concepts.

Table 36

*Round 1, Question 1b: Symptoms of ADHD that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of concepts listed during Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Poor quality of social interactions and engagement	87*		
Poor eye contact due to inattention/hyperactivity	53	100*	
Perseveration/circumscribed/restricted interests	40	64	14-
Inattention may be confused for disengagement	33	90*	

Behavioral and emotional dysregulation	27	100*	
Difficulty maintaining back and forth on-topic conversation due to hyperactivity and inattention	20	82*	
Failure to respond to social cues due to distractibility and inattention	20	91*	
Hyperactivity and impulsivity	20	73	29-
Intrusive/poor boundaries	20	100*	
Hyperactivity/fidgeting mistaken for repetitive behaviors	13	91*	
Self-directed	13	55	14-
Sensory-seeking behaviors	13	73	57-
Peer rejection/withdrawal	6	73	71*
Poor executive functioning	6	73	57-
Poor nonverbal communication	6	64	29-
Poor perspective-taking	6	64	57-
Perseveration/restricted interests specific to video games only (new addition added in comments section of last questionnaire)		N/A	14-

Note: \* =Concept Earned Consensus - =Concept Eliminated

Poor quality of social interaction and engagement was a characteristic of ADHD that 87% of participants listed in their Round 1 responses as something that may be confused for a symptom of ASD. In order to explore this potential symptom confusion further, participants were asked to respond to the following statement during Round 2:

*Poor quality of social interactions and engagement was reported by 87% of respondents and is "locked in" (60% of respondents specifically stated that impulsive, disruptive, and hyperactive behaviors affect the quality of social interactions and engagement and 40% of respondents specifically stated that inattention and distractibility affect the quality of social interactions and engagement). Please add any thoughts about how you would use clinical judgment to differentiate poor social interaction and engagement that occurs in ADHD from the poor social interaction and engagement that occurs in ASD.*

Participant responses were coded and analyzed in order to develop the following Comparison table. During Round 3, participants were asked to offer feedback, but no feedback or suggestions were given. See *Figure 5* for the Comparison table.

Round 1, Question 2 led to the creation of 18 concepts, 15 of which reached final consensus in Round 3. This question asked participants to explore what “red flags” would guide their decision-making to suspect the root of a child’s symptoms might be attributed to ADHD rather than ASD. Table 37 displays the initial 19 concepts and the process of reaching consensus for the final 15 concepts.

<b>Poor Social Interaction and Engagement of ASD</b>	<b>Poor Social Interaction and Engagement of ADHD</b>
Children with ASD are generally difficult or awkward to connect with. Their responses feel odd or unusual, even if the interactions are highly structured and they are focused on the interactions. You are less likely to see a positive change in how natural an interaction feels with intervention. Things like empathy and understanding social nuances and cues are lacking, even when outside of a social situation.	Children with ADHD feel easier to connect with. For instance, even if they are moving all about the room and interactions are brief, there still might be friendly back-and-forth banter. They respond to others in a reciprocal way (when they are paying attention) and demonstrate empathy toward others. Children with ADHD may role-play appropriate social behavior well, but have difficulty demonstrating it in the moment. They understand social nuances in a 1:1 setting, but may miss cues in the moment. When they are highly motivated, you may see appropriate social interactions with peers.

*Figure 5.* Participant description of the poor social engagement of ASD and ID

Table 37

*Round 1, Question 2b: Characteristics That May Lead an Expert to Suspect ADHD Rather than ASD*

<u>Concept</u>	<u>% of Concepts listed during Round 1</u>	<u>Round 2 Agreement %</u>
Challenges with social play/reciprocity are context-dependent and can be linked to problems with inattention and hyperactivity	80*	
Desire/interest in social interactions, even if not always successful	33	78*
Challenges with communication that do exist are linked to hyperactivity/inattention	33	100*

Has social awareness and insight, even if he/she doesn't demonstrate them in the moment	27	89*
Has a variety of age-appropriate interests	20	89*
Appropriate social development reported in first year	13	89*
Does not demonstrate repetitive mannerisms	13	89*
Positive response to ADHD-specific interventions (may see increase in social appropriateness)	13	89*
Presence of age-appropriate pretend play	13	89*
Flexible with changes/changes in routine	13	78*
History supports ADHD diagnosis	13	100*
Impulsivity	6	67*
Intact eye contact		78*
Integrates verbal with nonverbal behaviors	6	89*
Overall behavioral pattern recognized as ADHD	6	89*
Presence of executive functioning concerns	6	44-
Sensory preferences without strong aversions	6	44-
Typical speech patterns (no echolalia, unusual prosody, repetitions, odd phrasing)	6	89*

Note: \* =Concept Earned Consensus - =Concept Eliminated

Challenges with social play/reciprocity that are context-dependent and can be linked to problems with inattention and hyperactivity was listed by 80% of participants in Round 1 as a red flag would trigger their thinking that ADHD rather than ASD was the root of a child's difficulties. In order to explore this potential differentiating factor further, participants were asked to respond to the following statement during Round 2:

*Challenges with social/play reciprocity are context-dependent and/or linked to problems with inattention and hyperactivity was listed by 80% of participants and is "locked in"*

*Please describe how you know when a child's challenges with social/play reciprocity are linked to problems with inattention and hyperactivity rather than to difficulties encountered by children with ASD.* Participant responses to this statement were coded and analyzed in order to develop the following comparison table. During Round 3,

participants were asked to review the table and offer feedback, but no further suggestions were given. See *Figure 6* for the Comparison table.

<b>Consistent challenges with social and play reciprocity of ASD</b>	<b>Context-Dependent challenges with social and play reciprocity of ADHD</b>
Children with ASD may be interested in interacting with peers. However, they have unusual or awkward social skills, even when they are focused, attentive, and interested in the interaction. Children with ASD may need play or social interactions to be the same every time and have difficulty dealing with novelty. Children with ASD may annoy peers, but it will be less other-focused/intentional, and more due to self-focused behaviors.	Children with ADHD have a desire and interest in interacting with others and will generally initiate social interactions with peers. These interactions may start off well, but the child with ADHD may drift off or engage in inappropriate behaviors after some time. These inappropriate behaviors such as interruptions or impulsivity may lead to peer rejection. Further, not focusing on the words or actions of others may lead to misunderstandings. Due to this rejection, children with ADHD may reach negatively, withdrawal, or try to intentionally get a “rise” out of a peer as a way of interacting.

*Figure 6.* Participant description of social and play reciprocity of ASD and ADH

**Differentiating ASD from SLI.** During Round 1, participants were asked what characteristics of SLI novice evaluators might confuse for ASD. Participant responses to this question yielded 18 initial concepts with an initial percentage of response that ranged from six to 67. Eight concepts earned final consensus after Round 3. Table 38 displays the initial 18 concepts developed during Round 1 and the process of exclusionary and inclusionary consensus that occurred in Rounds 2 and 3.

Table 38

*Round 1, Question 1c: Symptoms of SLI that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Expressive and receptive language delay	67	100*	
Poor conversation skills, including asking and answering questions	47	100*	
Reluctance to interact with others that develops after history of difficult communication	40	82*	

Imitative echolalia while learning new words	27	82*	
Difficulty following directions	20	82*	
Poor understanding of pragmatic language	20	82*	
Apraxia/nonverbal presentation	13	82*	
Poor eye contact	13	28-	
Reduced amount of vocalizations	13	91*	
Apparent delay in pretend play due to language difficulties	6	64	57-
Difficulty requesting	6	64	57-
Limited range of facial expressions	6	18-	
Moving adult's hand to show what they want mistaken for use of adult's hand as a tool	6	46-	
Poor articulation	6	46-	
Poor inference of thoughts and feelings	6	55	29-
Poor personal space	6	28-	
Stuttering	6	46-	
Use of jargon beyond age expectations	6	46-	

Note: \* = Concept Earned Consensus - = Concept Eliminated

Next, participants were asked to describe what “red flags” might cue them into suspecting SLI, rather than ASD was the root of a child’s difficulties. Round 1, Question 2 led to the creation of 10 initial concepts. Those concepts had an initial percentage of response ranging from six to 53. Of those 10 concepts, nine earned final consensus in Round 3. See Table 39 for a display of the initial concepts and process of earning consensus.

Table 39

*Round 1, Question 2c: Characteristics That May Lead an Expert to Suspect SLI Rather Than ASD*

<u>Concept and Initial Percentage of Participants who Listed Each Concept</u>	<u>% of Concepts Listed During Scoping</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Nonverbal compensation for language difficulties leads to relative strength in nonverbal communication	53	100*	
Has a variety of age-appropriate play/leisure interests	20	89*	
Language, even if limited, is social in nature	33	100*	

Shows interest in interacting with others	33	89*	
Language, even if limited, is not characterized by echolalia, repetitive speech, odd use of words and phrases, or pronoun errors	13	89*	
Maintains eye contact	13	89*	
No restricted or repetitive behaviors	13	89*	
In infancy, demonstrated typical babbling, pointing, facial expressions, eye contact	6	77	38-
Demonstrates appropriate theory of mind	6	89*	
Is flexible/not rigid	6	89*	

Note: \* =Concept Earned Consensus - =Concept Eliminated

**Differentiating ASD from IG.** After coding and analysis, Round 1, Question 1 yielded an initial 15 concepts pertaining to characteristics of IG that novice evaluators might confuse for those of ASD. These concepts had initial percentage of response that ranged from seven to 43. Nine concepts earned final consensus after Round 3. Table 40 displays the initial 15 concepts developed during Round 1 and the process of exclusionary and inclusionary consensus during Rounds 2 and 3 that led to the development of the final nine concepts.

Table 40

*Round 1, Question 1d: Symptoms of IG that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Intense and perseverative interests (may be advanced for age)	93*		
Formal/Pedantic language	43	100*	
Prefer to engage with adults/older children	43	100*	
Appearance of social awkwardness	29	91*	
Advanced vocabulary use may seem scripted or stereotyped	21	91*	
Difficulty relating to same-aged peers (may lead to rejection/withdrawal)	21	100*	
Ability to hyperfocus on areas of interest	14	91*	



Precocious reading/hyperlexia	14	73	86*
Uneven cognitive profile/splinter skills	14	64	43-
Difficulty shifting attention from areas of interest	7	64	8-
Disengagement in class	7	73	57-
One-sided conversations	7	73	57-
Perfectionism	7	82*	
Poor eye contact	7	36-	
Precocious math	7	64	11-
Strong memory	7	73	71*

Note: \* =Concept Earned Consensus - =Concept Eliminated

Intense and perseverative interests that may be unusually advanced for one's age was listed by 93% of participants in Round 1 as a characteristic of IG that may be mistaken for one of ASD. In order to further explore this shared characteristic, participants were asked to respond to the following statement during Round 2: *Intense and perseverative areas of interest that may be unusually advanced for age was listed by 93% of participants and is "locked in" Please add any thoughts about how you would use clinical judgment to differentiate intense/perseverative interests that occur in intellectual giftedness from intense/perseverative interests that occur in ASD.* Participant responses to this statement were coded and analyzed in order to develop the following comparison table. During Round 3, participants were asked to offer feedback on this table, but no further suggestions were given. See *Figure 7* for the comparison table.

Next, participants were asked to list "red flags" that would lead them to suspect that IG, instead of ASD was at the root of a child's symptom presentation. Round 1, Question 2 led to the creation of 17 initial concepts with response rates ranging from seven to 75. Of these initial 17 concepts, 14 earned final consensus (see Table 41).

<b>Intense and Perseverative Interests of ASD</b>	<b>Intense and Perseverative Interests of IG</b>
<p>The intense and perseverative interests that occur in children with ASD can lead to adaptive and social impairment. Children with ASD tend to recite facts about their interests, and these interests do not tend to evolve over time. Further, children with ASD may have a more difficult time fitting their interests into a larger context of knowledge and will likely not ask others thoughtful questions about their interests. These interests may seem unusual for the child's developmental level, or in an area in which others have little interest.</p>	<p>The intense and perseverative interests that may occur in children with IG do not lead to adaptive or social impairments. They may ask others thoughtful questions about their areas of interest, or seek out experts in the field to befriend. Children with IG can and do show interest in other topics and can switch their interest off if it is interfering with social connections. The interests of children with IG tend to involve a greater depth of comprehension and they can fit these interests into a larger context of knowledge. These interests tend to evolve over time.</p>

Figure 7. Participant description of intense and perseverative interests of ASD and IG.

Table 41

Round 1, Question 2d: Characteristics That May Lead an Expert to Suspect IG Rather Than ASD

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Intact social skills and reciprocity (33 % specified with adults)	75	89*	
Interested in interaction with peers; particularly those of similar intellectual ability	67	78*	
Has social insight/theory of mind	42	89*	
Does not demonstrate repetitive motor behaviors	33	78*	
Prefers certain topics, but can be easily drawn into other's interests	33	89*	
Overall comprehension and insight are on par with decoding and math facts, rather than skill scatter	33	67	29-
Uses appropriate pragmatic language and refrains from listing facts, even when conversing about areas of strong interest	33	100*	
Integration of verbal and nonverbal communication including eye contact	25	89*	
Early history is typical for play, reciprocity, and joint attention	17	89*	
Extremely high IQ	17	89*	
Behavioral issues exist only in select settings	7	44-	

Has strong interests and attempts to share them socially with others	7	78*	
Has typical speech patterns (no echolalia, odd use of words/phrases, etc.)	7	78*	
High rate of academic skill acquisition	7	89*	
Interests evolve over time (as opposed to being “stuck” on unusual details)	7	89*	
Is flexible/not rigid	7	78*	
No sensory issues	7	67	29-

Note: \* =Concept Earned Consensus - =Concept Eliminated.

**Differentiating ASD from anxiety disorders.** Round 1, Question 1e asked participants to discuss what features of anxiety disorders a novice evaluator might mistake for characteristics of ASD. Participant responses to this question yielded an initial 18 concepts, ranging from seven to 79 of respondents who listed each concept. After Round 3, 12 concepts reached final consensus. See Table 42.

Participants were also asked to consider which “red flags” would cue them into thinking that an anxiety disorder, rather than ASD was at the root of a child’s difficulties. In Round 1, participant responses yielded 22 initial concepts, ranging from seven to 64% of participants who listed each in their responses. After Round 3, 10 concepts reached final consensus. See Table 43 for the initial concepts and process of obtaining consensus.

Table 42  
*Round 1, Question 1e: Symptoms of Anxiety Disorders that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Avoidance of social situations/withdrawal/solitary play	79	100*	
Repetitive behaviors or fidgeting in response to anxiety and/or compulsions may be mistaken for self-stimulatory/restricted and repetitive behavior	57	91*	

Difficulty forming relationships/friendships	36	100*	
Reduced nonverbal communication/eye contact in unfamiliar situations	36	91*	
Reduced verbal communication in unfamiliar situations	36	100*	
Rigidity/insistence on things going a certain way	36	91*	
Poor behavioral/emotional regulation in response to normal situations	36	91*	
Perseverative/repetitive questioning/conversations	21	82*	
Preference for sameness and routine/poor response to change	21	91*	
Anxiety	14	82*	
Circumscribed/limited range of interests that may or may not be unusual in nature	14	64	12-
Avoidance of anxiety-producing situations	7	73	43-
Difference in presentation across settings	7	55	0-
Fears that may be mistaken for sensory defensiveness	7	64	57-
Overly concerned with order during play	7	82*	
Poor concentration	7	46-	
Poor sleep	7	64	29-
Social awkwardness	7	82*	

Note: \* = Concept Earned Consensus - = Concept Eliminated

Table 43

Round 1, Question 2e: Characteristics That May Lead an Expert to Suspect an Anxiety Disorder Rather Than ASD

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Improvement in verbal and nonverbal social communication and play with familiarity	64	100*	
Interest in and awareness of others' thoughts and feelings, sometimes to the point of being hyper-aware or afraid of others' judgment	43	89*	
Typical development in infancy and early childhood/can link onset of social difficulties to onset of anxiety	29	100*	
Shows intact receptive language skills	21	89*	

There is a ruminative quality to fears and worries	21	67	29-
Difficulty with social interaction exists in the absence of restricted and repetitive behaviors, echolalia, or idiosyncratic language	14	89*	
Repetitive behavior is a response to anxiety, rather than self-reinforcing	14	89*	
Adaptive skills are intact with the exception of social interaction	7	67	43-
Demonstrates good abstract thought	7	78*	
Has a variety of interests	7	67	29-
Has an intact sensory system	7	33-	
Has limited verbalizations	7	22-	
Is empathetic and/or overly apologetic	7	100*	
Intact play and leisure skills	7	67	43-
Poor eye contact	7	33-	
Poor functional communication	7	11-	
Poor social skills	7	22-	
Repetitive behaviors	7	22-	
Shows a desire to please others	7	67	43-
Social withdrawal	7	33-	
Shows insight into own thoughts and feelings about anxiety behaviors	7	100*	
Social and communicative abilities improve with treatments for anxiety	7	89*	

Note: \* =Concept Earned Consensus - =Concept Eliminated

**Differentiating ASD from mood disorders.** When asked what characteristics of mood disorders novice evaluators might confuse for ASD, participant responses yielded an initial 16 concepts. These concepts had initial percentage of response that ranged from seven to 71. Eight of the initial 16 concepts earned final consensus after Round 3. Table 44 displays the initial 16 concepts developed during Round 1 and the process of exclusionary and inclusionary consensus that occurred in Rounds 2 and 3.

Round 1, Question 2f question asked participants to explore what “red flags” would lead them to suspect the root of a child’s symptoms might be attributed to a mood

disorder rather than ASD. The responses to this question led to the creation of 16 concepts, eight of which reached final consensus in Round 3. From eight to 54% of participants listed each initial concept. Table 45 displays the initial 16 concepts and the process of reaching consensus for the final nine concepts.

Table 44

*Round 1, Question 1f: Symptoms of Mood Disorders that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Demonstrates poor emotional and behavioral regulation	71	100*	
Lack of interest in social activities/connections (may lead to withdrawal and isolation)	71	100*	
Limited/poor verbal and nonverbal social response to others	43	91*	
Poor eye contact	29	91*	
Flattened affect	21	91*	
Difficulty sleeping/eating	14	82*	
Inattention	14	64	14-
Limited interest in play and social activities, which may look like restricted interests	14	73	57-
Poor social skills	14	91*	
Social disinhibition may look like unusual social overtures (bipolar disorder specific)	14	64	57-
Difficulty attending to thoughts and interests of others/may only discuss own interests	7	64	29-
Difficulty with transitions and schedule changes	7	81*	
Odd communication patterns (bipolar disorder specific)	7	64	29-
Repetitive thoughts/conversation	7	64	43-
Similar family history to ASD	7	27-	
Similar medication regime to ASD	7	46-	

*Note: \* = Concept Earned Consensus - = Concept Eliminated*

Table 45

*Round 1, Question 2f: Characteristics That May Lead an Expert to Suspect a Mood Disorder Rather Than ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Early history negative for social communication challenges and restricted and repetitive behaviors	54	80*	
Has social insight and ability, but mood and behaviors interfere with interactions	31	90*	
Intact expressive/receptive language skills	31	70	14-
Intact nonverbal communication skills	31	90*	
Family history of mood disorder	23	100*	
Social/communicative difficulties linked to onset of mood/behavior challenges	23	100*	
Clear changes in mood/behavior (may have no identifiable trigger)	15	67	71*
Positive changes in social interaction and mood in response to interventions for mood disorder	15	89*	
Presentation may be inconsistent across settings	15	89*	
Child has a history of a difficult temperament	8	33-	
Child has control over emotional dysregulation	8	56	0-
Complains or seems bothered by lack of friendships	8	44-	
Content of social communication okay, but may have slowed, agitated, or impulsive responses to others	8	78*	
Does not demonstrate self-stimulatory behaviors	8	56	14-
Intact theory of mind	8	56	38-
Typical cognitive profile	8	56	14-

*Note: \* = Concept Earned Consensus - = Concept Eliminated*

**Differentiating ASD from COS.** During Round 1, Question 1g, participants were asked to reflect on what characteristics of COS a novice evaluator might confuse for ASD. Once coded and analyzed, responses to this question yielded 20 initial concepts.

Each concept was listed by eight to 58% of respondents. At the conclusion of Round 3, 15 concepts had reached final consensus. Please refer to Table 46 for more information.

Table 46

*Round 1, Question 1g: Symptoms of COS that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Odd, unusual, and/or repetitive speech patterns may appear like echolalia, scripting, or stereotyped language/neologisms, (8% specified these behaviors may stem from hallucinations)	50	100*	
Odd, unusual, and/or repetitive mannerisms	50	91*	
Poor social interaction, may have an odd or unusual quality	50	100*	
Poor behavioral/emotional regulation	42	100*	
Social withdrawal	42	100*	
Appear to be in own world	33	100*	
Restricted/perseverative interests	25	82*	
Poor eye contact	17	91*	
Disrupted social relationships	8	91*	
Flat affect	8	100*	
Language delay	8	64	29-
Overall skill regression (including language and social skills)	8	73	38-
Poor adaptive skills	8	73	14-
Poor play skills	8	55	38-
Poor social judgment	8	91*	
Psychotic thought processes	8	82*	
Reduced nonverbal communication	8	73	14-
Reduced verbal communication	8	82*	
Sleeping and eating disturbance	8	82*	
Unusual interests	8	82*	

*Note: \* =Concept Earned Consensus - =Concept Eliminated.*

Participants were also asked to describe what “red flags” might alert them into thinking that COS, rather than ASD might be the cause of a child’s difficulties. Once coded and analyzed, responses to this question yielded 15 initial concepts. Each concept was listed by 8 to 58% of respondents. At the conclusion of Round 3, six concepts



reached final consensus. Please refer to Table 47 for information regarding the initial concepts and process of obtaining consensus.

Table 47

*Round 1, Question 2g: Characteristics That May Lead an Expert to Suspect COS Rather Than ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Evidence of visual or auditory hallucinations	58	100*	
Early developmental history lacks indicators of ASD with late onset skill regression	50	80*	
Family history of mental illness/schizophrenia	25	90*	
May appear to be in own world, but can describe irrational/delusional/racing thoughts that are occurring	17	80*	
Behavioral patterns may be difficult to distinguish at first, but evolve over time to be more evident of schizophrenia	8	80*	
Compulsions, rituals, and repetitive behaviors may come and go	8	60	29-
Erratic/inconsistent patterns of social interaction and engagement - may swing from appearing typical to appearing highly unusual	8	80*	
Intact language	8	50-	
Intact nonverbal communication skills	8	60	29-
Poor social engagement paired with good social understanding	8	60	29-
Poor socialization	8	20-	
Prefers to be alone	8	20-	
Presence of imaginary play	8	60	14-
Quality of social interaction is different than observed in ASD	8	60	29-
Violent outbursts with no identifiable trigger	8	40-	

*Note: \* =Concept Earned Consensus - =Concept Eliminated.*

**Differentiating ASD from DTAs.** When asked what characteristics of DTAs novice evaluators might confuse for ASD, participant responses yielded an initial 23

concepts. These concepts had initial percentage of response that ranged from eight to 54. Fifteen of the initial 16 concepts earned final consensus after Round 3. Table 48 displays the initial 23 concepts developed during Round 1 and the process of exclusionary and inclusionary consensus that occurred in Rounds 2 and 3.

Table 48

*Round 1, Question 1h: Symptoms of DTAs that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Behavioral/Emotional Dysregulation	54	100*	
Detached from people and/or the environment	54	100*	
Poor/inappropriate/one-sided social interactions	54	91*	
Limited/poor language and communication	31	82*	
Poor eye contact	31	91*	
Rigidity	31	91*	
Difficulty forming friendships and relationships	23	100*	
Fears/Anxiety	23	91*	
Socially indiscriminate behavior	23	73	38-
Lack of empathy	15	91*	
Restricted and repetitive interests/play	15	55	
Developmental regression	8	64	
Executive Dysfunction	8	73	29-
Flattened affect	8	82*	
Heightened pain threshold	8	73	29-
Inappropriate responses to common situations	8	82*	
Poor perspective taking	8	82*	
Poor understanding and expression of emotion	8	73	71*
Reduced nonverbal communication	8	37-	
Reliance on routine	8	91*	
Self-stimulatory behaviors	8	73	57-
Sleep disturbance	8	73	38-
Tactile defensiveness	8	91*	

Note: \* = Concept Earned Consensus - = Concept Eliminated

Participants were also asked to consider what would lead them to decide that a DTA, rather than ASD was at the root of a child's difficulties. In Round 1, participant responses yielded 13 initial concepts, ranging from eight to 75 percent of participants who listed each in their responses. After Round 3, five concepts reached final consensus. See Table 49 for the initial concepts and process of obtaining consensus.

Table 49

*Round 1, Question 1h: Symptoms of DTAs that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
History positive for trauma/disrupted attachment	75	100*	
Inconsistent pattern of avoiding and seeking out interactions with others (push/pull interactions)	33	80*	
Positive response to treatment for trauma/attachment	25	90*	
Emotional and behavioral outbursts	17	30-	
History of parental mental health concerns	17	60	14-
Symptoms became evident after a trauma	17	100*	
Demonstrates situational fears	8	70	57-
Inconsistent patterns of avoiding/engaging with environment	8	60	38-
Intact functioning in certain areas	8	50-	
Lack of atypical development in certain areas	8	70	14-
Reduced joint attention and social engagement	8	20-	
Reenacts trauma through play	8	100*	
Weak history of restricted and repetitive behaviors	8	70	14-

*Note: \* =Concept Earned Consensus - =Concept Eliminated.*

**Differentiating ASD from SLD.** Next, participants were asked what symptoms of SLD, including NVLD, that novice evaluators might mistake for those of ASD. Initial responses led to the creation of 15 concepts linked to SLD symptomology, ranging in

percentage of response from nine to 37. Two additional concepts emerged that were not linked to characteristics of SLD. One of these additional concepts, listed by 18% of participants in Round 1, was tied to participant belief that ASD and SLD were not difficult to differentiate from one another. The second additional concept was listed by 28% of Round 1 participants and regarded participant disagreement that NVLD was an actual or true disability that was distinct from ASD. Both of these concepts were eliminated in Round 2 with only 27% agreement among participants. Of the remaining 15 initial concepts linked to SLD characteristics, seven earned final consensus after Round 3. Please refer to Table 50 for more information.

Table 50

*Round 1, Question 1i: Symptoms of SLD that may be Mistaken for Those of ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
<b>Concepts Linked to SLD Characteristics</b>			
Language Deficits (in language-based learning disabilities)	37	100*	
Learning/Academic/School problems	28	91*	
Poor use and understanding of nonverbal communication	18	45-	
Deficits in visual-spatial reasoning	18	64	14-
Poor abstract reasoning	18	91*	
Social skill deficits	18	37-	
Anxiety	9	82*	
Inattention	9	82*	
Inconsistent eye contact	9	36-	
Noncompliance	9	64	29-
Poor perspective taking	9	55	14-
Poor visual-motor skills	9	73	29-
Slow auditory processing speed	9	82*	
Social withdrawal	9	45-	
Unusual Learning Profile	9	82*	
<b>Other Concepts</b>			

There is no evidence that Nonverbal Learning Disability is a true disability	28	27-
There are no/very few similarities between SLD and ASD	18	27-

Note: \* =Concept Earned Consensus - =Concept Eliminated.

When asked which “red flags” may ignite their clinical judgment to suspect SLD instead of ASD, participant responses yielded 20 initial concepts, ranging from nine to 37% in response rate. Of these 20 concepts, eight earned final consensus after Round 3. Table 51 provides the initial concepts and process of earning consensus for Round 1, Question 2i.

Table 51  
Round 1, Question 2i: Characteristics That May Lead an Expert to Suspect a SLD Rather Than ASD

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
Intact verbal communication	37	60	
No restricted/repetitive behaviors or stereotypies	37	80*	
Intact social communication	28	80*	
No indicators of ASD either currently or in history	28	80*	
Patterns of cognitive and academic performance match those observed in SLD	28	100*	
Appropriate play skills	18	70	57-
Intact nonverbal communication	18	70	86*
Response to intervention	18	40-	
Deficits are not consistent across settings	9	60	14-
Can learn through imitation and observation (except in areas related to SLD)	9	70	43-
Documented history of academic challenges	9	80*	
Has appropriate social interests and awareness	9	80*	
Has a desire to please others	9	60	43-
Intact functioning in some areas, lack of atypical functioning in others	9	50-	
Lack of ASD-specific speech patterns such as echolalia, repetitive speech, odd use of words/phrases	9	70	71*

Intact language combined with poor nonverbal conversation skills	9	30-	
Intact theory of mind	9	70	43-
Intact social reciprocity	9	80*	
Is flexible and not attached to routines	9	70	43-
Poor perspective taking and abstract reasoning in the absence of restricted and repetitive behaviors, and play/communication challenges	9	30-	

Note: \* =Concept Earned Consensus - =Concept Eliminated.

**Differentiating ASD from TBI.** The final disability category that participants were asked to consider was TBI. When asked in which ways novice evaluators may mistake characteristics of TBI for those of ASD, participant responses yielded 13 concepts, ranging from eight to 42% in response rate. Twenty five percent of Round 1, Question 1j responses mentioned that TBI does not have a classic profile, and any number of symptoms may be or not be present. One respondent said, “I think TBI is such a broad category that there may not be one classic profile for TBI behaviors/symptoms” and another said, “Depending on the location of the brain injury, any number of systems might be impacted and therefore, any number of overlapping symptoms might be seen”. In Round 2, 91% of participants agreed with the following statement, “TBI does not have one classic profile/any number of symptoms may be present”. Another 82% of participants agreed with the statement, “Unusual profiles in any/all areas of development (motor, cognitive, speech, learning, social, behavior)”. Because both of the above statements were met with such strong agreement rates, I determined that TBI would be a difficult category to fully explore as a differential condition for ASD within the confines of this study.

Round 1, Question 2j asked participants what “red flags” would lead them into suspecting that TBI may be at the root of a child’s difficulties. Eighty three percent of participants responded that a documented history of TBI with evidence of typical development prior would be the biggest indicator that TBI, rather than ASD was the root of a child’s challenges. Participant responses led to the development of seven additional concepts, each ranging from an eight to 17% response rate. None of these seven concepts reached inclusionary consensus after Round 2, and four reached exclusionary consensus.

Overall, as a result of participant agreement that the category of TBI was too broad as well as a low number of potential differentiating characteristics that reached consensus, TBI was removed as a category and not explored after Round 2. See Tables 52 and 53 for the results of Rounds 1 and 2 questioning.

Table 52

*Round 1, Question 1j: Symptoms of TBI that may be Mistaken for ASD*

<u>Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 % Agreement</u>
Poor social skills/social judgment	42	100
Impulsivity	33	82
Attention difficulties	25	82
Emotional lability	25	91
Global delays	25	82
Speech/Language Delay	25	100
TBI does not have one classic profile/any number of symptoms may be present	25	91
Poor executive functioning	17	82
Poor skill generalization	8	82
Sensory processing dysfunction	8	82
Skill regression	8	82
Social disinhibition	8	73
Unusual profiles in any/all areas of development (motor, cognitive, speech, learning, social, behavior)	8	82

Overall, the results of Round 1, Questions 1 and 2 led to the creation of several concepts pertaining to characteristics linked to several childhood conditions that experts cue into during the evaluation process. These characteristics form constellations that may lead expert evaluators toward or away from suspecting that a child has ASD or another condition. Once an expert has a suspicion one way or another, a next step in the

Table 53

*Round 1, Question 2j: Characteristics That May Lead an Expert to Suspect TBI Rather Than ASD*

<u>Concept</u>	<u>% of Concepts Listed During Scoping</u>	<u>Round 2 % Agreement</u>
History positive for TBI with evidence of typical development prior	83	
Atypical patterns of learning acquisition (plateaus and regressions)	17	50
Intact social relationships	8	70
Intact speech and language skills	8	60
Memory and attention challenges	8	50
Sensory differences linked to too much input, rather than over-interest	8	30
Social immaturity	8	30
Symptoms of ASD lack consistency	8	60

evaluation process is to confirm or disprove their initial suspicions in order to make a diagnosis or determination of eligibility.

### **Rounds 1-3 Results: Confirming or Disproving One's Clinical Judgment**

The next set of questions presented to participants in Rounds 1 through 3 were designed to answer Research Question 3: *What sources of information do experts use to confirm or reject their clinical judgment in the process of diagnostic decision-making?* In Round 1, participants were asked what characteristics of (condition) would lead them



away from suspecting an ASD diagnosis and toward suspecting the alternate condition. Following, they were asked, “How would you confirm or rule out those suspicions?” The responses pertaining to each condition were analyzed separately and as a whole. Concepts that appeared in at least 40% of participant responses for each of the alternate conditions were considered common themes. These concepts were pulled out and grouped under the category, “*Experts Recommend the Following Occur in All Evaluations Where One is Attempting to Differentiate Between ASD and Another Condition*”. Concepts that did not appear in at least 40% of participant responses for each condition were analyzed as specific to each condition for which they appeared. Participant responses in Round 1 led to the creation of three concepts under the common themes category. All three concepts reached final consensus in Round 2. Round 1 responses also led to the creation of between six and 15 initial concepts for each of the 10 alternate conditions. This total of 95 concepts were narrowed down to 64 that reached final consensus after Round 3. Table 54 displays the initial concepts developed during Round 1 and process of reaching inclusionary and exclusionary consensus through Round 3.

### **Supplementary Analysis**

To examine both between-group differences and trends that arose within overall participant responses, supplementary analyses were conducted. First, all Round 2 concepts that had split consensus, as defined as a 40-60% agreement rate, were examined to determine if this split was group-specific. Second, the concepts that reached final consensus for all nine differential conditions were analyzed for trends suggesting a

particular expert focus for each condition. The results of the supplementary analyses are discussed below.

**Group differences.** There were two distinct groups of psychologists who took part in this study: psychologists who practice primarily in a clinical, hospital, or university setting (hereby referred to as clinical psychologists) and psychologists who practice primarily in a public PreK-12 school setting (hereby referred to as school psychologists). During Round 2, there were seven clinical psychologist and six school psychologist respondents. In order to determine whether one's scope of practice was linked to whether they agreed or disagreed with a concept, I examined the response patterns for all Round 2 questions that earned a 40-60% agreement rate. Table 55 lists the Round 2 concepts that had clear differences between school and clinical psychologists, as well as the percentage of school and clinical psychologists who agreed with each. Clear between-group differences were defined as a difference of 25 or more percentage points between groups.

**Trends by condition.** A second supplementary analysis was conducted to examine any areas of particular focus found in shared and differentiating characteristics that reached consensus for each alternate condition. Table 56 displays all results found in this supplementary analysis.

Table 54

Round 1, Question 3a-j: How do Experts Confirm or Rule out Their Suspicions?

<u>Concept and Initial Percentage of Participants who Listed Each Concept</u>	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
<b>Common Themes</b>			
Administer ADOS-2, ADI-R, or other ASD-Specific measures	43	90*	
Investigate medical, family, educational, developmental history through parent and teacher interview and record review	69	100*	
Observe in multiple environments	58	90*	
<b>Concepts Specific to Each Alternate Condition</b>			
<b>ID</b>			
Adaptive assessment	53	100*	
Play-based assessment/observations	20	78*	
Pragmatic assessment	13	55	83*
Consider ID as a comorbid condition to ASD	13	100*	
Compare cognitive levels to social/adaptive levels	6	100*	
Complete a developmental profile	6	78*	
Look for even vs. uneven profiles during adaptive assessment	6	78*	
Look for even vs. uneven profiles during cognitive assessment	6	78*	
Social skill assessment	6	55	83*
<b>ADHD</b>			
Standardized assessments to look for elevated scores in hyperactivity, impulsivity, and inattention	67	89*	
Executive functioning assessments	13	89*	
Interact with the child to get a feel for the quality of social deficits	13	100*	
Treat for ADHD/increase structure and examine the child's response to these interventions	13	78*	
Administer a cognitive assessment	7	67	33-
Administer an adaptive assessment	7	56	67-
Conduct a language sample	7	44-	
Conduct a play assessment	7	44-	

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Concept and Initial Percentage of Participants who Listed Each Concept

	<u>% of Concepts Listed During Round 1</u>	<u>Round 2 Agreement %</u>	<u>Round 3 Agreement %</u>
<b>SLI</b>			
Conduct speech/language/pragmatic testing	53	100*	
Observe during ADOS-2 or in natural environments to look for compensation for delayed speech using other means	20	89*	
Observe/assess play, including alone, with familiar caregiver, and with examiner	13	89*	
Assess cognitive skills to see if other areas are affected	7	78*	
During observations, look for eye contact, emotional responsiveness, joint attention, self-stimulatory behaviors	7	89*	
During parent interview, ask specifically about social interest and social behaviors during activities where language is not a hindrance	7	100*	
Conduct or review an occupational therapy evaluation	7	22-	
<b>IG</b>			
Conduct an IQ/Cognitive assessment to confirm giftedness	71	100*	
Conduct an academic assessment	13	89*	
Conduct or review a Speech/Language/pragmatic assessments	13	56	57-
During observations, focus on quality of interactions with familiar, and unfamiliar adults	7	89*	
During observations, focus on quality of social interactions with peers	7	67	67-
During observations, focus on whether or not the child attempts to share his or her strong interests socially	7	78*	
During observations, focus on whether or not the child can pick up on subtle social cues	7	78*	
During observations, focus on whether or not the child is able to shift topics to someone else's interests	7	89*	
During record review, focus on report cards	7	44-	
During record review, focus on the context during which social or behavioral concerns first developed	7	78*	
Look for inconsistency of social skills/behaviors across settings	7	67	57-
Observe during peer interactions with gifted peers if possible	7	78*	
Conduct a play assessment	7	44-	
Conduct standardized social-emotional assessments	7	67	33-
Use clinical judgment to assess the quality of social deficits	7	78*	

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Concept and Initial Percentage of Participants who Listed Each Concept

	<u>% of Concepts Listed During Round 1</u>	<u>% Agreement in Round 2</u>	<u>% Agreement in Round 3</u>
<b>Anxiety Disorders</b>			
Administer standardized interviews/rating scales to look for elevated anxiety symptoms	33	89*	
Observe child interacting with parent/caregiver and in very familiar settings (through 2-way mirror if possible) to see if there are changes in communication and social interaction	13	56	33-
During parent interview, focus on social interactions at home and with familiar people	7	100*	
Focus on examining the consistency of symptoms across environments	7	89*	
Interview the child	7	89*	
Look carefully at sensory-related behaviors to determine if they are actually fear/compulsion-based rather than a true sensory aversion	7	78*	
Conduct a play assessment	7	89*	
Conduct or review a speech/language assessment	7	56	57-
Take time to get to know the child for more accurate results	7	100*	
<b>Mood Disorders</b>			
Conduct standardized assessment of mood and behavior	36	89*	
During interviews, record review, and observation look for development of mood symptoms over time	7	100*	
During observations, focus on interactions, play, and emotional regulation	7	89*	
During record review, focus on past treatment notes and look for evidence of clear mood episodes	7	100*	
Conduct peer comparisons	7	44-	
Conduct a student interview	7	89*	

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Concept and Initial Percentage of Participants who Listed Each Concept

	<u>% of Concepts Listed During Round 1</u>	<u>% Agreement in Round 2</u>	<u>% Agreement in Round 3</u>
<b>COS</b>			
Follow the child over time to differentiate, as early differentiation may not be possible	20	89*	
Carefully examine and research the side-effects of any medications the child is on for possible contributions to hallucinations or delusions	14	100*	
Consult with/refer to a psychiatrist/neurologist/specialist	14	100*	
Examine any previous medical/genetics testing	14	89*	
Standardized/direct assessment of psychosis/mental status	14	100*	
Assess language skills	7	55	57-
During evaluation and observation, focus on fluctuations in play, behavior, and social interactions	7	89*	
During history interviews, focus on family mental health	7	100*	
During parent interview, focus on course and timing of symptoms, as later onset of symptoms would be more indicative of schizophrenia	7	100*	
Interview with child with a focus on separating hallucinations/delusions from perseverative interests	7	89*	
Conduct a play assessment	7	67	57-
Rule out seizures	7	55	17-
<b>DTAs</b>			
Focus on confirming presence of trauma/neglect during record review and interviews	42	100*	
Focus on examining the nature and severity of the trauma during record review and interviews	8	100*	
Focus on responsiveness to a stable/nurturing environment	17	89*	
Play assessment	17	100*	
Student interview	17	89*	
During observations and interviews, focus on approach/avoidant behaviors in a variety of social contexts	8	89*	
Examine the constellation of behaviors	8	100*	
Examine the timeline of when the behaviors first occurred	8	100*	
Focus on parental mental health during interviews and record review	8	67	
Use formal screening tools for trauma symptoms	8	78*	
Conduct interviews with therapists	8	78*	

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	Conduct peer comparisons	8	55	57-
	Conduct or review speech/language assessments	8	44-	
	Use clinical judgment	8	67	100*
	<b>SLD</b>			
	Conduct academic and cognitive testing	83*		
	Conduct or review language testing	18	50-	
	Assess executive functioning	9	50-	
	Examine school records	9	100*	
	Integrate findings of cognitive strengths and weaknesses, social skills/insight, and general behavior to determine if there are patterns of atypical behavior	9	100*	
	Look at progress monitoring of academic skill development over time	9	90*	
	Neuropsychological testing	9	50-	
	Peer comparisons	9	50-	
	While reviewing assessment results, focus on cognitive strengths and weaknesses	9	80*	
	<b>TBI</b>			
	Review medical records to confirm presence and severity of TBI	33	100*	
	During record review and interview, focus on functioning prior to the brain injury	25	100*	
	Neuropsychological assessment	8	80*	
	Conduct a play assessment	8	30-	
	Refer to/consult with a neurologist	8	90*	
	Research the nature and location of the TBI to see if the affected areas might account for current concerns	8	100*	
	Conduct or review a speech/language assessment	8	70	N/A

Note: \* =Concept Earned Consensus - =Concept Eliminated

Table 55  
*Between-Group Analysis*

<u>Concept That Earned 40-60 Agreement in Round 2</u>	<u>School Psychologist Agreement</u>	<u>Clinical Psychologist Agreement</u>
<b>Characteristics of ASD important for differentiation</b>		
Atypical eye contact	40	66
Consider continuum of symptoms within ASD severity and age	100	50
Consider impact of intervention on symptom presentation	66	20
Atypical patterns of strengths and weaknesses in cognitive profile	40	66
<b>Traits that novices might confuse for ASD</b>		
<i>ID</i> : Perseveration	80	50
<i>ID</i> : Delayed responses	40	66
<i>ID</i> : Limited gesture use	40	66
<i>ID</i> : May fail to respond to test items	40	66
<i>ID</i> : Poor eye contact	60	33
<i>ID</i> : Self injury	40	66
<i>ID</i> : Poor imitation	40	66
<i>SLI</i> : Use of jargon beyond age expectations	80	50
<i>Anxiety Disorders</i> : Difference in presentation across settings	40	66
<i>Mood Disorders</i> : Similar medication regime to ASD	33	60
<i>DTAs</i> : Restricted and repetitive interests/play	40	66
<i>SLD</i> : Social Withdrawal	33	60
<b>“Red flags” that cue expert to suspect alternate condition</b>		
<i>ADHD</i> : Presence of executive functioning concerns	25	60
<i>ADHD</i> : Sensory preferences without strong aversions	80	0
<i>IG</i> : Behavioral issues exist only in select settings	60	25
<i>Mood Disorders</i> : Does not demonstrate self-stimulatory behaviors	40	70
<i>Mood Disorders</i> : Intact theory of mind	40	70
<i>Mood Disorders</i> : Typical cognitive profile	40	70
<i>COS</i> : Compulsions, rituals, and repetitive behaviors may come and go	80	40
<i>COS</i> : Poor social engagement paired with good social understanding	80	40



<i>DTAs</i> : Inconsistent patterns of avoiding/engaging with environment	80	40
<i>SLD</i> : Intact verbal communication	80	40
<i>SLD</i> : Has a desire to please others	40	80
<i>TBI</i> : Atypical patterns of learning acquisition (plateaus and regressions)	80	20
<u>Concept That Earned 40-60 Agreement in Round 2</u>	<u>Percentage of School Psychologists who Agreed</u>	<u>Percentage of Clinical Psychologists who Agreed</u>
<b>Sources of Information to confirm or disprove hypothesis</b>		
<i>ID</i> : Social skills assessment	40	75
<i>ID</i> : Pragmatic language Assessment	40	75
<i>ADHD</i> : Adaptive Assessment	40	75
<i>IG</i> : Speech/language/pragmatic assessments	40	75
<i>Anxiety Disorders</i> : Observe child interacting with parent/caregiver and in very familiar settings (through 2-way mirror if possible) to see if there are changes in communication and social interaction	40	75
<i>COS</i> : Language assessment	40	75
<i>COS</i> : Play assessment	40	100
<i>SLD</i> : Language assessment	40	100

## Summary

Experts in ASD assessment were questioned until they reached consensus about what forms clinical judgment takes during an evaluation, characteristics of ASD most important to differentiation, shared and differentiating characteristics of several conditions commonly mistaken for ASD, and the process of confirming or disproving one's clinical judgment through the evaluative process. The results of these rounds of questioning led to the creation of a decision-making guide entitled, *Beyond Test Results: Developing Clinical Judgment to Differentiate Symptoms of Autism Spectrum Disorders from Those of Other Childhood Conditions*. The implications of these findings and potential impact of these guidelines will be discussed in the following chapter.

Table 56

*Trends by Alternate Condition*

Theme	Number of concepts in each category by condition									
	<u>ID</u>	<u>ADHD</u>	<u>SLI</u>	<u>IG</u>	<u>Anx.</u> <u>Dis.</u>	<u>Mood</u> <u>Dis.</u>	<u>COS</u>	<u>DTA</u>	<u>SLD</u>	<u>Total</u>
<b>Shared Characteristics</b>										
Communication	1	1	6	2	2	0	1	1	1	15
Social Presentation	2	5	2	3	3	4	3	5	0	27
RRB	2	1	0	2	2	0	1	0	0	8
Sensory	0	0	0	0	0	0	0	1	0	1
Response to change/ inflexibility	0	0	0	1	3	1	0	2	0	7
Cognition	4	0	0	1	0	0	0	1	6	6
Emotional and behavioral regulation	0	2	0	0	2	4	4	6	0	18
<b>Differentiating Characteristic</b>										
Communication	2	2	3	3	1	2	1	0	0	13
Social presentation	8	6	4	3	2	2	1	1	3	31
RRB – qualitative difference	0	0	0	2	1	0	0	0	0	3
No RRBs	1	2	1	1	0	0	0	0	1	6
Play	0	1	1	0	0	0	0	1	0	3
Academic performance/ cognition	0	0	1	4	2	0	1	0	3	11
Emotional/ behavioral regulation	0	0	1	1	3	2	2	0	0	9

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Response to intervention	0	1	0	0	1	1	1	1	0	5
History	3	2	0	1	1	3	3	2	1	16
Overall pattern/ consistency in presentation of symptoms	1	1	0	1	1	1	1	1	0	7

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## Chapter 5: Discussion

The overarching purpose of this study was to understand how experts use clinical judgment to differentiate symptoms of ASD from those of other childhood conditions. In order to satisfy this study's overarching purpose, several rounds of iterative questioning were used to survey school-based and clinical psychologists who were self-identified experts in ASD evaluation and identification. These rounds of questioning were repeated until the expert participants reached consensus regarding the use of clinical judgment in the process of differentiating ASD from other childhood conditions. Ultimately, the consensus formed during this study led to the creation of several guidelines regarding the use of clinical judgment in evaluations for students with suspected ASDs. Supplementary analyses of the results revealed interesting between-group differences and areas of focus.

### Findings

Specifically, this study explored (1) what characteristics experts consider when using clinical judgment to determine if an individual has ASD; (2) how experts use clinical judgment to decide whether the aforementioned characteristics are attributed to ASD or to another condition; and (3) what sources of information experts use to confirm or reject their clinical judgment in the process of diagnostic decision-making.

**Characteristics of ASD most important to differentiation.** This study resulted in a list of 19 characteristics that the expert participants agreed form a constellation that

they would recognize as ASD, hereby referred to as “the constellation.” Experts also agreed that they may find some select characteristics in a child without ASD, but the entire constellation would mostly be lacking. Many, but not all of the characteristics in the constellation can be found in the DSM-V (APA, 2013), and conversely several characteristics found in the DSM-V and existing literature were not included in the constellation. The results from this study support the idea that solely relying on the DSM-V may paint an overly narrow picture of ASD, whereas collecting all possible symptoms of ASD from the existing literature would be an overwhelming task. It can be surmised that this study include the most salient features to which an expert may attend during an evaluation while excluding features that may not be as important to differentiation.

During response analysis for this study, I noticed that the majority of participants used the terms “odd” “atypical” and “unusual” to describe characteristics of ASD and the terms “limited” or “delayed” to describe the characteristics of other conditions. In Round 2, I asked participants to differentiate characteristics that are odd from those that are delayed. After coding and compilation, the expert responses led to the following comparison table (Figure 8). Though the terms “odd” and “unusual” are common terms to describe the behaviors of children with ASD, they are infrequently defined. The definition created in this study could be an essential component of developing clinical judgment during symptom interpretation and differentiation.

**Differentiating ASD from other childhood conditions.** The study results indicated that experts use their clinical judgment to cognitively integrate the constellation

Odd/Unusual	Delayed/Limited
<p>Odd and unusual behaviors are those that are distinctive and that most people would think are strange. These behaviors do not fall within the typical developmental trajectory and are not seen at any stage of a child's development. The quality of these behaviors feels overly formal, stilted, not coordinated with other modes of communication, and/or learned and rote rather than natural. Examples of oddities pertaining to speech quality may include different or unusual tone, prosody, fluidity, or repetitiveness.</p>	<p>Delayed and limited behaviors are those that would be typical of a younger child, are demonstrated inconsistently, and/or seem to be in the process of developing. One example might be how a tantrum is typical of a 2-year-old, but if seen in a 13-year-old, you might say there were delays in emotional regulation.</p>

Figure 8. Differentiation of odd and delayed behavior.

discussed above with their knowledge of several other conditions to determine whether a child has ASD. In addition to observing or not observing the constellation of characteristics described above, participants reported thinking about the overall presentation of a child and whether it “fit” with ASD or with an alternate condition. The study results as they pertain to each of those alternate conditions are discussed below.

***Differentiating ASD from SLD.*** During the second round of questioning, a small percentage of participants reported that there are few to no commonalities between ASD and SLD, and thus it should not be difficult to differentiate. When this idea was re-presented to the participants in Round 3, most disagreed and referred to the participant-generated list of SLD characteristics that may mimic ASD when arguing that it is important to consider SLD as a potential differential for ASD. In general, the literature on differentiating ASD from SLD focuses on Nonverbal Learning Disability. These results added to the existing body of literature by defining several characteristics of SLD in general that may mimic ASD during an evaluation process including poor abstract reasoning, anxiety, and slow auditory processing speed. An area of future research in this

area might be asking experts to further describe through example how these characteristics might present themselves during the evaluative process.

Results from this study also suggested that several red flags exist that may lead an evaluator away from suspecting ASD and toward suspecting SLD. These characteristics included a pattern of cognitive and academic performance and progress that is recognized as SLD paired with a lack of ASD-specific features. Thus far, there exist no readily available differentiation guidelines that presents these characteristics in one succinct list.

Overall, the results of this study suggest that differentiation of ASD from SLD is an important consideration that may be overlooked by researchers and evaluators alike. These results as they appear in the guidelines could be a valuable addition to a diagnostician's toolbox when conducting school-based evaluations.

***Differentiating ASD from ADHD.*** The body of literature on differentiating ASD from ADHD is quite extensive and includes research on the challenges posed by common assessment and screening measures. Expert participants in this study expanded on the current literature base by developing several key characteristics that help them distinguish ASD from ADHD when standardized assessment scores cannot be depended on. Most notable in this list were characteristics that are not captured in many current ASD or ADHD assessments or evaluation guidelines and include appropriate social development in the first year, desire to engage with others, even if not successful, and positive response to ADHD-specific interventions. Though many of the additional characteristics included in the final results can be found in existing literature, I was not able to identify guidelines that list all of these characteristics in one place. The list and

cognitive maps as developed in this study could potentially reduce the chance of evaluator error that may occur due to limits of working memory when trying to sort through existing literature.

During Round 1, most participants listed that challenges with social play and reciprocity are context-dependent in ADHD and consistent in ASD. During Round 2, they were asked to expand on this idea. Their responses were compiled and coded and resulted in the following comparison table (see Figure 9). Noting whether a child’s social challenges are consistent or context-dependent and linked to ADHD-like behaviors is a concept that does appear in existing literature. However, an expanded qualitative description is something that I did not find to exist in current literature. This glimpse into the thought process of experts is something that could be useful to a novice evaluator who is trying to develop expertise in differentiating ASD from ADHD.

<b>Consistent challenges with social and play reciprocity of ASD</b>	<b>Context-Dependent challenges with social and play reciprocity of ADHD</b>
<p>Children with ASD may be interested in interacting with peers. However, they have unusual or awkward social skills, even when they are focused, attentive, and interested in the interaction. Children with ASD may need play or social interactions to be the same every time and have difficulty dealing with novelty. Children with ASD may annoy peers, but it will be less other-focused/intentional, and more due to self-focused behaviors.</p>	<p>Children with ADHD have a desire and interest in interacting with others and will generally initiate social interactions with peers. These interactions may start off well, but the child with ADHD may drift off or engage in inappropriate behaviors after some time. These inappropriate behaviors such as interruptions or impulsivity may lead to peer rejection. Further, not focusing on the words or actions of others may lead to misunderstandings. Due to this rejection, children with ADHD may react negatively, withdrawal, or try to intentionally get a “rise” out of a peer as a way of interacting.</p>

Figure 9. Context-dependent vs. consistent social behaviors of ASD and ADHD.

This study also resulted in an extensive list of qualities of children with ADHD that may mimic ASD during an evaluative process. Many of these characteristics appear



in the current literature base, but the work an evaluator would have to do to pull all of the research together would likely not be feasible within an evaluative process. The results from this study form a concise list of characteristics to which an evaluator may refer to quickly and easily. During Round 1, one concept, poor social interaction, was listed by most participants as a characteristic that appears in both ASD and ADHD and may be a confounding factor in the differentiation process. In Round 2, participants were asked to expand on this concept, and their compiled and coded responses led to the development of the following comparison table (Figure 10). This table provides insight into the subtle differences between a shared characteristic and may be a valuable tool for an evaluator who knows there are social challenges but is having difficulty determining their source.

<b>Poor Social Interaction and Engagement of ASD</b>	<b>Poor Social Interaction and Engagement of ADHD</b>
<p>Children with ASD are generally difficult or awkward to connect with. Their responses feel odd or unusual, even if the interactions are highly structured and they are focused on the interactions. You are less likely to see a positive change in how natural an interaction feels with intervention. Things like empathy and understanding social nuances and cues are lacking, even when outside of a social situation.</p>	<p>Children with ADHD feel easier to connect with. For instance, even if they are moving all about the room and interactions are brief, there still might be friendly back-and-forth banter. They respond to others in a reciprocal way (when they are paying attention) and demonstrate empathy toward others. Children with ADHD may role-play appropriate social behavior well, but have difficulty demonstrating it in the moment. They understand social nuances in a 1:1 setting, but may miss cues in the moment. When they are highly motivated, you may see appropriate social interactions with peers.</p>

*Figure 10.* Differentiation of the poor social engagement seen in ASD and ADHD.

Overall, the results of this study expanded on current literature and also led to the creation of a compilation of shared and differentiating characteristics of ASD and ADHD as they appear to expert evaluators that may work to free evaluator time and mental energy during an assessment process.

***Differentiating ASD from ID.*** Differentiating ASD from ID is a complicated process that has a moderate research base. Most notably, current research indicates that popular screening and assessment measures are not always reliable for differentiating these two conditions (Havadahl et al., 2016). Diagnosticians must rely on clinical judgment to integrate the assessment results with subtle differences in presentation. Experts in this study collaboratively produced a list of several ways in which ID may mimic ASD, many of which were characteristics linked to a younger developmental level. Many of these characteristics are found in existing literature, but this list both expanded on the current literature base and focused on the most pressing and often observed characteristics. Of these characteristics, poor communication was listed by most participants in Round 1. During Round two, participants were asked to explain their thinking about how poor communication seen in ASD differs from that seen in ID. Their responses resulted in the development of the following comparison table (Figure 11). This illumination of expert judgment and thought processes around differentiating ASD from ID is something that is not found in current assessment guidelines and could work to provide an extra layer of support to a novice evaluator. Participants were also asked to explain what child characteristics would lead them away from suspecting ASD and toward suspecting ID. Their responses led to the creation of an extensive list, which both

reflected and added to the current body of literature. In addition to a lack of ASD-specific behaviors such as echolalia or repetitive speech, expert responses focused on social qualities that are observed in children with ID, indicating that careful observation of social interaction may be an important component of differentiating ID from ASD. One additional characteristic, repetitive behaviors, appeared in both the shared and differentiating lists. Study time constraints did not allow for this to be questioned further, but this was an interesting finding that may be worthy of follow-up.

Poor Communication of ASD	Poor Communication of ID
<p>Children with ASD have unusual patterns of communicative strengths and weaknesses. You might see patterns such as expressive language being stronger than receptive, or a strong expressive vocabulary with difficulty applying it flexibly to social situations. There is generally a lack of nonverbal compensation for communicative difficulties. Finally, you would expect to see some sort of communicative atypicality such as odd use of words, stereotyped language, or odd tone and prosody.</p>	<p>Children with ID have delays in their communication, but are generally not atypical communicators. Their adaptive, cognitive, and language profiles may be even, and you likely won't notice a significant strength in any of those areas. Children with ID will likely demonstrate skills that you would expect to be lacking in a child with ASD including use of and response to gestures, eye contact, and facial expression. There will usually be some effort to engage with others, even if nonverbally. An examiner might also notice that it is easy to get the child to respond to social interaction.</p>

Figure 11. Differentiation of the poor communication seen in ASD and ID

**Differentiating ASD from DTAs.** Much of the current literature on the subject of differentiating ASD from DTAs suggests it is a challenging process and the results of this study reflected that. DTAs were one of two conditions in this study's results where the list of characteristics that mimic ASD outweighed the list of characteristics that differentiate it from ASD by several items. In fact, participants were only able to identify 5 qualities of DTAs that differentiate them from ASD. Most of these characteristics had to do with the child's trauma and development after the trauma, rather than observable

qualities of the child himself. As far as characteristics of DTAs that may mimic ASD, the list was quite extensive and included social communicative, restricted and repetitive, and associated qualities, many of which reflect the current research on the subject. However, unlike current literature which tends to focus on one characteristic or a small set of characteristics, these results compiled an extensive expert knowledge base into a concise table, which may prove to be useful for evaluators who are trying to determine to which condition a child's behaviors are ascribed. Overall, the results of this study indicate the differentiating ASD from DTAs is an important part of the evaluative process, and that examination of a child's developmental history prior to and after a trauma is essential.

*Differentiating ASD from anxiety disorders.* Due to the constraints of this study, multiple anxiety disorders including general anxiety, selective mutism, social phobia, and obsessive-compulsive disorder were considered together, rather than as separate entities. Not considering these disorders separately could be considered a limitation to this study, however, it may not be a school-based evaluator's role to narrow down the specific anxiety-based disorder, so these results may be appropriate for the intended purpose of assisting school-based evaluation teams.

The list of characteristics of anxiety disorders that may mimic ASD covered a wide array of topics ranging from poor social interactions, to repetitive play, to rigidity, and nervous behaviors that may look like repetitive motor movements. These characteristics generally reflected current research and guidance on the topic, but as like other conditions, these results offer a way for evaluators to get all the information in one place, rather than having to sort through multiple sources. Further, the participants

offered some subtle characteristics that expand upon the straightforward symptom lists that may be discussed in the literature. For instance, whereas the literature may say “rigidity”, these results specify that this pertains to an insistence that things go a certain way. Further, many of the symptoms agreed upon by experts in this study have the qualifier “in unfamiliar situations” which is an important distinction to make between ASD and anxiety disorders. Overall, this list of characteristics could be helpful in demonstrating to school-based evaluation teams that anxiety can manifest itself in ways that mimic ASD in all domains of functioning.

Though these results suggested that differentiating ASD from anxiety disorders may be a challenging task, an extensive list of characteristics that may help to differentiate was also developed. These characteristics added to existing literature in several ways. First, some characteristics focused on the importance of noting the difference in social interaction and apparent RRBs in familiar vs, unfamiliar settings. Second, an emotional theme emerged with experts tending to cue into how much a child notices others and stressed that whereas a child with ASD may be aloof or oblivious to the feelings of others, a child with anxiety and not ASD may be so aware of what others are thinking that they present as overly empathetic or apologetic. Finally, these results suggested that while social difficulties exist in anxiety disorders, they do so in the absence of unusual behaviors commonly linked to ASD, highlighting the qualitative difference between the two conditions. Overall, these results led to the compilation of several shared and differentiating characteristics of ASD and anxiety disorders that are important to differentiation. These characteristics, as presented in a simple and user-

friendly format could greatly reduce the mental load of novice evaluators when trying to determine to which condition a child's behaviors are attributed.

*Differentiating ASD from mood disorders.* Due to the constraints of this study, mood disorders included both major depression and bipolar disorder. Combining these two conditions was deemed appropriate for school-based teams. Expert participants agreed on eight characteristics of mood disorders that may mimic ASD. These characteristics were primarily focused around emotional regulation and social interaction and communication and did not include any restricted and repetitive behaviors, though rumination, pacing, hand-wringing, and self-injury are mentioned in the literature as characteristics of mood disorders that may mimic RRBs. However, these results indicate that when attempting to differentiate ASD from mood disorders, expert evaluators tend to cue into the social and emotional quality of the child, rather than any existing repetitive behaviors.

When asked to describe what red flags would prompt them to suspect a mood disorder rather than ASD, participants developed an extensive list of suggestions including examining the child's developmental and family history, mood across settings, content and quality of social responses, timing of development of social challenges, and the root of social difficulties. This list adds to the current body of literature by suggesting that in addition to noting a lack of key indicators of ASD, experts focus on early history and the quality of social interactions as well as the quality and function of the student's social difficulties. Overall, these results indicate that differentiating ASD from mood disorders is a complex process that should include a thorough examination of the

student's history and symptom onset, as well as the quality of social interactions and communication.

*Differentiating ASD from COS.* COS is described as nearly impossible to distinguish from ASD in early years without clinical expertise (Bevan Jones et al., 2012), but there is little in the literature that describes those subtle qualitative differences that an expert evaluator may notice. The results from this study reflected that distinguishing ASD from COS is a complicated process indeed. First, COS was the only condition where the terms “odd” and “unusual” were used as frequently as they were in describing children with ASD. Second, the list of shared characteristics outweighed that of differentiating characteristics by several items and included all dimensions of ASD symptomology including social communication and restricted and repetitive interests and behaviors. Among distinguishing characteristics that experts might notice as “red flags” for suspecting COS rather than ASD were erratic patterns of social engagement that swing from typical to highly unusual, and the ability to describe one's own thoughts. One of the key takeaways from the results was the importance of following a child with ASD over time to ensure that the initial diagnosis was correct, as schizophrenia becomes more evident and easier to distinguish from ASD as the child ages. This notion challenges current belief held among many in the field that ASD is a life-long disorder and suggests that rather than a record review, a careful and thorough examination of a child's symptoms through the re-evaluative process as the child ages is an important. Overall, the results of this study align with research that indicates that differentiating ASD from COS

is a challenging task, and that confirming the initial diagnosis may be a process that takes several years.

*Differentiating ASD from IG.* ASD-like characteristics of IG have gotten recent attention in both research efforts as well as websites and books geared toward parents and educators of children identified as gifted (Webb, 2018). According to available literature, characteristics of IG that may resemble those of ASD include difficulties with social relationships, restricted interests, rigidity, and associated characteristics such as hyperlexia or perfectionism. Most of the research tends to suggest that social difficulties appear after early rejection stemming from mismatch between the child with IG's and peer's intellectual levels. However, the results of this study indicate that many of the characteristics of IG that mimic ASD extend beyond early social rejection. These characteristics include the appearance of social awkwardness and use of formal language that may appear scripted.

The characteristics that experts agreed distinguish IG from ASD resulting from this study expanded on existing research in several ways. Experts agreed that children with IG have social insight, intact theory of mind, and may have appropriate interactions with adults or peers with similar intellectual abilities. Regarding perseverative interests, experts agreed that these tend to evolve over time, rather than remain static. In fact, experts were asked to expand on this topic and provide further insight, and their responses led to the development of the following comparison table (Figure 12). This table provides a glimpse into the expert thought process around differentiating ASD from IG and could prove a valuable addition to the toolbox of a novice evaluator.



Intense and Perseverative Interests of ASD	Intense and Perseverative Interests of IG
<p>The intense and perseverative interests that occur in children with ASD can lead to adaptive and social impairment. Children with ASD tend to recite facts about their interests, and these interests do not tend to evolve over time. Further, children with ASD may have a more difficult time fitting their interests into a larger context of knowledge and will likely not ask others thoughtful questions about their interests. These interests may seem unusual for the child's developmental level, or in an area in which others have little interest.</p>	<p>The intense and perseverative interests that may occur in children with IG do not lead to adaptive or social impairments. They may ask others thoughtful questions about their areas of interest, or seek out experts in the field to befriend. Children with IG can and do show interest in other topics and can switch their interest off if it is interfering with social connections. The interests of children with IG tend to involve a greater depth of comprehension and they can fit these interests into a larger context of knowledge. These interests tend to evolve over time.</p>

Figure 12. Differentiation of the intense and perseverative interests seen in ASD and those of IG.

Overall, the results of this study indicate that when experts use their clinical judgment to differentiate ASD and IG, they attend to subtle child characteristics as they occur over time and across different settings. These guidelines could help novice evaluators attend to and analyze the most important features when trying to differentiate ASD from IG.

***Differentiating ASD from SLI.*** Literature on differentiating ASD from SLI typically focuses on social-pragmatic communication disorder (SPCD). There is ample guidance on differentiating ASD and SPCD, which generally includes noticing the presence or absence of RRBs. In order to contribute to a potential gap in the literature, this study focused on SLI in general. These results added to available research by identifying several characteristics a child with SLI may demonstrate that could potentially be confused for ASD including possible nonverbal presentation, poor conversational skills, reluctance to interact with others, and using echolalia while learning new language.

The biggest red flag that experts notice when suspecting SLI instead of ASD is a lack of ASD symptoms in the presence of social and language impairments. In particular, experts agreed that characteristics such as nonverbal compensation for poor language, limited but not unusual language, and age-appropriate play interests in combination with a lack of RRBs might lead them to suspect SLI instead of ASD.

***Differentiating ASD from TBI.*** The category of TBI was eliminated from the study after Round 2 due to high participant agreement that depending on area of injury, the possibilities for symptom presentation were too broad and any number of symptoms that mimic ASD may or may not be present. Due to this finding, it remains clear that exploring a child's history for potential TBI should continue as best practice in evaluating for the presence or absence of ASD.

**Confirming one's diagnostic suspicions.** In order to make a final determination about whether or not a child has ASD, experts compare, contrast, and integrate clinical judgments formed through observations with formal and informal test data. The final part of this study asked participants to reach consensus about how they would confirm or deny a suspicion that a condition other than ASD was the actual root of a child's difficulties. Three rounds of questioning led to a list of several assessment and evaluative procedures for ASD and each alternate condition. Many of the items in this list have an associated area of focus, which could prove to be helpful to novice evaluators. For instance, instead of simply stating, "observe the student in multiple environments and conduct parent and teacher interviews" as a recommended assessment procedure for differentiating ASD

from DTAs, this list suggests that during observations and interviews the evaluator focus on approach/avoidant behaviors in a variety of social contexts.

One interesting finding discovered during supplementary data analysis is that language-based assessment was proposed by at least one participant in Round 1 as an important factor in confirming or ruling out diagnostic impressions, but in almost every instance, earned exclusionary consensus. This is also interesting because language similarities and differences were included in the comparison charts for every differential condition in the study. Further investigation may be needed to determine if participants disagreed that language assessment was important, or if it simply fell outside of their area of expertise.

Overall, this list of assessment procedures designed to confirm or rule out diagnostic impressions developed in this study was unlike anything I found when reviewing assessment handbooks, texts, and state guidelines and has the potential to serve as a framework for school-based evaluation guidelines in the future.

### **Supplementary Analysis**

To examine both between-group differences and trends that arose within overall participant responses, supplementary analyses were conducted. These analyses led to several interesting findings regarding differences between school and clinical psychologists, as well as overall trends in the results.

There were several areas that school and clinical psychologists tended to differ in opinion. Four characteristics of ASD important to differentiation seemed to lead to disagreement among expert groups. School psychologists tended to agree with statements

pertaining to special considerations such as response to interventions, whereas clinical psychologists agreed more with statements regarding atypical assessment results and unusual eye contact. Characteristics of ID that may be mistaken for those of ASD seemed to be the source of most disagreement among professionals, with 7 concepts demonstrating clear between-group differences. School psychologists tended to agree more than clinical psychologists that children with ID may demonstrate perseveration and poor eye contact. Clinical psychologists tended to agree more than school psychologists that children with ID may demonstrate delayed responses, limited gesture use, self-injury, poor imitation, and may fail to respond to test items. Within the category of questions pertaining to “red flags” that may lead experts away from an ASD diagnosis, those pertaining to mood disorders seemed to have the most disagreement among expert groups. Clinical psychologists tended to agree more than school psychologists that a lack of self-stimulatory behaviors, intact theory of mind, and a typical cognitive profile would lead an expert to suspect that a mood disorder, rather than ASD, might be at the root of a child’s difficulties. Finally, for items pertaining to sources of information experts use to confirm or disprove their hypotheses, clinical psychologists seemed to agree more than school psychologists that all the listed formal assessments were valuable sources of information. Overall, whereas it is difficult to draw any conclusions based on these supplementary analyses, it can be surmised that variations in clinical judgment based on differences job roles and training do exist. Some of those differences may be due to accessibility of specialized tools, the opportunity to observe a student amongst peers and in natural settings, and the ability to observe a child’s response to interventions.

A second supplementary analysis was conducted to examine any areas of particular focus found in shared and differentiating characteristics that reached consensus for each alternate condition. In both the shared and differentiating categories, characteristics linked to social functioning were the most highly represented among all alternate conditions. This was followed by behavioral and emotional regulation in the shared characteristic category, and historical factors in the differentiating category. These results indicate that overall, children with poor social functioning and behavioral and emotional regulation may be the most difficult to accurately diagnose, and a careful examination of the quality of social interaction and a student's history may be the most valuable tools for accurate differentiation.

### **Implications for School Psychologists**

The results of this study have several important implications for school psychologists including expanding the concept and use of clinical judgment as an important part of evaluations, utility of the guidelines to support decision-making for novice evaluators, and considerations for assessment practices in general.

**Clinical judgment.** Though the concept of clinical judgment has been studied extensively and its definition delineated in the medical fields, in the realm of psychological diagnoses, it is generally less well-defined. The results of this study suggest that clinical expertise in differentiating ASD from other conditions is not simply a matter of knowledge and experience, but rather a multi-dimensional process that involves the *application* of one's knowledge and experience through careful integration

and interpretation of assessment results, engaging multiple cognitive processes, and collaboration with other experts.

The experts in this study were asked to describe their own use of clinical judgment during the diagnostic process; particularly when attempting to differentiate ASD from other possible conditions. Their collaborative efforts led to the development of several concepts and sub-concepts linked to the process of clinical judgment. These concepts both differ from established tools used in the medical field such as Lasater's Clinical Judgment Rubric (2011) and appear to fill in holes found in school-based assessment texts in several key areas. See Table 57 for a description of Lasater's Clinical Judgment Rubric.

Table 57  
*Lasater Clinical Judgment Rubric*

Domain	Components
Effective Noticing	Focused observation Recognizing deviations from expected patterns Information seeking
Effective Interpreting	Prioritizing Data Making sense of data
Effective Responding	Calm, confident manner Clear communication Well-planned intervention/flexibility
Effective Reflecting	Being skillful Evaluation/self-analysis Commitment to improvement

(Lasater, 2011)

First, the results of this study specified how experts employ the use of clinical judgment through psychological assessment practices. Specifically, experts agreed that they use clinical judgment when integrating test data, observing children in multiple settings, delving into a child's early experiences, and examining the consistency of behaviors. Guidelines regarding conducting multiple observations and delving into early

experiences are common in the field of school psychology. However, assessment practices such as integrating and comparing and contrasting informal with formal test data are noted, but not generally discussed in detail in popular school psychology assessment handbooks. Experts also reported examining the consistency of behaviors across contexts and throughout time. Noticing if the onset of ASD-like behaviors first appeared along with or subsequent to the development of symptoms of alternate conditions was a common theme throughout the study's results. However, in my review of assessment texts geared toward school psychologists, examining the timing and consistency of ASD-like behavior development was not commonly discussed. Overall, these results indicate that there may be a need for school psychology training regarding the use of clinical judgment during assessment planning, administration, and analysis.

The second category of clinical judgment, "Cognitive processes" is most closely aligned with the "Effective Noticing" and "Effective Interpretation" categories in the Lasater (2011) tool. Whereas Lasater's tool lists focused observations, recognizing deviations from the expected, information seeking, and making sense of data as key components, the experts in this study went a slightly different route. First, experts agreed that considering one's own biases and preconceptions is an important component of accurate decision-making. However, this concept often seems overlooked in school-based assessment and evaluation texts, and is also not listed in the Lasater (2011) tool. However, research has indicated that diagnostic decision-making is full of biases and errors. Keeping an open mind at case outset and letting data guide one's decision-making was another concept developed by the experts in this study. This concept in particular

seems to be at odds with the guidance many school psychologists receive, which is to focus their data collection efforts around the student's referral question. Experts in this study also agreed that while standardized assessments and the DSM-V (APA, 2103) criteria are important, they are only a piece of the puzzle and one's test scores, or seeming behavioral alignment with key DSM-V (APA, 2013) criteria do not a complete diagnosis make. Further, though experts agreed that the DSM-V (APA, 2013) criteria are a necessary starting point, only select states use these criteria in their eligibility checklists and future discussion around the benefits of aligning eligibility and clinical diagnostic criteria may be warranted. Finally, within the category of cognitive processes, experts agreed that noticing one's own personal and qualitative response to working with a child is an important piece of differentiating ASD from other conditions. One's personal and affective reaction to an interaction with a child is also one of the ADOS-II scoring criteria, however, there is little guidance about how to tell if an interaction with a child is uncomfortable due to ASD, another condition, or simply a mismatch in personalities between child and examiner.

The third category of clinical judgment developed in this study was Knowledge and Expertise, which aligns with the Lasater category of effective noticing and recognizing deviations from the expected. Within this category, two concepts were developed: *Applying knowledge of several conditions to analyze symptom crossover, fit, and mis-fit*, and *recognizing the influence and strength of key ASD characteristics*. Developing a strong working knowledge of the key characteristics of ASD and all the conditions that could mimic ASD is a process that could take several years and further,



pulling that knowledge to the forefront of one's mind during an evaluative process is subject to the limits of working memory. Tools such as the cognitive maps developed through this study could be a potential means of mitigating some of these challenges.

Consultation and Collaboration was the final category developed by the expert participants in this study. Overall, this concept recognized that the diagnostic process should not be an individual effort. Experts recognize the limits of their expertise and know when to consult with others in the field who may be experts. They may also consult with colleagues during all stages of the diagnostic process. The experts in this study also recognized the value of incorporating the perspectives of non-psychological disciplines during both the assessment and data analysis stages. In the school setting, a team approach is generally always used during a special education evaluation. However, the extent to which school-based teams engage in collaborative data analysis throughout the evaluation process is unclear. In school settings, asking an evaluation team to find time prior to a meeting to get together for collaboration and data sharing may be a tall order and further, there are legal ramifications to "predetermining" a child's eligibility for special education services and disability prior to an eligibility meeting (IDEA, 2004). However, a conversation about how school teams can engage in collaborative data analysis throughout the evaluative process may be warranted.

Clinical judgment is an important, but often overlooked and poorly defined component of the evaluative process. As a result, school psychologists may over-rely on test results, which may jeopardize diagnostic accuracy. In summary, it may be time for a conversation in the field of school psychology about how to develop clinical judgment in

novice school psychologists, as well as promote and respect the use of clinical judgment during school-based evaluations.

**Assessment practices.** A second implication of this study's results for school psychologists lies in consideration of current assessment practices. First, a positive response to disorder-specific intervention was included in the lists of differentiating characteristics for several conditions. As this was seen as an important factor in diagnostic accuracy amongst experts, it stands to reason that an intervention specific to a hypothesized alternate condition would need to be implemented at some point during the evaluation process. Though this is not a common practice at this point, exploration into the validity of experimental interventions during an evaluation may be warranted. Second, assessment handbooks and guides ask school psychologists to focus their assessment around answering the referral question. However, while a question such as, "What factors are inhibiting this student from engaging with his peers?" may lead to consideration of several possibilities from the outset, the question, "Does this child have X condition?" may not. The results from this study indicate that several conditions may present themselves in ways that mimic autism. As a result, school psychologists may wish to reconsider the tradition of sticking to the referral question and ask themselves whether reframing the referral question would support the mission of improving diagnostic accuracy. Tools such as the guidelines developed in this study may be one factor in helping school psychologists broaden the evaluative process.

**The guidelines.** The final results of this study led to the development of several concepts linked to the process of using clinical expertise during an evaluation that seeks

to differentiate ASD from other related conditions. Based off of the concepts that reached final consensus after Round 3, decision-making guidelines were developed. These guidelines, entitled *Beyond Test Results: Developing Clinical Judgment to Differentiate Symptoms of Autism Spectrum Disorders from Those of Other Childhood Conditions* (Appendix H) were designed to act as a support for school psychologists or school-based teams when attempting to decide if a child has ASD or another condition.

These guidelines cover topics pertaining to what forms clinical judgment takes during an evaluation, characteristics of ASD most important to differentiation, shared and differentiating characteristics of several conditions commonly mistaken for ASD, and the process of confirming or disproving one's clinical judgment through the evaluative process. The guidelines developed in this study illuminate the collective thoughts and opinions of a group of clinical and school-based psychologists with expertise in conducting evaluations to determine whether or not a child has ASD. These guidelines were developed with the intent to provide novice evaluators access to those invisible cognitive processes that underlie expert decision-making and have potential use in school psychology training programs, assessment and evaluation guideline development, and to inform the decision-making process of school-based teams.

A primary implication of the guidelines resulting from this study is the utility of the cognitive maps as a potential tool in increasing clinical expertise of novice school psychologists. While both tables and cognitive maps are used to display the data in the guide, tables display the data specific to each condition, whereas cognitive maps provide a visual that illustrates the decision-making process experts may employ when trying to

determine if the root of a child's challenges is ASD or another condition. There is evidence that studies which seek to understand the complex decision-making processes of experts lend themselves well to data representation via cognitive maps (Hassan, 2013; Maule & Maule, 2016). Indeed, several studies suggest that nondirectional cognitive maps developed by experts, when used as a supplementary evaluative tool, may help novice evaluators conceptualize cases as experts do (Gerdeman, Lux, & Jacko, 2012; Kaddoura, Vandyke, Cheng, & Shea-Foisy, 2016; Maule & Maule, 2016). Over time, the goal is that these cognitive frameworks become second nature to the novice, and in combination with increased experience and knowledge development, can potentially lead to an accelerated development of expertise. Ultimately, the cognitive maps developed in this study may be useful in school-psychology training programs or to help develop decision-making guidebooks for school teams.

A secondary implication of these guidelines is that by integrating expert thoughts, knowledge, and experience about decision-making processes as they pertain to differentiating ASD from other conditions into one easily digestible document, novice school psychologists will have a tool that may help to free space in their working memory in order to focus on applying the framework to their current case. Studies of decision-making error suggest that the limits of human memory and processing may prevent evaluators from simultaneously considering all relevant information when engaging in the decision-making process (Graber, 2009; Hassan, 2013; Lucchiari & Pravettoni, 2012; Thammasitboon & Curer, 2013). The experts in this study drew upon both their experiences and knowledge to develop the concepts that ultimately created the

guidelines. By narrowing down these concepts through the Delphi process, the hope is that only the most pertinent to differentiation were included in the guidelines. Though much of what was developed in these guidelines may be found in existing literature, the amount of effort it would take to digest and compile hundreds of pages of text is not feasible within an evaluative timeline and would exceed the limits of human memory and processing, potentially leading to increased diagnostic error. Further, a novice evaluator may not know which parts of the existing literature and child characteristics are most important to attend to, and as a result may make faulty decisions. Accurate identification of student disability in the school setting has wide-reaching implications including research accuracy, over and under-identification, disproportionality, appropriate allocation of resources, student growth, and teacher efficacy and burnout. It is my hope that this project and future work of its nature will ultimately lead to improved accuracy in the decision-making processes of school-based teams.

In sum, the concepts developed through this study and found in the guidelines could be useful in school psychology training programs, the design of assessment courses or texts, and could also help to inform school and state policy on assessment practices and requirements for ASD evaluations.

*A cautionary note for appropriate use of the guidelines.* Used in isolation, the guidelines developed in this study are best suited for instances where a child is unaffected by a variety of potential factors such as comorbid conditions, cultural and linguistic background that differs from the typical norming sample, or a personality that deviates from the norm. However, this type of case is unlikely to present itself in a real-life

evaluation. Take for instance the category of Anxiety Disorders. The list of characteristics that could mimic ASD is high in behaviors that resemble RRBs and low in behaviors that resemble social communicative challenges. In contrast, the category of SLI has few RRB-like characteristics and several social-communicative challenges. In combination, the two conditions could create a situation that could very much resemble ASD. In another instance, a student with IG who seems to perseverate on a topic of interest, and who is also shy and socially awkward may appear more like a child with ASD than would a socially outgoing child with IG. In yet a third example, a child with an obsessive compulsive disorder whose cultural norms lead to reduced eye contact may be more likely to resemble a child with an ASD, than would a child whose eye contact matches the cultural expectations of the examiner. Overall, these guidelines are meant to be one tool in an evaluative process, and the variables of comorbidity, cultural-linguistic differences, and variations in personality should be taken into consideration when interpreting symptom presentation.

### **Limitations**

Three key limitations that leaders in the field propose are inherent to the Delphi methodology and that appeared to influence this study include participant attrition, reduction of complexity, and poor question wording (de Meyrick, 2003; Donohoe & Needham, 2009). These as well as limitations specific to this study including demographics and limits of human knowledge are discussed below.

**Attrition.** The developers of the Delphi method stated that interest in and passion for the topic of study is an intrinsic motivator for study participation (de Meyrick, 2003;

Macmillan, 1971). However, questionnaire length and required time commitments often lead to attrition in Delphi studies. Additionally, participants who are not well prepared for the time commitment may leave the study or rush through their answers (de Meyrick, 2003). I addressed this first by clearly stating the anticipated time commitment in both the recruitment email and in each informed consent statement and questionnaire. Another way de Meyrick (2003) and Donohoe and Needham (2009) recommend to limit attrition is to keep questionnaires succinct. Questionnaires that are kept brief may also limit “artificial consensus” (de Meyrick, 2003, p. 14), where participants agree with the majority just so that they can be finished with the study. Due to the amount of data obtained in the *Scoping* and Round 1 questionnaires paired with the importance of presenting *all* data for initial consensus votes, I was unable to keep the Round 2 questionnaire brief. However, I used *Qualtrics*<sup>TM</sup> survey technology that allowed the participants to complete the questionnaires over several days or weeks. I also made several additional open-ended questions in Round 2 optional. Another method of limiting attrition is proposed by Gordon (2003), who lists personal contacts with participants as important to limiting attrition in Delphi studies. During the recruitment phase and each round of questioning, I sent personal follow-up emails to the participants. Finally, as an incentive, respondents were offered a copy of the final decision-making guidelines upon completion of the study.

Overall, despite my efforts to limit attrition, 60% of participants who completed the *Scoping* round did not complete Round 3. Attrition was particularly noticeable in the clinical group, where there was an 83% attrition rate. Factors that may have contributed

to attrition were the greater than anticipated length of time between questionnaire rounds and the length of questionnaires. Overall, attrition was a major limitation of this study.

Table 58 details the attrition rates of this study.

Table 58  
*Participant Attrition*

<u>Group</u>	<u>Scoping</u> <u>Participants</u>	<u>Round 1</u> <u>Participants</u>	<u>Round 2</u> <u>Participants</u>	<u>Round 3</u> <u>Participants</u>	<u>Total</u> <u>Attrition</u>
Clinical Experts	n=11	n=9	n=7	n=2	82%
School-Based Experts	n=9	n=6	n=6	n=6	33%
Total	n=20	n=15	n=13	n=8	60%

**Reduction of complexity.** Another documented limitation of the Delphi method is that of oversimplifying participant responses at the expense of the natural complexity of the problem. Though de Meyrick (2003) asserts that some simplification is necessary, he also cautions that researchers should be careful to not gloss over complex aspects of the problem or responses. I addressed this limitation by both being mindful of the tendency to oversimplify and also having a third party check my coding with oversimplification in mind. Overall, this third party did catch some instances where I oversimplified coding of responses in the *Scoping* round, and I was able to address this by changing my coding of these items. However, there remains the likely possibility that oversimplification was a limiting factor in this study.

**Question wording.** Poor questionnaire wording is another common limitation to Delphi studies. I addressed this by including a pilot for the Round 1 questionnaire, where several non-participants provided feedback on question wording. I also consulted with several non-participant colleagues in the development of the Round 2 and 3



questionnaires. Despite these attempts at clarity, two participants provided feedback that the questions were confusing, and one of those participants also seemed to provide answers that did not match the intended purpose of the question. As a result of participant feedback, I modified question wording from round to round in order to help increase clarity, which may have also muddled the end result. Further, it is possible that more participants were also confused by question wording, which may have altered the results.

**Participant demographics.** Specific to the limitations of this study included participant recruitment and scope of expertise. First, though there is a readily available database of clinical experts in ASD evaluation, there exists no such database for school psychologists. Further, school psychologists are a highly protected group of individuals, and district and school psychology association policy frequently limits or blocks access to school psychologists for research purposes. As a result, the pool from which I recruited school-based experts for this study was much more limited than that of clinical experts. Second, though I recruited participants who identified as experts in ASD evaluation and diagnosis, I also expected them to share their knowledge of several other childhood conditions. It is unclear if the participants also considered themselves experts in identifying these alternate conditions, and if not, how that lack of expertise may have contributed to the study results. One participant skipped sections of questioning for Childhood Onset Schizophrenia and Disorders of Trauma and Attachment, citing her lack of expertise in those conditions as her reasoning. The level of confidence in understanding characteristics of alternate conditions for the remaining participants remains unclear. As a result, it is possible that individuals with expertise in those

alternate conditions may have developed different sets of characteristics than those developed in this study.

### **Future Research**

To prevent attrition, this study limited the time commitment asked of participants as well as the length of the questionnaires. At several junctions in data analysis and iterative questionnaire development, I wanted to explore participant ideas further and in more depth, and several questions developed through the course of this study remain unanswered. The following are questions and potential studies that may contribute toward a robust future of research in this area.

First, during my literature review I learned about Fuzzy Cognitive Maps (FCMs), and I wonder how these results could contribute to the development of these useful diagnostic tools. Fuzzy cognitive maps (FCMs) are one type of cognitive map particularly suited for illuminating the decision-making processes of experts (Groumpos, 2010; Lucchiari & Pravettoni, 2012; Papageorgiou, 2010), and have been used in conjunction with Delphi studies (Nalchigar, Nasserzadeh, & Babak, 2011). These computer-based tools are developed by a panel of experts and are thought to give visual form to clinical expertise and combine type 1 and type 2 forms of reasoning (Groumpos, 2010; Lucchiari & Pravettoni, 2012). FCMs consist of individual nodes that represent different concepts and connecting arcs (Groumpos, 2010). Each connecting arc is assigned a “fuzzy” weight between -1 and 1 which is based on a linguistic label assigned by a group of experts (Georgopoulos, Malandraki, & Stylios, 2003). For instance, the label ‘Very Indicative’ might be assigned a 1, whereas “Very Contraindicative’ might be

assigned a -1. In developing FCMs for diagnostic decision making, a group of concepts chosen by experts are then rated and connected by weighted fuzzy arcs to different diagnoses (Georgopoulos et al., 2003). For example, after expert analysis, the symptom “Makes friends easily” might receive a -1 when connecting to ASD and a .2 when connecting to SLI. Once developed, these tools can then be used by examiners who enter observed characteristics into the program and obtain a report that states how likely it is that the individual has each considered diagnosis. Though a tool like this if used in isolation has the potential to lead to oversimplification of the diagnostic process, if used as a way to check one’s work so to speak, it also has the potential to reduce decision making errors such as confirmation bias if the results highlight alternate explanations for a child’s difficulties. An area of future research could be to recruit a large pool of experts who would use the results obtained in this study to create a FCM.

Second, as the guidelines are intended to improve diagnostic accuracy and expertise amongst novices, further research may be warranted to determine if they indeed carry out their intended purpose. One potential study could compare the evaluative process and end results of a group of experts, and two groups of novice evaluators who do and do not have access to the guidelines. Another potential study could examine the progression from novice to expert over time, and the role the guidelines may play in the development and timeline of that expertise. In order to meet both of these goals, future studies that involve participation from experts in each differential condition may be beneficial.

Finally, there are several areas of this study that could be expanded upon through future research. There were several junctures during the data analysis process that left me longing for more detailed explanations, examples, and descriptions of thought processes. However, time constraints limited the amount of additional questions I could ask. One area of future research lies in the expansion of the concepts developed in this study. Additional questionnaire administration or “live” cognitive interviewing of experts during an evaluative process could provide additional depth to the already established concepts. Further questioning would also be valuable in understanding the types of biases and preconceptions that expert diagnosticians notice, as well as how they engage in the process of self-analysis during the evaluative process. Other studies may seek to expand on the cognitive maps so that the consideration of comorbidity and cultural-linguistic differences are addressed. Overall, such studies could fill in the gaps and provide an additional layer of depth that was not able to be fully developed within the constraints of this study.

### **Conclusion**

The consideration of multiple explanations of a child’s challenges at the outset of the diagnostic process is too often left out of popular school psychology handbooks and evaluation guidelines. Too often, the utilization of clinical expertise as an, if not the most important diagnostic tool is overshadowed by texts and guidelines that emphasize formal assessment tools that have been shown to be faulty for many populations. As a result, there is a lack of guidance and support for professionals such as school psychologists in developing and using clinical expertise in the diagnostic decision-making process. It is

my hope that the guidelines developed through this study will have some role in the evolution of school-based ASD assessment practices as well as future research in the field of differentiating ASD from other conditions.

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## Appendices

### Appendix A: Recruitment Email

Dear \_\_\_\_\_,

I am a doctoral student at the University of Denver's Child, Family, and School Psychology program and am in the process of completing my dissertation on differential identification of Autism Spectrum Disorders (ASDs) in school settings. My faculty sponsor is Devadrita Talapatra, PhD. I am seeking experts in the field of ASD assessment and diagnosis to participate in this study. For the purposes of this study, eligible participants are those who:

- Are fully licensed psychologists or school psychologists who work 20 or more hours per week in public school, hospital, clinical, or university settings
- Have worked in the field of ASD assessment and diagnosis for at least 3 out of the last 5 years
- Have conducted 20 or more evaluations of children with suspected ASDs in the past 3 years

If this sounds like you, I would love to include your voice in this study!

The goal of this study is to understand how experts use clinical judgment to determine if they will consider differential conditions after receiving a referral for a child with suspected ASD. The findings will be compiled into cognitive maps which may prove useful for training purposes. The collective knowledge of several experts will inform the development of these cognitive maps, which will serve as some of the first of their kind of this nature.

Your participation in this study would involve answering up to four rounds of questionnaires over a three-month period. Each questionnaire is anticipated to take no more than 1 hour. The answers you and the panel of experts provide will be anonymously re-presented to the group for collaboration and feedback. You will also have the opportunity to engage in a "Final Member Check" where you can review the cognitive maps for accuracy and suggest any changes should you desire. Participation in this study will give you an opportunity to gain insight into the decision-making processes of fellow experts. Your participation will remain anonymous and confidential for the life of the study. As a thank you for your participation, you will be provided with a copy of the cognitive maps.

If you are interested in learning more about the study or have any questions, please contact me at [sjordan184@gmail.com](mailto:sjordan184@gmail.com). If you are interested in participating in the study, please use the link below to access the statement of informed consent and an eligibility survey. If found eligible given the criteria listed above, the first brief questionnaire will follow.

**[https://udenver.qualtrics.com/jfe/form/SV\\_8uzMaMUfXU8X7HD](https://udenver.qualtrics.com/jfe/form/SV_8uzMaMUfXU8X7HD)**

Thank you for your time and consideration.

**Sincerely,**

Staci Jordan, EdS, NCSP

## Appendix B: Statement of Informed Consent



**Title of Research Study:** The Use of Clinical Judgment in Differentiating Symptoms of Autism Spectrum Disorder From Those of Other Childhood Conditions: A Delphi Study

**Researcher(s):** Staci Jordan, EdS, NCSP, Devadrita Talapatra, PhD

**Study Site:** Online

### **Purpose**

You are being asked to participate in a research study. The purpose of this research is to discover key decision-making factors of differential diagnosis of Autism Spectrum Disorders (ASDs) in school settings. Your participation will lead to understandings in how experts in the field of ASD evaluation and diagnosis make decisions regarding evaluation of conditions other than ASD. Your completely voluntary participation would help me to develop decision-making guidelines for school teams to use when evaluating students with suspected ASD. In addition, this study will fulfill the dissertation requirements of the primary investigator.

### **Procedures**

If you participate in this research study, you will be invited to complete several rounds of brief questionnaires via internet-based survey program. The lead researcher will email you up to four rounds of questionnaires over a twelve-month span of time. Each questionnaire is anticipated to take no more than 60-90 minutes to complete.

### **Voluntary Participation**

Participating in this research study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to answer any survey question or entire questionnaire for any reason and at any time. Refusal to participate in any part of the study or withdrawing from the study at any time occurs without penalty or other benefits to which you are entitled.

### **Risks or Discomforts**

During this study you will be asked to share your opinions regarding the evaluation process of children with suspected ASD and other conditions. Your responses will be anonymously combined with those of other experts in the field of ASD and re-presented to the group of participants. Participants will then have the opportunity to comment on or rate the importance of the survey responses. Potential risks and/or discomforts of participation may include having others disagree with your opinions or rate your responses as “not important” to the process of decision-making. This may lead to feelings such as self-doubt or lack of confidence in one’s own expertise. If the process is upsetting in any way, the researcher can provide resources to support you.

### **Benefits**

Possible benefits of participation include an opportunity to indirectly collaborate with other experts in the field of ASD evaluation. Through this experience, you will get the opportunity to share your own expertise as well as gain an understanding of the opinions and expertise of others. Your participation will also contribute to the body of evidence surrounding differential diagnosis of ASD. Overall, the ability to participate in a unique study in an area of your interest and expertise may be the biggest benefit.

#### **Incentives to participate**

There will be no monetary reimbursement for participating in this study. If requested, the lead researcher will send you the final results of the study. You will also receive a copy of the final differential decision-making support document.

#### **Confidentiality**

This researcher will treat all information received from you as confidential and will keep your information safe throughout this study. Your name and personal information will be kept separate from any survey answers you provide. Furthermore, your individual identity will be kept private when information is presented or published about this study.

However, as this study will utilize **Qualtrics**, please note that the data you provide may be collected and used by **Qualtrics** as per its privacy agreement. This research is only for U.S. residents over the age of 18 (or 19 in Nebraska). Please be mindful to respond in private and through a secured Internet connection for your privacy. Your confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Should any information contained in this study be the subject of a court order or lawful subpoena, the University of Denver might not be able to avoid compliance with the order or subpoena. The research information may be shared with federal agencies or local committees who are responsible for protecting research participants.

#### **Questions**

If you have any questions about this project or your participation, please feel free to contact the primary researcher, Staci Jordan, at [sjordan184@gmail.com](mailto:sjordan184@gmail.com) at any time or the faculty sponsor, Devadrita Talapatra, at [devadrita.talapatra@du.edu](mailto:devadrita.talapatra@du.edu).

If you have any questions or concerns about your research participation or rights as a participant, you may contact the DU Human Research Protections Program by emailing [IRBAdmin@du.edu](mailto:IRBAdmin@du.edu) or calling (303) 871-2121 to speak to someone other than the researchers.

Please take all the time you need to read through this document and decide whether you would like to participate in this research study.

If you agree to participate in this research study, please continue by clicking the "next" arrow below. This will take you to a brief demographic survey as well as questions to ensure you are eligible for this study. If eligible, you will also be asked to complete the first of 4 rounds of questionnaires about your use of clinical expertise.

## Appendix C: Scoping Round Questionnaire

What is your age?

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What is the highest level of school you have completed or the highest degree you have received?

- Master's degree
- Educational Specialist
- Doctoral degree
- Other (please specify)

Choose one or more races that you consider yourself to be:

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Hispanic/Latino
- Other (please specify)

With which gender do you identify?

Male

- Female
- Other

What is the ZIP code in which you work?

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What is your email address? (You will be contacted via email up to 4 times during the duration of this study)

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What is your profession?

- A licensed psychologist or school psychologist who primarily practices in a public school, clinical, university, or hospital setting
- I am not a licensed psychologist or school psychologist

(Skip To: End of Block If What is your profession? = I am not a licensed psychologist or school psychologist)

Where is your primary place of employment?

- A clinical, university, or hospital setting
- A public PreK-12 school setting
- I do not work in either of these settings

Skip To: End of Block If Where is your primary place of employment? = I do not work in either of these settings

End of Block: Demographics

Start of Block: Clinical Inclusionary Criteria

In what setting type do you currently practice (choose all that apply)

- Clinical
- Hospital
- University
- Other

Do you work 20 hours per week or more (combined) in a clinical, hospital, or university setting?

- Yes

- No

Skip To: End of Block If Do you work 20 hours per week or more (combined) in a clinical, hospital, or university setting? = No

Do your job responsibilities include (select all that apply)

- Conducting evaluations for suspected Autism Spectrum Disorder (ASD)
- Supervising others who conduct evaluations for suspected ASD
- Teaching graduate level students how to conduct evaluations for suspected ASD
- My job responsibilities include none of the above

Skip To: End of Block If Do your job responsibilities include (select all that apply) = My job responsibilities include none of the above

How many years of experience do you have with conducting independent (non-supervised) evaluations for suspected ASD in the PAST 5 YEARS?

- Fewer than 3 years
- 3-5 years

Skip To: End of Block If How many years of experience do you have with conducting independent (non-supervised) evaluations... = Fewer than 3 years

How many TOTAL years of experience do you have with conducting independent (non-supervised) evaluations for suspected ASD?

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How many evaluations for suspected ASD have you conducted or supervised in the past three years?

- 0-19
- 20 or more



Skip To: End of Block If How many evaluations for suspected ASD have you conducted or supervised in the past three years? = 0-19

Skip To: Q21 If How many evaluations for suspected ASD have you conducted or supervised in the past three years? = 20 or more

You are eligible for participation in the study! Please take a few more moments to read the study objectives and answer two brief questions regarding your overall thoughts on the matter.

Please review the following purpose statement for the study: The Use of Clinical Judgment in Differentiating Symptoms of Autism Spectrum Disorder From Those of Other Childhood Conditions: A Delphi Study

**Purpose Statement:**

Leading experts in ASD diagnosis agree that one cannot rely on test scores alone to determine whether a student's symptoms are due to ASD or another condition. Rather, it is a combination of test scores, developmental history, careful observations, and most importantly "clinical judgment" that leads to the most accurate diagnosis (Lord et al., 2006; Reaven et al., 2008; Saulnier & Ventola, 2012; Wiggins et al., 2015). Similar terminology is used to describe the symptoms of multiple conditions, with the expectation that the examiner will be able to use his or her clinical expertise to differentiate subtle differences in presentation. Often, the difference between a problem resulting from ASD and the same problem resulting from another condition is something an expert in ASD just knows, but cannot quantify through formal testing. In order to assist school teams who may lack clinical expertise yet are still in a position of providing an educational identification, this study seeks to identify the decision-making factors that experts agree are the most important in differentiating the symptoms of ASD from those of other conditions. The overarching question of this study is to explore how experts in the field of ASD evaluation use clinical judgment in the process of diagnostic decision-making. The results of this study will be used to create decision-making supports for school teams to use during assessment of students with ASD.

Think back to times in your professional career that you have received a referral for a child with suspected ASD who was ultimately determined to have another condition. During such situations, how did you use clinical judgment to support the process of differentiating ASD from other conditions?

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What symptoms of ASD are the most important to consider when using clinical judgment during diagnostic decision-making?

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End of Block: Clinical Inclusionary Criteria

Start of Block: School-Based Inclusionary Criteria

## Appendix D: Round 1 Questionnaire

1. What is your email address?
2. This questionnaire is estimated to take about 60-90 minutes to complete. If you need to take more than one session to complete this questionnaire, please note that this program does not have a save button, but rather, it will automatically save your place and responses. You can click on the link you received in the email at any time and from any device to re-access the survey right where you left off.
3. Please write as much as you would like in response to each question, and take as much time as you would like, but also know that a brief list of examples that come to mind immediately is also acceptable. As this questionnaire is designed to tap into clinical judgment, intuitive responses are preferred to answers from diagnostic texts.
4. Thank you for your time,  
  
Staci Jordan, Primary Investigator
5. The following definition will be repeated on each page:

6. Definition of “Red Flags”: Those qualitative features noticed during an evaluation that trigger one’s clinical judgment to suspect that a condition might be the cause of a student’s symptoms. These “Red Flags” may be noticed during a record review, parent or teacher interview, assessment, or student observation, but are not the direct result of any formal assessment.
7. What features of Intellectual Disability might a novice evaluator mistake for symptoms of Autism?
8. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that Intellectual Disability might actually be the cause of the child’s symptoms?
9. How would you confirm or rule out those suspicions?
10. What features of Attention Deficit Hyperactivity Disorder might a novice evaluator mistake for symptoms of Autism?
11. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that Attention Deficit Hyperactivity Disorder might actually be the cause of the child’s symptoms?

12. How would you confirm or rule out those suspicions?
13. What features of Speech Language Impairment might a novice evaluator mistake for symptoms of Autism?
14. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that Speech Language Impairment might actually be the cause of the child’s symptoms?
15. How would you confirm or rule out those suspicions?
16. What features of Intellectual Giftedness might a novice evaluator mistake for symptoms of Autism?
17. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that Intellectual Giftedness might actually be the cause of the child’s symptoms?
18. How would you confirm or rule out those suspicions?

19. What features of anxiety disorders, such as general anxiety disorder, social phobia, selective mutism, or obsessive-compulsive disorder might a novice evaluator mistake for symptoms of Autism?
20. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that anxiety disorders, such as general anxiety disorder, social phobia, selective mutism, or obsessive-compulsive disorder might actually be the cause of the child’s symptoms?
21. How would you confirm or rule out those suspicions?
22. What features of mood disorders, such as depression, disruptive mood dysregulation disorder, or bipolar disorder might a novice evaluator mistake for symptoms of Autism?
23. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that mood disorders, such as depression, disruptive mood dysregulation disorder, or bipolar disorder might actually be the cause of the child’s symptoms?
24. How would you confirm or rule out those suspicions?

25. What features of childhood onset schizophrenia might a novice evaluator mistake for symptoms of Autism?
26. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that childhood onset schizophrenia might actually be the cause of the child’s symptoms?
27. How would you confirm or rule out those suspicions?
28. What features of disorders of trauma and attachment might a novice evaluator mistake for symptoms of Autism?
29. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that a disorder of trauma and attachment might actually be the cause of the child’s symptoms?
30. How would you confirm or rule out those suspicions?
31. What features of traumatic brain injury might a novice evaluator mistake for symptoms of Autism?

32. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that traumatic brain injury might actually be the cause of the child’s symptoms?
33. How would you confirm or rule out those suspicions?
34. What features of specific learning disability, including nonverbal learning disability, might a novice evaluator mistake for symptoms of Autism?
35. After receiving a referral for a child with suspected autism, what are examples of “red flags” that might cue you to suspect that a specific learning disability, including nonverbal learning disability, might actually be the cause of the child’s symptoms?
36. How would you confirm or rule out those suspicions?



## Appendix E: Examples of Coding Procedures

### Process Coding

Scoping Question 1: Think back to times in your professional career that you have received a referral for a child with suspected ASD who was ultimately determined to have another condition. During such situations, how did you use clinical judgment to support the process of differentiating ASD from other conditions?				
Sample of Participant Responses	Initial coding	3 <sup>rd</sup> Party Feedback to check for oversimplification	Secondary Process Coding – Developing action words	Final <b>Themes</b> and codes (after additional 3 <sup>rd</sup> party feedback to check for completeness)
Clinical judgment is required in deciding whether behaviors that might be indicators of ASD are better understood as features of some other condition. For example, for some children a lack of sustained social engagement is a function of inattention and hyperactivity, rather than a deficit in social reciprocity	Differentiation from other conditions – need knowledge of alternate conditions. Need to know what to attend to	May or may not be intentional. This expert is <i>applying</i> knowledge of ASD and ADHD rather than just having it. She not only knew what to attend to, she recognizes the strength of those characteristics in different conditions	Applying knowledge of several conditions  Examining symptom crossover, fit, misfit  Attending to key characteristics	<b>Knowledge and experience</b> Applying knowledge of several conditions to examine symptom crossover, fit, and mis-fit  Recognizing the influence and strength of key characteristics
I use my clinical judgment to determine whether the quality of the social interactions was consistent with ASD or more consistent with another diagnosis	Knowing about several conditions and how those feel to interact with. Differentiation	3 <sup>rd</sup> party agreed with code	Applying knowledge of several conditions  Examining symptom crossover, fit, misfit  Attending to the quality/feeling of interactions	<b>Knowledge and Experience</b> Applying knowledge of several conditions to examine symptom crossover, fit, and mis-fit.  <b>Cognitive Processes</b> Noticing the personal qualitative experience of working with the child
Combination of formal assessment, observations, and clinical judgment. For example, differentiating between ASD, ADHD, anxiety, language disorders, etc. Specifically, children with language disorders typically do not demonstrate repetitive behaviors or restricted interests and their play is like the play of typically developing children	Knowing about several conditions, integrating data, noticing symptom presentation and whether it fits with one condition or another	3 <sup>rd</sup> party agreed with code	Applying knowledge of several conditions,  Examining symptom crossover, fit, and mis-fit  Attending to key characteristics	<b>Knowledge and experience</b> Applying knowledge of several conditions to examine symptom crossover, fit, and mis-fit  Recognizing the influence and strength of key characteristics

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## Structural Coding

Question: <i>What features of mood disorders, such as depression, disruptive mood dysregulation disorder, or bipolar disorder might a novice evaluator mistake for symptoms of autism?</i>		
Sample of Participant Responses	Initial Codes	Final Code
Inability to adjust behavior	Difficulty adjusting behavior	Poor emotional and behavioral regulation
Behavior difficulty across settings	Behavior difficulty across settings	
Difficulty with emotional regulation	Poor emotional regulation	
Question: After receiving a referral for a child with suspected autism, what are examples of red flags that might cue you to suspect that Intellectual Giftedness might actually be the cause of the child's symptoms?		
Sample of Participant Responses	Initial Codes	Final Code
Communicates and interacts well with adults	Good communication and interaction with adults	Intact social skills and reciprocity with adults
Good ability to converse with adults in a socially appropriate manner about their interest areas	Good communication and social skills with adults	
Reciprocity appears to be intact though child may prefer spending time with adults	Good social reciprocity with adults Prefers adults	
Social interest in conversation - May prefer adults	Interest in conversation with adults	

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## Appendix F: Round 2 Questionnaire

What is your email address?

In this round, you will be asked to review the group's answers to the questions from both the *Scoping* and Round 1 questionnaires and rate their importance to the process of using clinical judgment to differentiate autism from other conditions.

The first question presented to the group was regarding how clinical judgment is used in the process of differentiating ASD from other conditions. From your responses, 5 categories and several concepts were developed. Please review the group's responses and the percentage of respondents who listed each concept in their answer.

Category 1: Assessment Practices: Please rate whether you AGREE or DISAGREE that the concept is important to the process of using clinical judgment in differential decision-making.

	Agree	Disagree
Integrating and comparing/contrasting formal and informal test data (42%)	<input type="radio"/>	<input type="radio"/>
Delving into early development and past experiences through interviews and record review (42%)	<input type="radio"/>	<input type="radio"/>

Observing in multiple environments (37%)	<input type="radio"/>	<input type="radio"/>
Looking at the consistency of behaviors across contexts and throughout time (21%)	<input type="radio"/>	<input type="radio"/>
Selecting and cross-checking with diagnostic tests (16%)	<input type="radio"/>	<input type="radio"/>

Category 2: Cognitive processes: Please rate whether you AGREE or DISAGREE that the concept is important to the process of using clinical judgment in differential decision-making.

	Agree	Disagree
Considering biases and preconceptions (16%)	<input type="radio"/>	<input type="radio"/>
Keeping an open mind at the outset and letting data guide decision-making (11%)	<input type="radio"/>	<input type="radio"/>
Understanding that standardized assessments alone aren't enough to be accurate (11%)	<input type="radio"/>	<input type="radio"/>
Using the DSM-V as a starting point to guide decision-making (11%)	<input type="radio"/>	<input type="radio"/>
Detecting struggle to make things fit into a certain category leads to	<input type="radio"/>	<input type="radio"/>

consideration of different possibilities (5%)

Category 3: Experience and Knowledge: Please rate whether you AGREE or DISAGREE that the concept is important to the process of using clinical judgment in differential decision-making.

	Agree	Disagree
Applying knowledge of several conditions to analyze symptom crossover, fit, and mis-fit (79%)	<input type="radio"/>	<input type="radio"/>
Linking past experiences/knowledge to current case (37%)	<input type="radio"/>	<input type="radio"/>
Recognizing the influence and strength of key characteristics (5%)	<input type="radio"/>	<input type="radio"/>

Category 4: Personal Feelings: Please rate whether you AGREE or DISAGREE that the concept is important to the process of using clinical judgment in differential decision-making.

	Agree	Disagree
Noticing the personal qualitative experience of working with the child (16%)	<input type="radio"/>	<input type="radio"/>

Category 5: Consultation and Collaboration : Please rate whether you AGREE or DISAGREE that the concept is important to the process of using clinical judgment in differential decision-making.

	Agree	Disagree
Utilizing a transdisciplinary assessment and data analysis approach (11%)	<input type="radio"/>	<input type="radio"/>
Consulting with other experts (5%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statements or have anything else to add about how you recognize autism, please discuss your reasoning here (optional)

The next question presented to the group asked what characteristics of autism are most important when using clinical judgment to differentiate autism from other conditions during. In essence, what stands out most about a child and creates a pattern that you recognize as autism?

Please review the groups' responses and percentage of the group who responded with each characteristic, and rate whether you AGREE or DISAGREE that the characteristic is

an important part of a pattern that triggers your clinical judgment to differentiate autism from other conditions.

Quality of Social Engagement (68% of respondents referenced some form of quality of social engagement in their responses)

	Agree	Disagree
Limited social reciprocity (32%)	<input type="radio"/>	<input type="radio"/>
Unusual/poor quality of social engagement (21%)	<input type="radio"/>	<input type="radio"/>
Lack of spontaneous social engagement (16%)	<input type="radio"/>	<input type="radio"/>
Limited desire to share/socially connect with others (16%)	<input type="radio"/>	<input type="radio"/>
Poor or atypical response to social overtures (16%)	<input type="radio"/>	<input type="radio"/>
Difficulty engaging in joint attention with others (5%)	<input type="radio"/>	<input type="radio"/>
Integration of social behaviors (5%)	<input type="radio"/>	<input type="radio"/>
Limited understanding and use of social microbehaviors (5%)	<input type="radio"/>	<input type="radio"/>
Atypical eye contact (5%)	<input type="radio"/>	<input type="radio"/>

Communication (58% of respondents referenced some form of communication in their responses)

	Agree	Disagree
Atypical social communication (37%)	<input type="radio"/>	<input type="radio"/>
Poor integration and use of nonverbal with verbal behavior (26%)	<input type="radio"/>	<input type="radio"/>
Stereotyped/repetitive language (11%)	<input type="radio"/>	<input type="radio"/>
Poor or atypical conversation skills (5%)	<input type="radio"/>	<input type="radio"/>
Atypical pragmatic language (5%)	<input type="radio"/>	<input type="radio"/>
Unusual prosody (5%)	<input type="radio"/>	<input type="radio"/>

Restricted and Repetitive Behaviors (63% of respondents referenced some form of RRB in their responses)

	Agree	Disagree
Repetitions in play, speech, and/or self-stimulatory mannerisms (63%)	<input type="radio"/>	<input type="radio"/>
Unusual, intense and restricted interests (42%)	<input type="radio"/>	<input type="radio"/>



Rigid adherence to sameness and routine (21%)

Sensory differences (16%)

Poor play and use of imagination (11%)

#### Other

Agree

Disagree

Atypicality in the course of early social, language, and sensory development (16%)

Consider continuum of symptoms within ASD severity and age (16%)

Atypical patterns of strengths and weaknesses in cognitive profile (11%)

Consider impact of intervention on symptom presentation (5%)

Consistency of ASD-related behaviors through time, across raters, and between environments (5%)

Poor ability to acclimate  
and change behavior with  
familiarity (5%)



If you strongly disagree with any statements or have anything else to add about how you recognize autism, please discuss your reasoning here (optional)

One common theme throughout the responses was that the words "odd", "unusual" or "atypical" to describe symptoms came up more for ASD, whereas the words "poor" or "limited" came up more for the other disabilities (with the exception of childhood onset schizophrenia). Please describe how you know an interaction is odd/unusual/atypical vs. poor/limited.

The next group of questions asked participants to reflect on traits of different disabilities that may appear during an evaluation process and that a novice might confuse for a symptom of autism.

Please review the following statements that participants responded are traits of different conditions that novices might confuse for symptoms of autism as well as the percentage of respondents who listed each trait.

Mark AGREE if you agree for all traits you believe may present in children with **Specific Learning Disability (SLD)** AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with **Specific Learning Disability** and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Language Deficits (in language-based learning disabilities) (37%)	<input type="radio"/>	<input type="radio"/>
Learning/Academic/School problems (28%)	<input type="radio"/>	<input type="radio"/>
There is no evidence that Nonverbal Learning Disability is a true disability (28%)	<input type="radio"/>	<input type="radio"/>
Poor use and understanding of nonverbal communication (18%)	<input type="radio"/>	<input type="radio"/>
There are no/very few similarities between SLD and ASD (18%)	<input type="radio"/>	<input type="radio"/>
Deficits in visual-spatial reasoning (18%)	<input type="radio"/>	<input type="radio"/>
Poor abstract reasoning (18%)	<input type="radio"/>	<input type="radio"/>

Social skill deficits (18%)	<input type="radio"/>	<input type="radio"/>
Anxiety (9%)	<input type="radio"/>	<input type="radio"/>
Inattention (9%)	<input type="radio"/>	<input type="radio"/>
Inconsistent eye contact (9%)	<input type="radio"/>	<input type="radio"/>
Noncompliance (9%)	<input type="radio"/>	<input type="radio"/>
Poor perspective-taking (9%)	<input type="radio"/>	<input type="radio"/>
Poor visual-motor skills (9%)	<input type="radio"/>	<input type="radio"/>
Low auditory processing speed (9%)	<input type="radio"/>	<input type="radio"/>
Social Withdrawal (9%)	<input type="radio"/>	<input type="radio"/>
Unusual learning profile (9%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement, or if you have anything else to add about traits of specific learning disability that may be confused for those of ASD, please do so here (optional)

Mark AGREE if you agree for all traits you believe may present in children with Traumatic Brain Injury (TBI) AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with Traumatic Brain injury and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Poor social skills/social judgment (42%)	<input type="radio"/>	<input type="radio"/>
Impulsivity (33%)	<input type="radio"/>	<input type="radio"/>
Attention difficulties (25%)	<input type="radio"/>	<input type="radio"/>
Emotional lability (25%)	<input type="radio"/>	<input type="radio"/>
Global delays (25%)	<input type="radio"/>	<input type="radio"/>
Speech/Language Delay (25%)	<input type="radio"/>	<input type="radio"/>
TBI does not have one classic profile/any number of symptoms may be present (25%)	<input type="radio"/>	<input type="radio"/>
Poor executive functioning (17%)	<input type="radio"/>	<input type="radio"/>
Poor skill generalization (8%)	<input type="radio"/>	<input type="radio"/>
Sensory processing dysfunction (8%)	<input type="radio"/>	<input type="radio"/>

Skill regression (8%)	<input type="radio"/>	<input type="radio"/>
Social disinhibition (8%)	<input type="radio"/>	<input type="radio"/>
Unusual profiles in any/all areas of development (motor, cognitive, speech, learning, social, behavior) (8%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement, or if you have anything else to add about traits of traumatic brain injury that may be confused for those of ASD, please do so here (optional)

Mark **AGREE** if you agree for all traits you believe may present in children with a **DISORDER OF TRAUMA AND ATTACHMENT AND** could form a pattern that could be confused for ASD.

Mark **DISAGREE** if you do not agree that the trait is associated with a **DISORDER OF TRAUMA AND ATTACHMENT** and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Behavioral/Emotional Dysregulation (54%)	<input type="radio"/>	<input type="radio"/>
Detached from people and/or the environment (54%)	<input type="radio"/>	<input type="radio"/>

Poor/inappropriate/one-sided social interactions (54%)	<input type="radio"/>	<input type="radio"/>
Limited/poor language and communication (31%)	<input type="radio"/>	<input type="radio"/>
Poor eye contact (31%)	<input type="radio"/>	<input type="radio"/>
Rigidity (31%)	<input type="radio"/>	<input type="radio"/>
Difficulty forming friendships and relationships (23%)	<input type="radio"/>	<input type="radio"/>
Fears/Anxiety (23%)	<input type="radio"/>	<input type="radio"/>
Socially indiscriminate (23%)	<input type="radio"/>	<input type="radio"/>
Lack of empathy (15%)	<input type="radio"/>	<input type="radio"/>
Restricted and repetitive interests/play (15%)	<input type="radio"/>	<input type="radio"/>
Developmental regression (8%)	<input type="radio"/>	<input type="radio"/>
Executive Dysfunction (8%)	<input type="radio"/>	<input type="radio"/>
Flattened affect (8%)	<input type="radio"/>	<input type="radio"/>
Heightened pain threshold (8%)	<input type="radio"/>	<input type="radio"/>
Inappropriate responses to common situations (8%)	<input type="radio"/>	<input type="radio"/>

Poor perspective taking (8%)	<input type="radio"/>	<input type="radio"/>
Poor understanding and expression of emotion (8%)	<input type="radio"/>	<input type="radio"/>
Reduced nonverbal communication (8%)	<input type="radio"/>	<input type="radio"/>
Reliance on routine (8%)	<input type="radio"/>	<input type="radio"/>
Self-stimulatory behaviors (8%)	<input type="radio"/>	<input type="radio"/>
Sleep disturbance (8%)	<input type="radio"/>	<input type="radio"/>
Tactile defensiveness (8%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement, or if you have anything else to add about traits of trauma and attachment disorders that may be confused for those of ASD, please do so here (optional)

Mark AGREE if you agree for all traits you believe may present in children with **CHILDHOOD ONSET SCHIZOPHRENIA** AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with **CHILDHOOD ONSET SCHIZOPHRENIA** and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.



	Agree	Disagree
Odd, unusual, and/or repetitive speech patterns may appear like echolalia, scripting, or stereotyped language/neologisms, (8% specified these behaviors may stem from hallucinations) (58%)	<input type="radio"/>	<input type="radio"/>
Odd, unusual, and/or repetitive mannerisms (50%)	<input type="radio"/>	<input type="radio"/>
Poor social interaction, may have an odd or unusual quality (50%)	<input type="radio"/>	<input type="radio"/>
Poor behavioral/emotional regulation (42%)	<input type="radio"/>	<input type="radio"/>
Social withdrawal (42%)	<input type="radio"/>	<input type="radio"/>
Appear to be in own world (33%)	<input type="radio"/>	<input type="radio"/>
Restricted/perseverative interests (25%)	<input type="radio"/>	<input type="radio"/>
Poor eye contact (17%)	<input type="radio"/>	<input type="radio"/>
Disrupted social relationships (8%)	<input type="radio"/>	<input type="radio"/>
Flat affect (8%)	<input type="radio"/>	<input type="radio"/>

Language delay (8%)	<input type="radio"/>	<input type="radio"/>
Overall skill regression (including language and social skills) (8%)	<input type="radio"/>	<input type="radio"/>
Poor adaptive skills (8%)	<input type="radio"/>	<input type="radio"/>
Poor play skills (8%)	<input type="radio"/>	<input type="radio"/>
Poor social judgment (8%)	<input type="radio"/>	<input type="radio"/>
Psychotic thought processes (8%)	<input type="radio"/>	<input type="radio"/>
Reduced nonverbal communication (8%)	<input type="radio"/>	<input type="radio"/>
Reduced verbal communication (8%)	<input type="radio"/>	<input type="radio"/>
Sleeping and eating disturbance (8%)	<input type="radio"/>	<input type="radio"/>
Unusual interests (8%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement, or if you have anything else to add about traits of childhood onset schizophrenia that may be confused for those of ASD, please do so here (optional).

Mark AGREE if you agree for all traits you believe may present in children with **Mood Disorders** (including depression, bipolar disorder, and disruptive mood dysregulation disorder) AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with **Mood**

**Disorders** (including depression, bipolar disorder, and disruptive mood dysregulation disorder) and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Demonstrates poor emotional and behavioral regulation (71%)	<input type="radio"/>	<input type="radio"/>
Lack of interest in social activities/connections (may lead to withdrawal and isolation) (71%)	<input type="radio"/>	<input type="radio"/>
Limited/poor verbal and nonverbal social response to others (43%)	<input type="radio"/>	<input type="radio"/>
Poor eye contact (29%)	<input type="radio"/>	<input type="radio"/>
Flattened affect (21%)	<input type="radio"/>	<input type="radio"/>
Difficulty sleeping/eating (14%)	<input type="radio"/>	<input type="radio"/>
Inattention (14%)	<input type="radio"/>	<input type="radio"/>
Limited interest in play and social activities, which may look like restricted interests (14%)	<input type="radio"/>	<input type="radio"/>

Poor social skills (14%)	<input type="radio"/>	<input type="radio"/>
Social disinhibition may look like unusual social overtures (bipolar disorder specific) (14%)	<input type="radio"/>	<input type="radio"/>
Difficulty attending to thoughts and interests of others/may only discuss own interests (7%)	<input type="radio"/>	<input type="radio"/>
Difficulty with transitions and schedule changes (7%)	<input type="radio"/>	<input type="radio"/>
Odd communication patterns (bipolar disorder specific) (7%)	<input type="radio"/>	<input type="radio"/>
Repetitive thoughts/conversation (7%)	<input type="radio"/>	<input type="radio"/>
Similar family history to ASD (7%)	<input type="radio"/>	<input type="radio"/>
Similar medication regime to ASD (7%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement, or if you have anything else to add about traits of mood disorders that may be confused for those of ASD, please do so here (optional)

Mark AGREE if you agree for all traits you believe may present in children with Anxiety Disorders (including selective mutism, OCD, and social anxiety) AND

could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with Anxiety Disorders (including selective mutism, OCD, and social anxiety) and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Avoidance of social situations/withdrawal/solitary play (79%)	<input type="radio"/>	<input type="radio"/>
Repetitive behaviors or fidgeting in response to anxiety and/or compulsions may be mistaken for self-stimulatory/restricted and repetitive behavior (57%)	<input type="radio"/>	<input type="radio"/>
Difficulty forming relationships/friendships (36%)	<input type="radio"/>	<input type="radio"/>
Reduced nonverbal communication/eye contact in unfamiliar situations (36%)	<input type="radio"/>	<input type="radio"/>
Reduced verbal communication in unfamiliar situations (36%)	<input type="radio"/>	<input type="radio"/>
Rigidity/insistence on things going a certain way (36%)	<input type="radio"/>	<input type="radio"/>
Poor behavioral/emotional regulation in response to normal situations (29%)	<input type="radio"/>	<input type="radio"/>

Perseverative/repetitive questioning/conversations (21%)	<input type="radio"/>	<input type="radio"/>
Preference for sameness and routine/poor response to change (21%)	<input type="radio"/>	<input type="radio"/>
Anxiety (14%)	<input type="radio"/>	<input type="radio"/>
Circumscribed/limited range of interests that may or may not be unusual in nature (14%)	<input type="radio"/>	<input type="radio"/>
Avoidance of anxiety-producing situations (7%)	<input type="radio"/>	<input type="radio"/>
Difference in presentation across settings (7%)	<input type="radio"/>	<input type="radio"/>
Fears that may be mistaken for sensory defensiveness (7%)	<input type="radio"/>	<input type="radio"/>
Overly concerned with order during play (7%)	<input type="radio"/>	<input type="radio"/>
Poor concentration (7%)	<input type="radio"/>	<input type="radio"/>
Poor sleep (7%)	<input type="radio"/>	<input type="radio"/>
Social awkwardness (7%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement, or if you have anything else to add about traits of anxiety disorders that may be confused for those of ASD, please do so here (optional)

Mark AGREE if you agree for all traits you believe may present in children with **Intellectual Giftedness** AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with Intellectual Giftedness and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Formal/Pedantic language (43%)	<input type="radio"/>	<input type="radio"/>
Prefer to engage with adults/older children (43%)	<input type="radio"/>	<input type="radio"/>
Appearance of social awkwardness (29%)	<input type="radio"/>	<input type="radio"/>
Advanced vocabulary use/may seem scripted or stereotyped (21%)	<input type="radio"/>	<input type="radio"/>
Difficulty relating to same-aged peers (may lead to rejection/withdrawal) (21%)	<input type="radio"/>	<input type="radio"/>
Ability to hyperfocus on areas of interest (14%)	<input type="radio"/>	<input type="radio"/>
Precocious reading/hyperlexia (14%)	<input type="radio"/>	<input type="radio"/>
Uneven cognitive profile/splinter skills (14%)	<input type="radio"/>	<input type="radio"/>

Difficulty shifting attention from areas of interest (7%)	<input type="radio"/>	<input type="radio"/>
Disengagement in class (7%)	<input type="radio"/>	<input type="radio"/>
One-sided conversations (7%)	<input type="radio"/>	<input type="radio"/>
Perfectionism (7%)	<input type="radio"/>	<input type="radio"/>
Poor eye contact (7%)	<input type="radio"/>	<input type="radio"/>
Precocious math (7%)	<input type="radio"/>	<input type="radio"/>
Strong memory (7%)	<input type="radio"/>	<input type="radio"/>

**Intense/perseverative areas of interest/may be unusually advanced for age was listed by 93% of participants and is "locked in"**

Please add any thoughts about how you would use clinical judgment to differentiate intense/perseverative interests that occur in intellectual giftedness from intense/perseverative interests that occur in ASD

If you strongly disagree with any statement, or if you have anything else to add about traits of intellectual giftedness that may be confused for those of ASD, please do so here (optional)



Mark AGREE if you agree for all traits you believe may present in children with **Speech and Language Impairment** AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with Speech and Language Impairment and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Expressive/receptive language delay (67%)	<input type="radio"/>	<input type="radio"/>
Poor conversation skills including difficulty answering questions (47%)	<input type="radio"/>	<input type="radio"/>
Reluctance to interact with others that develops after history of difficult communication (40%)	<input type="radio"/>	<input type="radio"/>
Imitative echolalia while learning new words (27%)	<input type="radio"/>	<input type="radio"/>
Difficulty following directions (20%)	<input type="radio"/>	<input type="radio"/>
Poor understanding of pragmatic language (20%)	<input type="radio"/>	<input type="radio"/>
Apraxia/nonverbal presentation (13%)	<input type="radio"/>	<input type="radio"/>

Poor eye contact (13%)	<input type="radio"/>	<input type="radio"/>
Reduced amount of vocalizations (13%)	<input type="radio"/>	<input type="radio"/>
Apparent delay in pretend play due to language difficulties (6%)	<input type="radio"/>	<input type="radio"/>
Difficulty requesting (6%)	<input type="radio"/>	<input type="radio"/>
Limited range of facial expressions (6%)	<input type="radio"/>	<input type="radio"/>
Moving adult's hand to show what they want mistaken for use of adult's hand as a tool (6%)	<input type="radio"/>	<input type="radio"/>
Poor articulation (6%)	<input type="radio"/>	<input type="radio"/>
Poor inference of thoughts and feelings (6%)	<input type="radio"/>	<input type="radio"/>
Poor personal space (6%)	<input type="radio"/>	<input type="radio"/>
Stuttering (6%)	<input type="radio"/>	<input type="radio"/>
Use of jargon beyond age expectations (6%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement, or if you have anything else to add about traits of intellectual disability that may be confused for those of ASD, please do so here (optional)

Mark AGREE if you agree for all traits you believe may present in children with ADHD AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with ADHD and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Poor eye contact (20% specifically stated that poor eye contact is due to inattention/hyperactivity) (53%)	<input type="radio"/>	<input type="radio"/>
Perseveration/circumscribed/restricted interests (40%)	<input type="radio"/>	<input type="radio"/>
Inattention may be confused for disengagement (33%)	<input type="radio"/>	<input type="radio"/>
Behavioral and emotional dysregulation (27%)	<input type="radio"/>	<input type="radio"/>
Difficulty maintaining back and forth on-topic conversation due to hyperactivity and inattention (20%)	<input type="radio"/>	<input type="radio"/>
Failure to respond to social cues due to distractibility and inattention (20%)	<input type="radio"/>	<input type="radio"/>
Hyperactivity/Impulsivity (20%)	<input type="radio"/>	<input type="radio"/>
Intrusive/poor boundaries (20%)	<input type="radio"/>	<input type="radio"/>

Hyperactivity/fidgeting mistaken for restricted and repetitive behaviors (13%)	<input type="radio"/>	<input type="radio"/>
Self-directed (13%)	<input type="radio"/>	<input type="radio"/>
Sensory-seeking behaviors (13%)	<input type="radio"/>	<input type="radio"/>
Peer rejection/withdrawal (6%)	<input type="radio"/>	<input type="radio"/>
Poor executive functioning (6%)	<input type="radio"/>	<input type="radio"/>
Poor nonverbal communication (6%)	<input type="radio"/>	<input type="radio"/>
Poor perspective-taking (6%)	<input type="radio"/>	<input type="radio"/>

**Poor quality of social interactions and engagement was reported by 87% of respondents and is "locked in"** (60% of respondents specifically stated that impulsive, disruptive, and hyperactive behaviors affect the quality of social interactions and engagement and 40% of respondents specifically stated that inattention and distractibility affect the quality of social interactions and engagement).

Please add any thoughts about how you would use clinical judgment to differentiate poor social interaction and engagement that occurs in ADHD from the poor social interaction and engagement that occurs in ASD

If you strongly disagree with any statement, or if you have anything else to add about traits of intellectual disability that may be confused for those of ASD, please do so here (optional)

Mark AGREE if you agree for all traits you believe may present in children with **Intellectual Disability** AND could form a pattern that could be confused for ASD.

Mark DISAGREE if you do not agree that the trait is associated with **Intellectual Disability** and/or you do not believe it would be part of a cluster of symptoms that a novice might confuse for ASD.

	Agree	Disagree
Poor social skills (53%)	<input type="radio"/>	<input type="radio"/>
Repetitive/self-stimulatory behaviors (40%)	<input type="radio"/>	<input type="radio"/>
Immature/delayed Play (33%)	<input type="radio"/>	<input type="radio"/>
Global Delays/immaturity (20%)	<input type="radio"/>	<input type="radio"/>
Limited range of interests (20%)	<input type="radio"/>	<input type="radio"/>
Poor attention/focus (13%)	<input type="radio"/>	<input type="radio"/>
Sensory processing issues (13%)	<input type="radio"/>	<input type="radio"/>

Communicative echolalia (6%)	<input type="radio"/>	<input type="radio"/>
Delayed responses (6%)	<input type="radio"/>	<input type="radio"/>
Disinterest in learning (6%)	<input type="radio"/>	<input type="radio"/>
History of milestone delay (6%)	<input type="radio"/>	<input type="radio"/>
Limited gesture use (6%)	<input type="radio"/>	<input type="radio"/>
May fail to respond to test items (6%)	<input type="radio"/>	<input type="radio"/>
Perseveration (6%)	<input type="radio"/>	<input type="radio"/>
Poor eye contact (6%)	<input type="radio"/>	<input type="radio"/>
Poor imitation (6%)	<input type="radio"/>	<input type="radio"/>
Poor social judgment (6%)	<input type="radio"/>	<input type="radio"/>
Self-injury (6%)	<input type="radio"/>	<input type="radio"/>

Poor communication was listed by 93% of respondents and is "locked in"

Please add any thoughts about how you would use clinical judgment to differentiate poor communication that occurs in intellectual disability from the poor communication that occurs in ASD

If you strongly disagree with any statement, or if you have anything else to add about traits of intellectual disability that may be confused for those of ASD, please do so here (optional)

**The next group of questions attempted to get at the essence of participants' expert intuition that allows them to cue into characteristics that differentiate ASD from other conditions. In other words, what symptoms help you to use your clinical judgment to think, "This might NOT be autism, but might actually be \_\_\_\_\_"?**

#### SPECIFIC LEARNING DISABILITY

Please review the following statements and percentage of participants who listed each in their responses.

Mark **AGREE** for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that specific learning disability, **in lieu of** ASD could be the root of a child's difficulties.

Mark **DISAGREE** if the symptom would not trigger your clinical judgment to suspect that Specific Learning Disability **in lieu of** ASD could be the root of a child's difficulties.

	Agree	Disagree
Intact verbal communication (37%)	<input type="radio"/>	<input type="radio"/>
No restricted/repetitive behaviors or stereotypies (37%)	<input type="radio"/>	<input type="radio"/>
Intact social communication (28%)	<input type="radio"/>	<input type="radio"/>
No indicators of ASD either currently or in history (28%)	<input type="radio"/>	<input type="radio"/>
Patterns of cognitive and academic performance match those observed in SLD (28%)	<input type="radio"/>	<input type="radio"/>
Appropriate play skills (18%)	<input type="radio"/>	<input type="radio"/>
Intact nonverbal communication (18%)	<input type="radio"/>	<input type="radio"/>
Response to intervention (18%)	<input type="radio"/>	<input type="radio"/>
Deficits are not consistent across settings (9%)	<input type="radio"/>	<input type="radio"/>
Can learn through imitation and observation (except in areas related to SLD) (9%)	<input type="radio"/>	<input type="radio"/>



Documented history of academic challenges (9%)

Has appropriate social interests and awareness (9%)

Has a desire to please others (9%)

Intact functioning in some areas, lack of atypical functioning in others (9%)

Lack of ASD-specific speech patterns such as echolalia, repetitive speech, odd use of words/phrases (9%)

Intact language combined with poor nonverbal conversation skills (9%)

Intact theory of mind (9%)

Intact social reciprocity (9%)

Is flexible and not attached to routines (9%)

Poor perspective taking and abstract reasoning in the absence of restricted and repetitive behaviors, and play/communication challenges (9%)

18% of participants responded with "Response to intervention". If you responded this way, please clarify.

If you strongly disagree with any statement above or have anything else to add about differentiating SLD from ASD, please do so here (optional)

### TRAUMATIC BRAIN INJURY (TBI)

Please review the following statements and percentage of participants who listed each in their responses.

**83% of participants listed History positive for TBI with evidence of typical development prior. This characteristic is "locked in"**

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that traumatic brain injury, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that Traumatic Brain Injury in lieu of ASD could be the root of a child's difficulties.

	Agree	Disagree
Atypical patterns of learning acquisition (plateaus and regressions) (17%)	<input type="radio"/>	<input type="radio"/>
Intact social relationships (8%)	<input type="radio"/>	<input type="radio"/>
Intact speech and language (8%)	<input type="radio"/>	<input type="radio"/>
Memory and attention challenges (8%)	<input type="radio"/>	<input type="radio"/>
Sensory differences linked to too much input, rather than over-interest (8%)	<input type="radio"/>	<input type="radio"/>
Social immaturity (8%)	<input type="radio"/>	<input type="radio"/>
Symptoms of ASD lack consistency (8%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement above or have anything else to add about differentiating TBI from ASD, please do so here (optional)

## DISORDERS OF TRAUMA AND ATTACHMENT

Please review the following statements and percentage of participants who listed each in their responses.

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that a disorder of trauma or attachment, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that a disorder of trauma or attachment in lieu of ASD could be the root of a child's difficulties.

	Agree	Disagree
History positive for trauma/disrupted attachment (75%)	<input type="radio"/>	<input type="radio"/>
Inconsistent pattern of avoiding and seeking out interactions with others (push/pull interactions) (33%)	<input type="radio"/>	<input type="radio"/>
Positive response to treatment for trauma/attachment (25%)	<input type="radio"/>	<input type="radio"/>
Emotional and behavioral outbursts (17%)	<input type="radio"/>	<input type="radio"/>

History of parental mental health concerns (17%)	<input type="radio"/>	<input type="radio"/>
Symptoms became evident after a trauma (17%)	<input type="radio"/>	<input type="radio"/>
Demonstrates situational fears (8%)	<input type="radio"/>	<input type="radio"/>
Inconsistent patterns of avoiding/engaging with environment (8%)	<input type="radio"/>	<input type="radio"/>
Intact functioning in certain areas (8%)	<input type="radio"/>	<input type="radio"/>
Lack of atypical development in certain areas (8%)	<input type="radio"/>	<input type="radio"/>
Reduced joint attention and social engagement (8%)	<input type="radio"/>	<input type="radio"/>
Reenacts trauma through play (8%)	<input type="radio"/>	<input type="radio"/>
Weak history of restricted and repetitive behaviors (8%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement above or have anything else to add about differentiating disorders of trauma and attachment from ASD, please do so here (optional)

#### CHILDHOOD ONSET SCHIZOPHRENIA

Please review the following statements and percentage of participants who listed each in their responses.

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that childhood onset schizophrenia, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that childhood onset schizophrenia in lieu of ASD could be the root of a child's difficulties.

	Agree	Disagree
Evidence of visual or auditory hallucinations (58%)	<input type="radio"/>	<input type="radio"/>
Early developmental history lacks indicators of ASD with late onset skill regression (50%)	<input type="radio"/>	<input type="radio"/>
Family history of mental illness/schizophrenia (25%)	<input type="radio"/>	<input type="radio"/>
May appear to be in own world, but can describe irrational/delusional/racing thoughts that are occurring (17%)	<input type="radio"/>	<input type="radio"/>
Behavioral patterns may be difficult to distinguish at first, but evolve over time to be more evident of schizophrenia (8%)	<input type="radio"/>	<input type="radio"/>

Compulsions, rituals, and repetitive behaviors may come and go (8%)

Erratic/inconsistent patterns of social interaction and engagement - may swing from appearing typical to appearing highly unusual (8%)

Intact language (8%)

Intact nonverbal communication skills (8%)

Poor social engagement paired with good social understanding (8%)

Poor socialization (8%)

Prefers to be alone (8%)

Presence of imaginary play (8%)

Quality of social interaction is different than observed in ASD (8%)

Violent outbursts with no identifiable trigger (8%)

If you strongly disagree with any statement above or have anything else to add about differentiating childhood onset schizophrenia from ASD, please do so here (optional)

MOOD DISORDERS (INCLUDING DEPRESSION, BIPOLAR DISORDER, AND DISRUPTIVE MOOD DYSREGULATION DISORDER)

Please review the following statements and percentage of participants who listed each in their responses.

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that mood disorders, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that mood disorders in lieu of ASD could be the root of a child's difficulties.

	Agree	Disagree
Early history negative for social communication challenges and restricted and repetitive behaviors (54%)	<input type="radio"/>	<input type="radio"/>
Has social insight and ability, but mood and behaviors interfere with interactions (31%)	<input type="radio"/>	<input type="radio"/>
Intact expressive/receptive language skills (31%)	<input type="radio"/>	<input type="radio"/>
Intact nonverbal communication skills (31%)	<input type="radio"/>	<input type="radio"/>



Family history of mood disorder (23%)

Social/communicative difficulties linked to onset of mood/behavior challenges (23%)

Clear changes in mood/behavior (may have no identifiable trigger) (15%)

Positive changes in social interaction and mood in response to interventions for mood disorder (15%)

Presentation may be inconsistent across settings (15%)

Child has a history of a difficult temperament (8%)

Child has control over emotional dysregulation (8%)

Complains or seems bothered by lack of friendships (8%)

Content of social communication okay, but may have slowed, agitated, or impulsive responses to others (8%)

Does not demonstrate self-stimulatory behaviors (8%)

Intact theory of mind (8%)

Typical cognitive profile  
(8%)



If you strongly disagree with any statement above or have anything else to add about differentiating mood disorders from ASD, please do so here (optional)

### ANXIETY DISORDERS (INCLUDING SELECTIVE MUTISM, OBSESSIVE COMPULSIVE DISORDER, AND SOCIAL ANXIETY)

Please review the following statements and percentage of participants who listed each in their responses.

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that an anxiety disorder, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that an anxiety disorder in lieu of ASD could be the root of a child's difficulties.

	Agree	Disagree
Improvement in verbal and nonverbal social communication and play with familiarity (64%)	<input type="radio"/>	<input type="radio"/>

Interest in and awareness of others' thoughts and feelings, sometimes to the point of being hyper-aware or afraid of others' judgment (43%)

Typical development in infancy and early childhood/can link onset of social difficulties to onset of anxiety (29%)

Shows intact receptive language skills (21%)

There is a ruminative quality to fears and worries (21%)

Difficulty with social interaction exists in the absence of restricted and repetitive behaviors, echolalia, or idiosyncratic language (14%)

Repetitive behavior is a response to anxiety, rather than self-reinforcing (14%)

Adaptive skills are intact with the exception of social interaction (7%)

Demonstrates good abstract thought (7%)

Has a variety of interests (7%)

Has an intact sensory system (7%)	<input type="radio"/>	<input type="radio"/>
Has limited verbalizations (7%)	<input type="radio"/>	<input type="radio"/>
Is empathetic and/or overly apologetic (7%)	<input type="radio"/>	<input type="radio"/>
Intact play and leisure (7%)	<input type="radio"/>	<input type="radio"/>
Poor eye contact (7%)	<input type="radio"/>	<input type="radio"/>
Poor functional communication (7%)	<input type="radio"/>	<input type="radio"/>
Poor social skills (7%)	<input type="radio"/>	<input type="radio"/>
Repetitive behaviors (7%)	<input type="radio"/>	<input type="radio"/>
Shows a desire to please others (7%)	<input type="radio"/>	<input type="radio"/>
Social withdrawal (7%)	<input type="radio"/>	<input type="radio"/>
Shows insight into own thoughts and feelings about anxiety behaviors (7%)	<input type="radio"/>	<input type="radio"/>
Social and communicative abilities improve with treatments for anxiety (7%)	<input type="radio"/>	<input type="radio"/>

If you strongly disagree with any statement above or have anything else to add about differentiating anxiety disorders from ASD, please do so here (optional)

## INTELLECTUAL GIFTEDNESS

Please review the following statements and percentage of participants who listed each in their responses.

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that intellectual giftedness, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that intellectual giftedness in lieu of ASD could be the root of a child's difficulties.

	Agree	Disagree
Intact social skills and reciprocity (33% specified with adults) (75%)	<input type="radio"/>	<input type="radio"/>
Interested in interaction with peers; particularly those of similar intellectual ability (67%)	<input type="radio"/>	<input type="radio"/>
Has social insight/theory of mind (42%)	<input type="radio"/>	<input type="radio"/>
Does not demonstrate repetitive motor behaviors (33%)	<input type="radio"/>	<input type="radio"/>

Prefers certain topics, but can be easily drawn into other's interests (33%)

Overall comprehension and insight are on par with decoding and math facts, rather than skill scatter (33%)

Uses appropriate pragmatic language and refrains from listing facts, even when conversing about areas of strong interest (33%)

Integration of verbal and nonverbal communication including eye contact (25%)

Early history is typical for play, reciprocity, and joint attention (17%)

Extremely high IQ (17%)

Behavioral issues exist only in select settings (7%)

Has strong interests and attempts to share them socially with others (7%)

Has typical speech patterns (no echolalia, odd use of words/phrases, etc.) (7%)

High rate of academic skill acquisition (7%)

Interests evolve over time  
(as opposed to being “stuck”  
on unusual details) (7%)

Is flexible/not rigid (7%)

No sensory issues (7%)

If you strongly disagree with any statement above or have anything else to add about differentiating intellectual giftedness from ASD, please do so here (optional).

### SPEECH AND LANGUAGE IMPAIRMENT

Please review the following statements and percentage of participants who listed each in their responses.

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that speech/language impairment, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that speech/language impairment in lieu of ASD could be the root of a child's difficulties.

	Agree	Disagree
Nonverbal compensation for language difficulties leads to relative strength in nonverbal communication (53%)	<input type="radio"/>	<input type="radio"/>
Has a variety of age-appropriate play/leisure interests (20%)	<input type="radio"/>	<input type="radio"/>
Language, even if limited, is social in nature (33%)	<input type="radio"/>	<input type="radio"/>
Shows interest in interacting with others (33%)	<input type="radio"/>	<input type="radio"/>
Language, even if limited, is not characterized by echolalia, repetitive speech, odd use of words and phrases, or pronoun errors (13%)	<input type="radio"/>	<input type="radio"/>
Maintains eye contact (13%)	<input type="radio"/>	<input type="radio"/>
No restricted or repetitive behaviors (13%)	<input type="radio"/>	<input type="radio"/>
In infancy, demonstrated typical babbling, pointing, facial expressions, eye contact (6%)	<input type="radio"/>	<input type="radio"/>
Demonstrates appropriate theory of mind (6%)	<input type="radio"/>	<input type="radio"/>
Is flexible/not rigid (6%)	<input type="radio"/>	<input type="radio"/>



If you strongly disagree with any statement above or have anything else to add about differentiating intellectual disability from ASD, please do so here (optional)

## ADHD

Please review the following statements and percentage of participants who listed each in their responses.

Mark AGREE for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that ADHD, in lieu of ASD could be the root of a child's difficulties.

Mark DISAGREE if the symptom would not trigger your clinical judgment to suspect that ADHD in lieu of ASD could be the root of a child's difficulties

	Agree	Disagree
Desire/interest in social interactions, even if not always successful (33%)	<input type="radio"/>	<input type="radio"/>
Intact communication skills (challenges that do exist are linked to hyperactivity/inattention) (33%)	<input type="radio"/>	<input type="radio"/>

Has social awareness/insight, even if he/she doesn't demonstrate them "in the moment" (27%)	<input type="radio"/>	<input type="radio"/>
Has a variety of age-appropriate interests (20%)	<input type="radio"/>	<input type="radio"/>
Appropriate social development reported in first year (13%)	<input type="radio"/>	<input type="radio"/>
Does not demonstrate repetitive mannerisms (13%)	<input type="radio"/>	<input type="radio"/>
Positive response to ADHD-specific interventions (may see increase in social appropriateness) (13%)	<input type="radio"/>	<input type="radio"/>
Presence of age appropriate pretend play (13%)	<input type="radio"/>	<input type="radio"/>
Appropriate response to visual stimuli (6%)	<input type="radio"/>	<input type="radio"/>
Flexible with changes/changes in routine (6%)	<input type="radio"/>	<input type="radio"/>
History supports ADHD diagnosis (6%)	<input type="radio"/>	<input type="radio"/>
Impulsivity (6%)	<input type="radio"/>	<input type="radio"/>
Intact eye contact (6%)	<input type="radio"/>	<input type="radio"/>
Integrates verbal with nonverbal behaviors (6%)	<input type="radio"/>	<input type="radio"/>

Overall behavioral pattern recognized as ADHD (6%)

Presence of executive functioning concerns (6%)

Sensory preferences without strong aversions (6%)

Typical speech patterns (no echolalia, unusual prosody, repetitions, odd phrasing) (6%)

**Challenges with social/play reciprocity are context-dependent and/or linked to problems with inattention and hyperactivity was listed by 80% of participants and is "locked in"**

Please describe how you know when a child's challenges with social/play reciprocity are linked to problems with inattention and hyperactivity rather than to difficulties encountered by children with ASD.

If you strongly disagree with any statement above or have anything else to add about differentiating intellectual disability from ASD, please do so here (optional)

## INTELLECTUAL DISABILITY

Please review the following statements and percentage of participants who listed each in their responses.

Mark **AGREE** for symptoms that would form a constellation that, during an evaluation for suspected ASD would trigger your clinical judgment to suspect that Intellectual Disability, **in lieu of** ASD could be the root of a child's difficulties.

Mark **DISAGREE** if the symptom would not trigger your clinical judgment to suspect that Intellectual Disability **in lieu of** ASD could be the root of a child's difficulties.

	Agree	Disagree
Evidence of cognitive/ adaptive delays in multiple areas currently or in infancy (60%)	<input type="radio"/>	<input type="radio"/>
Child has social/play interest and reciprocity (60%)	<input type="radio"/>	<input type="radio"/>
Social/play abilities appropriate for overall developmental level (60%)	<input type="radio"/>	<input type="radio"/>
Appropriate eye contact (20%)	<input type="radio"/>	<input type="radio"/>
Appropriate nonverbal communication skills (20%)	<input type="radio"/>	<input type="radio"/>

Lack of repetitive behaviors (20%)

Presence of a social smile (13%)

Slow rate of progress (13%)

Demonstrates empathy (6%)

Engages in joint attention (6%)

Engages in pretend play (6%)

Has a desire to please others (6%)

Initiates social interaction with others (6%)

Lack of ASD-Specific speech patterns such as echolalia, repetitive speech, odd use of words/phrases (6%)

Poor academic engagement (6%)

Responds to own name (6%)

There is a family history of learning/cognitive delays (6%)

If you strongly disagree with any statement above or have anything else to add about differentiating intellectual disability from ASD, please do so here (optional)

The final set of questions asked participants to describe their procedures for confirming or ruling out their suspicions during an evaluation.

Please review the following information, and percentage of respondents who listed each, and mark whether you agree or disagree that the procedure would be an important part of confirming or ruling out a suspicion for each disability during an evaluation for a child with suspected ASD.

Common Themes (defined as appearing as a response in all disability categories, and at least 40% of total responses).

Please mark Agree if you think it is an important part of all comprehensive evaluations for a child with suspected ASD and Disagree if you do not.

	Agree	Disagree
Investigation into medical, family, educational, developmental history through parent and/or teacher interview, and review of records (100% of categories, 69% of total responses)	<input type="radio"/>	<input type="radio"/>

Observations in multiple environments (100% of categories, 58% of total responses)

ADOS-2, ADI-R, or other ASD-Specific Measure (100% of categories, 43% of total responses)

The rest of the questions pertain to responses that were specific to confirming or ruling out suspicions for particular disorders. Please review the item and mark Agree or Disagree.

#### SLD-Specific Procedures

**Academic and cognitive testing was listed by 81% of respondents and is "locked in"**

	Agree	Disagree
Language testing (18%)	<input type="radio"/>	<input type="radio"/>
Assess executive functioning (9%)	<input type="radio"/>	<input type="radio"/>
Examine school records (9%)	<input type="radio"/>	<input type="radio"/>
Integrate findings of cognitive strengths and	<input type="radio"/>	<input type="radio"/>

weaknesses, social skills/insight, and general behavior to determine if there are patterns of atypical behavior (9%)

Look at progress monitoring of academic skill development over time (9%)

Neuropsychological testing (9%)

Peer comparisons (9%)

While reviewing assessment results, focus on cognitive strengths and weaknesses (9%)

### TBI-Specific Procedures

Agree

Disagree

Review medical records to confirm presence and severity of TBI (33%)

During record review and interview, focus on functioning prior to the brain injury (25%)

Neuropsychological assessment (8%)

Play assessment (8%)



Refer to/consult with a neurologist (8%)	<input type="radio"/>	<input type="radio"/>
Research the nature and location of the TBI to see if the affected areas might account for current concerns (8%)	<input type="radio"/>	<input type="radio"/>
Speech/Language Assessment (8%)	<input type="radio"/>	<input type="radio"/>

Disorders of Trauma and Attachment-Specific Procedures

	Agree	Disagree
Focus on confirming presence of trauma/neglect during record review and interviews (42%)	<input type="radio"/>	<input type="radio"/>
Focus on examining the nature and severity of the trauma during record review and interviews (8%)	<input type="radio"/>	<input type="radio"/>
Focus on responsiveness to a stable/nurturing environment (17%)	<input type="radio"/>	<input type="radio"/>
Play assessment (17%)	<input type="radio"/>	<input type="radio"/>
Student interview (17%)	<input type="radio"/>	<input type="radio"/>
During observations and interviews, focusing on approach/avoidant behaviors in	<input type="radio"/>	<input type="radio"/>

a variety of social contexts  
(8%)

Examining the  
constellation of behaviors  
(8%)

Examining the timeline of  
when the behaviors first  
occured (8%)

Focus on parental mental  
health during interviews and  
record review (8%)

Formal screening tools for  
trauma symptoms (8%)

Interviews with therapists  
(8%)

Peer comparisons (8%)

Speech/Language  
assessment (8%)

Use clinical judgment  
(8%)

### Childhood Onset Schizophrenia-Specific Procedures

Agree

Disagree

Follow the child over time to  
differentiate, as early  
differentiation may not be  
possible (20%)

Carefully examine and research the side-effects of any medications the child is on for possible contributions to hallucinations or delusions (14%)

Consult with/referral to a psychiatrist/neurologist/specialist (14%)

Examine any previous medical/genetics testing (14%)

Standardized/direct assessment of psychosis/mental status (14%)

Assess language skills (7%)

During evaluation and observation, focus on fluctuations in play, behavior, and social interactions (7%)

During history interviews, focus on family mental health (7%)

During parent interview, focus on course and timing of symptoms, as later onset of symptoms would be more indicative of schizophrenia (7%)

Interview with child with a focus on separating hallucinations/delusions from perseverative interests (7%)

Play assessment (7%)

Rule out seizures (7%)

### Mood Disorder-Specific Procedures

	Agree	Disagree
Mood/behavior-specific rating scales and standardized assessments (36%)	<input type="radio"/>	<input type="radio"/>
During interviews, record review, and observation look for development of mood symptoms over time (7%)	<input type="radio"/>	<input type="radio"/>
During observations, focus on interactions, play, and emotional regulation (7%)	<input type="radio"/>	<input type="radio"/>
During record review, focus on past treatment notes and look for evidence of clear mood episodes (7%)	<input type="radio"/>	<input type="radio"/>
Peer comparisons (7%)	<input type="radio"/>	<input type="radio"/>
Student interview (7%)	<input type="radio"/>	<input type="radio"/>

## Anxiety Disorder-Specific Procedures

	Agree	Disagree
Administer standardized interviews/rating scales to look for elevated anxiety symptoms (33%)	<input type="radio"/>	<input type="radio"/>
Observe child interacting with parent/caregiver and in very familiar settings (through 2-way mirror if possible) to see if there are changes in communication and social interaction (13%)	<input type="radio"/>	<input type="radio"/>
During parent interview, focus on social interactions at home and with familiar people (7%)	<input type="radio"/>	<input type="radio"/>
Focus on examining the consistency of symptoms across environments (7%)	<input type="radio"/>	<input type="radio"/>
Interview the child (7%)	<input type="radio"/>	<input type="radio"/>
Look carefully at sensory-related behaviors to determine if they are actually fear/compulsion-based rather than a true sensory aversion (7%)	<input type="radio"/>	<input type="radio"/>
Play assessment (7%)	<input type="radio"/>	<input type="radio"/>
Speech/Language assessment (7%)	<input type="radio"/>	<input type="radio"/>

Take time to get to know the child for more accurate results (7%)

### Intellectual Giftedness-Specific Procedures

	Agree	Disagree
IQ/Cognitive assessment to confirm giftedness (71%)	<input type="radio"/>	<input type="radio"/>
Academic assessment (13%)	<input type="radio"/>	<input type="radio"/>
Speech/Language/pragmatic assessments (13%)	<input type="radio"/>	<input type="radio"/>
During observations, focus on quality of interactions with familiar, and unfamiliar adults (7%)	<input type="radio"/>	<input type="radio"/>
During observations, focus on quality of social interactions with peers (7%)	<input type="radio"/>	<input type="radio"/>
During observations, focus on whether or not the child attempts to share his or her strong interests socially (7%)	<input type="radio"/>	<input type="radio"/>
During observations, focus on whether or not the child can pick up on subtle social cues (7%)	<input type="radio"/>	<input type="radio"/>
During observations, focus on whether or not the child is	<input type="radio"/>	<input type="radio"/>

able to shift topics to someone else's interests (7%)

During record review, focus on report cards (7%)

During record review, focus on the context during which social or behavioral concerns first developed (7%)

Look for inconsistency of social skills/behaviors across settings (7%)

Observe during peer interactions with gifted peers if possible (7%)

Play assessment (7%)

Standardized social-emotional assessments (7%)

Use clinical judgment to assess the quality of social deficits (7%)

### Speech/Language Impairment-Specific Procedures

	Agree	Disagree
Speech/language/pragmatic testing (53%)	<input type="radio"/>	<input type="radio"/>
Observe during ADOS-2 or in natural environments to look	<input type="radio"/>	<input type="radio"/>

for compensation for delayed speech using other means (20%)

Observe/assess play, including alone, with familiar caregiver, and with examiner (13%)

Assess cognitive skills to see if other areas are affected (7%)

During observations, look for eye contact, emotional responsiveness, joint attention, self-stimulatory behaviors (7%)

During parent interview, ask specifically about social interest and social behaviors during activities where language is not a hindrance (7%)

Occupational therapy evaluation (7%)

### ADHD-Specific Procedures

Agree

Disagree

Standardized assessments to look for elevated scores in hyperactivity, impulsivity, and inattention (67%)

Executive functioning assessments (13%)



Interact with the child to get a feel for the quality of social deficits (13%)	<input type="radio"/>	<input type="radio"/>
Treat for ADHD/increase structure and examine the child's response to these interventions (13%)	<input type="radio"/>	<input type="radio"/>
Administer a cognitive assessment (7%)	<input type="radio"/>	<input type="radio"/>
Administer an adaptive assessment (7%)	<input type="radio"/>	<input type="radio"/>
Language sample (7%)	<input type="radio"/>	<input type="radio"/>
Play assessment (7%)	<input type="radio"/>	<input type="radio"/>

### Intellectual Disability-Specific Procedures

**Cognitive Assessment was listed by 80% of respondents and is "locked in"**

	Agree	Disagree
Adaptive assessment (53%)	<input type="radio"/>	<input type="radio"/>
Play-based assessment/observations (20%)	<input type="radio"/>	<input type="radio"/>
Pragmatic assessment (13%)	<input type="radio"/>	<input type="radio"/>
Consider comorbidity (13%)	<input type="radio"/>	<input type="radio"/>

Compare cognitive levels to social/adaptive levels (6%)

Complete a developmental profile (6%)

Look for even vs. uneven profiles during adaptive assessment (6%)

Look for even vs. uneven profiles during cognitive assessment (6%)

Social skill assessment (6%)

If you have anything else to add about the procedures for confirming or ruling out a suspicion for any of the above disorders, please do so here.

If you have anything else to add about anything in or not in the survey, or about the study in general, please do so here.

This is the end of the survey! Pushing "next" will submit your responses.

## Appendix G: Round 3 Questionnaire

Please enter your email address

This questionnaire will present the concepts that obtained consensus during the previous survey for review.

Following those concepts that reached consensus in each category will be additional true/false questions for those concepts that did not reach consensus. Please review the concepts as interested and answer the additional open ended questions if you have any comments.

The time to complete this survey is estimated below:

Agree/Disagree statements: At an estimated 8 seconds each, these should take no more 15 minutes

Sixteen **optional** open-ended questions. At an estimated 2 minutes each, if they were all answered, would take 32 minutes

Review of concepts (**optional**): This will depend on the depth of which participants wish to review these concepts.

### **Category 1: How clinical judgment is used in the process of differentiating ASD from other conditions**

78-100% of respondents agreed with the following, which are now locked in:

- Integrating and comparing/contrasting formal and informal test data
- Delving into early development and past experiences through interviews and record review
- Understanding that standardized assessments alone aren't enough to be accurate
- Applying knowledge of several conditions to analyze symptom crossover, fit, and mis-fit
- Linking past experiences/knowledge to current case
- Observing in multiple environments
- Considering biases and preconceptions
- Looking at the consistency of behaviors across contexts and throughout time
- Keeping an open mind at the outset and letting data guide decision-making
- Recognizing the influence and strength of key characteristics
- Noticing the personal qualitative experience of working with the child
- Utilizing a transdisciplinary assessment and data analysis approach
- Consulting with other experts

50% or fewer of participants agreed with the following concept, and it will be removed:

- Detecting a struggle to make symptoms fit into a certain category leads to consideration of different possibilities (45% agreed)

The following components of the use of clinical judgment did not reach consensus in Round 2. Please check all that you agree with (if you disagree with any concept, do not check that box)

- Using the DSM-V as a starting point to guide decision-making (64% agreed in the past round)
- Selecting and cross-checking with diagnostic tests (54% agreed in the last round)

If you have any additional comments about the use of clinical judgment, please leave them here, if not, please skip to the next section.

**Category 2: The qualitative characteristics that stand out most when experts suspect a child has ASD**

78-100% of respondents agreed with the following, which are now locked in:

**Quality of social engagement**

- Limited social reciprocity
- Unusual/poor quality of social engagement
- Poor or atypical response to social overtures
- Lack of spontaneous social engagement

**Communication**

- Atypical social communication
- Atypical pragmatic language
- Poor integration and use of nonverbal with verbal behavior

**Restricted/Repetitive behaviors**

- Repetitions in play, speech, and/or self-stimulatory mannerisms
- Unusual, intense and restricted interests
- Rigid adherence to sameness and routine

**Other**

- Atypicality in the course of early social, language, and sensory development
- Consistency of ASD-related behaviors through time, across raters, and between environments

50% or fewer of participants agreed with the following concepts and they will be removed:

- Consider impact of intervention on symptom presentation (45% agreed)
- Poor ability to acclimate and change behavior with familiarity (45% agreed)

The following are qualitative characteristics that stand out most when suspecting a child has ASD did not reach consensus in Round 2. Please check all that you agree with (if you disagree with any concept, do not check that box)

- Limited desire to share/socially connect with others (73% agreed)
- Limited understanding and use of social microbehaviors (73% agreed)
- Unusual prosody (73% agreed)
- Poor play and use of imagination (73% agreed)
- Atypical conversation skills (64% agreed)
- Sensory differences (64% agreed)
- Integration of social behaviors (55% agreed)
- Atypical eye contact (55% agreed)
- Atypical patterns of strengths and weaknesses in cognitive profile (55% agreed)

Participants were asked to reflect on the terms "odd" and "unusual" (mostly used to describe the behaviors of children with ASD and schizophrenia in participant responses) and "delayed" and "limited" (mostly used to describe the behaviors of children with all other disabilities in participant responses). Here is a summary of the responses to this question. Please review the responses and add any additional comments if you have any.

Odd/Unusual	Delayed/Limited
<p>Odd and unusual behaviors are those that are distinctive and that most people would think are strange. These behaviors do not fall within the typical developmental trajectory and are not seen at any stage of a child's development. The quality of these behaviors feels overly formal, stilted, not coordinated with other modes of communication, and/or learned or rote rather than natural. Examples may include different or unusual tone, prosody, fluidity, or repetitiveness.</p>	<p>Delayed and limited behaviors are those that would be typical of a younger child, are demonstrated inconsistently, and/or seem to be in the process of developing. One example might be how a tantrum is typical of a 2-year-old, but if seen in a 13-year-old, you might say there were delays in emotional regulation.</p>

If you have any comments or anything to add about the terms odd and unusual vs. limited or delayed or about the characteristics that stand out most when suspecting a child has ASD, please enter them here. If not, skip to the next section.

### Category 3: Specific Learning Disability (SLD) AND ASD Differentiation

#### The constellation of characteristics of Specific Learning Disability (SLD) that novice evaluators may confuse for ASD

78-100% of respondents agreed with the following, which are now locked in

- Language Deficits (in language-based learning disabilities)
- Learning/Academic/School problems
- Poor abstract reasoning
- Anxiety
- Inattention
- Slow auditory processing speed
- Unusual learning profile

50% or fewer of participants agreed with the following concepts and they will be removed:

- There is no evidence that Nonverbal Learning Disability is a true disability (27% agreed)
- There are no/very few similarities between SLD and ASD (27% agreed)
- Poor use and understanding of nonverbal communication (45% agreed)
- Social skill deficits (36% agreed)
- Inconsistent eye contact (36% agreed)
- Social withdrawal (45% agreed)

The following qualities of SLD that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with. (If you disagree with any concept, just do not check that box)

- Poor visual-motor skills (72% agreed)
- Deficits in visual-spatial reasoning (64% agreed)
- Noncompliance (64% agreed)
- Poor perspective-taking (55% agreed)

**The constellation of characteristics that would lead an expert evaluator to suspect SLD instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- No restricted/repetitive behaviors or stereotypies
- Intact social communication
- No indicators of ASD either in history
- Patterns of cognitive and academic performance match those observed in SLD
- Documented history of academic challenges
- Has appropriate social interests and awareness
- Intact social reciprocity

50% or fewer of respondents agreed with the following, which will be removed

- Response to intervention (40% agreed)
- Intact functioning in some areas, lack of atypical functioning in others (49% agreed)
- Intact language combined with poor nonverbal conversation skills (30% agreed)

The following characteristics that would lead an expert evaluator to suspect SLD instead of ASD did not reach consensus in Round 2. Please check all that you agree with and leave those you disagree with blank. **(To clarify, these are characteristics that you believe are unique to SLD and/or may appear in SLD but are not typically seen in children with ASD)**

- Appropriate play skills (70%)
- Intact nonverbal communication (70%)
- Can learn through imitation and observation except in areas related to SLD (70%)
- Has a desire to please others (70%)
- Lack of ASD-specific speech patterns such as echolalia, repetitive speech, odd use of words/phrases (70%)
- Intact theory of mind (70%)
- Is flexible and not attached to routines (70%)
- Social communicative deficits are not consistent across settings (60%)
- Intact verbal communication (60%)

If you have any further comments about SLD and ASD differentiation, please leave them here. If not, skip to the next section.



#### **Category 4: ADHD and ASD Differentiation**

##### **The constellation of characteristics of ADHD that novice evaluators may confuse for ASD**

78-100% of respondents agreed with the following, which are now locked in

- Poor eye contact due to inattention/hyperactivity
- Apparent social disengagement due to inattention
- Behavioral and emotional dysregulation
- Difficulty maintaining back and forth on-topic conversation due to hyperactivity and inattention
- Failure to respond to social cues due to distractibility and inattention
- Intrusive/poor boundaries
- Hyperactivity/fidgeting mistaken for restricted and repetitive behaviors
- Poor quality of social engagement

The following qualities of ADHD that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with. (If you disagree with any concept, just do not check that box)

- Hyperactivity/Impulsivity (72%)
- Sensory-seeking behaviors (72%)
- Peer rejection/withdrawal (72%)
- Poor executive functioning (72%)
- Poor nonverbal reasoning (72%)
- Perseveration/circumscribed or restricted interests in general (64%)
- Poor perspective taking (64%)
- Self-directed behaviors (55%)
- Perseveration/restricted interests specific to video games only (new addition added in comments section of last questionnaire)

Poor Quality of Social Engagement obtained consensus in Round 1 as a characteristic of ADHD that a novice evaluator may confuse for a symptom of ASD. In Round 2, participants were asked to dig a little deeper into differentiating the poor quality of social engagement that occurs in ADHD from that which occurs in ASD. Following is a summary of participant responses. Please review and add comments if you have any. If not, you can skip to the next question.

Poor Social Interaction and Engagement of ADHD	Poor Social Interaction and Engagement of ASD
<p>Children with ADHD feel easier to connect with. For instance, even if they are moving all about the room and interactions are brief, there still might be friendly back and forth banter. They respond to others in a reciprocal way (when they are paying attention) and demonstrate empathy toward others. Children with ADHD may role play appropriate social behavior well, but have difficulty in the moment. They understand social nuances in a 1:1 setting, but may miss cues in the moment. When they are highly motivated, you may see appropriate social interactions with peers.</p>	<p>Children with ASD are generally difficult or awkward to connect with. Their responses feel odd or unusual, even if the interactions are highly structured and they are focused on the interactions. You are less likely to see a positive change in how natural an interaction feels with intervention. Things like empathy and understanding social nuances and cues are lacking, even when questioned outside of a social situation.</p>

If you have any comments or anything to add about the above table, please enter them here. If not, skip to the next section.

**The constellation of characteristics that would lead an expert evaluator to suspect ADHD instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- Challenges with communication that do exist are linked to hyperactivity/inattention
- Has social awareness/insight, even if he/she doesn't demonstrate them in the moment
- Has a variety of age-appropriate interests
- Appropriate social development reported in first year
- Does not demonstrate repetitive mannerisms
- Positive response to ADHD-specific interventions (may see increase in social appropriateness)
- Presence of age appropriate pretend play
- History supports ADHD diagnosis
- Integrates verbal with nonverbal behaviors
- Overall behavioral pattern recognized as ADHD
- Typical speech patterns (no echolalia, unusual prosody, repetitions, odd phrasing)
- Flexible with changes/changes in routine
- Desire/interest in social interactions, even if not always successful
- Intact eye contact
- Challenges with social play/reciprocity are context-dependent and can be linked to problems with inattention and hyperactivity

50% or fewer of respondents agreed with the following, so they will be removed

- Presence of executive functioning concerns (44%)
- Sensory preferences without strong aversions (44%)

The following characteristics that would lead an expert evaluator to suspect ADHD instead of ASD did not reach consensus in Round 2. Please check all that you agree with. **(To clarify, these are characteristics that you believe are unique to ADHD and/or may appear in children with ADHD but are not typically seen in children with ASD)**

- Presence of executive functioning concerns (44%)
- Sensory preferences without strong aversions (44%)

*"Challenges with social and play reciprocity are context dependent and/or linked to problems with hyperactivity and inattention obtained"* was a trait that obtained consensus in Round 1 as a something that would lead an expert evaluator to suspect ADHD instead of ASD. In Round 2, participants were asked to dig a little deeper into differentiating the context-dependent challenges in play and social reciprocity of ADHD from those

challenges that occur in ASD. Following is a summary of participant responses. Please review and add comments if you have any. If not, you can skip to the next question.

<b>Context-dependent challenges with social and play reciprocity of ADHD</b>	<b>Consistent challenges with social play and reciprocity of ASD</b>
Children with ADHD have a desire and interest to interact with others and will generally initiate social interactions with peers. These interactions may start off well, but the child with ADHD may drift off or engage in inappropriate behaviors after some time. These inappropriate behaviors such as interruptions and impulsivity may lead to peer rejection. Further, not focusing on the words or actions of others may lead to misunderstandings. Due to this rejection, children with ADHD may react negatively, withdrawal, or try to get a “rise” out of a peer intentionally as a way to interact.	Children with ASD have unusual or awkward social skills, even when they are focused and attentive to the interaction. They may need play or social interactions to be the same every time and have difficulty dealing with novelty. Children with ASD may annoy peers, but it will be less other-focused and intentional and more due to self-focused behaviors.

If you have any comments about the above table, please leave them here. If not, please move on to the next section.

If you have any further comments about ADHD and ASD differentiation, please leave them here. If not, skip to the next section.

## Category 5: Intellectual Disability and ASD Differentiation

### The constellation of characteristics of INTELLECTUAL DISABILITY that novice evaluators may confuse for ASD

78-100% of respondents agreed with the following, which are now locked in:

- Poor social skills
- Repetitive/self-stimulatory behaviors
- Immature/delayed play
- Global delays/immaturity
- Limited range of interests
- History of milestone delay
- Poor social judgment
- Poor attention/focus

50% or fewer of participants agreed with the following concepts and they will be removed:

- Sensory processing issues (45% agreed)
- Disinterest in learning (36% agreed)
- Poor eye contact (45% agreed)

The following qualities of INTELLECTUAL DISABILITY that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with. (If you disagree with any concept, just do not check that box)

- Echolalia that is communicative in nature (64%)
- Perseverations (64%)
- Social responses are delayed but not atypical (55%)
- Limited gesture use (55%)
- Failure to respond to test items that may be above intellectual level (55%)
- Poor imitation (55%)
- Self-Injury (55%)

Poor Communication obtained consensus in Round 1 as a characteristic of Intellectual Disability that a novice evaluator may confuse for a symptom of ASD. In Round 2, participants were asked to dig a little deeper into differentiating the poor quality of social engagement that occurs in ADHD from that which occurs in ASD. Following is a summary of participant responses. Please review and add comments if you have any. If not, you can skip to the next question.

Poor Communication of ID	Poor Communication of ASD
<p>Children with intellectual disability have delays in their communication, but they are generally not atypical communicators. Their adaptive, cognitive, and language profiles may be even and you likely won't notice a significant strength in any of those areas. Children with ID will likely demonstrate skills that you would expect to be lacking in a child with ASD including use of and response to gestures, eye contact, and facial expression. There will usually be some effort to engage with others, even if nonverbally. An examiner might also notice that it is easy to get the child to respond to social interaction.</p>	<p>Children with ASD have unusual patterns of communicative strengths and weaknesses. You might see patterns such as expressive language being higher than receptive, or a strong expressive vocabulary with difficulty applying it flexibly to social situations. There is generally a lack of nonverbal compensation for communicative difficulties. Finally, you would expect some sort of communicative <u>atypicality</u> such as odd use of words, stereotyped language, or odd tone and prosody.</p>

If you have any comments about the above table, please leave them here. If not, skip to the next section.

**The constellation of characteristics that would lead an expert evaluator to suspect INTELLECTUAL DISABILITY instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- Evidence of cognitive/ adaptive delays in multiple areas currently or in infancy
- Child has social/play interest and reciprocity
- Social/play abilities appropriate for overall developmental level
- Appropriate nonverbal communication skills
- Presence of a social smile
- Demonstrates empathy
- Engages in joint attention
- Engages in pretend play
- Has a desire to please others
- Lack of ASD-Specific speech patterns such as echolalia, repetitive speech, odd use of words/phrases
- There is a family history of learning/cognitive delays
- Appropriate eye contact
- Lack of repetitive behaviors
- Slow rate of progress/development
- Initiates social interaction with others

The following are characteristics that would lead an expert evaluator to suspect INTELLECTUAL DISABILITY (ID) instead of ASD and did not reach consensus in Round 2. Please check all that you agree with. **(To clarify, these are characteristics that you believe are unique to ID and/or may appear in children with ID but are not typically seen in children with ASD)**

- Poor academic engagement (56%)
- Responds to own name (67%)

If you have any further comments about Intellectual Disability and ASD differentiation, please leave them here. If not, skip to the next section.

**Category 6: Disorders of Trauma and Attachment and ASD Differentiation**

**The constellation of Characteristics of Disorders of Trauma and Attachment that novice evaluators may confuse for ASD**

- 77-100% of respondents agreed with the following, which are now locked in:  
Behavioral/emotional dysregulation
- Detached from people and/or the environment
- Poor/inappropriate/one-sided social interactions
- Limited/poor language and communication
- Poor eye contact
- Behavioral rigidity
- Difficulty forming friendships and relationships
- Fears/Anxiety
- Lack of empathy
- Flattened affect
- Inappropriate responses to common situations
- Poor perspective taking
- Reliance on routine
- Tactile defensiveness

50% or fewer of participants agreed with the following concept and it will be removed:

- Reduced nonverbal communication (36% agreed)

The following qualities of Disorders of Trauma and Attachment that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with.

- Socially indiscriminate behavior (72%)
- Executive Dysfunction (72%)
- Heightened pain threshold (72%)
- Poor understanding and expression of emotion (72%)
- Self-stimulatory behaviors (72%)
- Sleep disturbance (72%)
- Developmental regression (64%)
- Restricted and repetitive interests/play (55%)



**The constellation of characteristics that would lead an expert evaluator to suspect Disorders of Trauma and Attachment instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- History positive for trauma/disrupted attachment
- Inconsistent pattern of avoiding and seeking out interactions with others (push/pull interactions)
- Positive response to treatment for trauma/attachment
- Symptoms became evident after a trauma
- Reenacts trauma through play

50% or fewer of participants agreed with the following concepts and they will be removed:

- Emotional and behavioral outbursts (30%)
- Intact functioning in certain areas (50%)
- Reduced joint attention and social engagement (20%)

The following characteristics that would lead an expert evaluator to suspect Disorders of Trauma and Attachment (DTA) instead of ASD did not reach consensus in Round 2. Please check all that you agree with. **(To clarify, these are characteristics that you believe are unique to DTAs and/or may appear in children with DTAs but are not typically seen in children with ASD)**

- Demonstrates situational fears (70%)
- Lack of atypical development in certain areas (70%)
- Weak history of restricted and repetitive behaviors (70%)
- Inconsistent patterns of avoiding/engaging with environment (60%)
- History of parental mental health concerns (60%)

If you have any further comments about DTA and ASD differentiation, please leave them here. If not, skip to the next section.

## Category 7: Anxiety Disorders and ASD Differentiation

### The constellation of Characteristics of ANXIETY DISORDERS that novice evaluators may confuse for ASD

78-100% of respondents agreed with the following, which are now locked in:

- Avoidance of social situations/withdrawal/solitary play
- Repetitive behaviors or fidgeting in response to anxiety and/or compulsions may be mistaken for self-stimulatory/restricted and repetitive behavior
- Difficulty forming relationships/friendships
- Reduced nonverbal communication/eye contact in unfamiliar situations
- Reduced verbal communication in unfamiliar situations
- Rigidity/insistence on things going a certain way
- Poor behavioral/emotional regulation in response to normal situations
- Perseverative/repetitive questioning/conversations
- Preference for sameness and routine/poor response to change
- Anxiety
- Overly concerned with order during play
- Social awkwardness

50% or fewer of participants agreed with the following concept and it will be removed:

- Poor concentration

The following qualities of ANXIETY DISORDERS that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with

- Avoidance of anxiety-producing situations (72%)
- Circumscribed/limited range of interests that may or may not be unusual in nature (63%)
- Fears that may be mistaken for sensory defensiveness (63%)
- Poor sleep (63%)
- Difference in presentation across settings (54%)

**The constellation of characteristics that would lead an expert evaluator to suspect ANXIETY DISORDERS instead of ASD**

78-100% of respondents agreed with the following, which are now locked in:

- Improvement in verbal and nonverbal social communication and play with familiarity
- Interest in and awareness of others' thoughts and feelings, sometimes to the point of being hyper-aware of others' judgments
- Typical development in infancy and early childhood/can link onset of social difficulties to onset of anxiety
- Shows intact receptive language skills
- Difficulty with social interaction exists in the absence of restricted and repetitive behaviors, echolalia, or idiosyncratic language
- Repetitive behavior is a response to anxiety, rather than self-reinforcing
- Is empathetic and/or overly apologetic
- Shows insight into own thoughts and feelings about anxiety behaviors
- Social and communicative abilities improve with treatments for anxiety
- Demonstrates good abstract thought

50% or fewer of participants agreed with the following concepts and they will be removed:

- Has an intact sensory system (33% agreed)
- Has limited verbalizations (22% agreed)
- Poor eye contact (33% agreed)
- Poor functional communication (11% agreed)
- Poor social skills (22% agreed)
- Repetitive behaviors (22% agreed)
- Social withdrawal (33% agreed)

The following characteristics that would lead an expert evaluator to suspect an ANXIETY DISORDER instead of ASD did not reach consensus in Round 2. Please check all that you agree with. **(To clarify, these are characteristics that you believe are**

**unique to ANXIETY DISORDERS, and/or may appear in children with ANXIETY DISORDERS but are not typically seen in children with ASD)**

- There is a ruminative quality to fears and worries (67%)
- Adaptive skills are intact with the exception of social interaction (67%)
- Has a variety of interests (67%)
- Intact play and leisure skills (67%)
- Shows a desire to please others (67%)

If you have any further comments about Anxiety Disorder and ASD differentiation, please leave them here. If not, skip to the next section.

**Category 8: Childhood Onset Schizophrenia and ASD Differentiation The constellation of Characteristics of CHILDHOOD ONSET SCHIZOPHRENIA that novice evaluators may confuse for ASD**

78-100% of respondents agreed with the following, which are now locked in:

- Odd, unusual, and/or repetitive speech patterns may appear like echolalia, scripting, or stereotyped language/neologisms that may stem from hallucinations
- Odd, unusual, and/or repetitive mannerisms
- Poor social interaction, may have an odd or unusual quality
- Poor behavioral/emotional regulation
- Social withdrawal
- Appears to be in own world
- Restricted/perseverative interests
- Poor eye contact
- Disrupted social relationships
- Flat affect
- Poor social judgment
- Psychotic thought processes Reduced verbal communication
- Sleeping and eating disturbance
- Unusual interests

The following are qualities of **CHILDHOOD ONSET SCHIZOPHRENIA** that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with

- Language delay (63%)
- Overall skill regression (including language and social skills) (73%)
- Poor adaptive skills (73%)
- Poor play skills (54%)
- Reduced nonverbal communication (73%)

**The constellation of characteristics that would lead an expert evaluator to suspect CHILDHOOD ONSET SCHIZOPHRENIA instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- Evidence of visual or auditory hallucinations
- Early developmental history lacks indicators of ASD and skill regression happened later than with ASD
- Family history of mental illness/schizophrenia
- May appear to be in own world, but can describe irrational/delusional/racing thoughts that are occurring
- Behavioral patterns may be difficult to distinguish at first, but evolve over time to be more evident of schizophrenia
- Erratic/inconsistent patterns of social interaction and engagement - may swing from appearing typical to appearing highly unusual

50% or fewer of participants agreed with the following concepts and they will be removed:

- Intact language (50%)
- Poor socialization (20%)
- Prefers to be alone (20%)
- Violent outbursts with no identifiable trigger (40%)

The following characteristics that would lead an expert evaluator to suspect **CHILDHOOD ONSET SCHIZOPHRENIA (COS)** instead of ASD did not reach consensus in Round 2. Please check all that you agree with. **(To clarify, these are**

**characteristics that you believe are unique to COS, and/or may appear in children with COS but are not typically seen in children with ASD)**

- Compulsions, rituals, and repetitive behaviors that may come and go (60%)
- Intact nonverbal communication skills (60%)
- Poor social engagement paired with good social understanding (60%)
- Presence of imaginary play (60%)
- Quality of social interaction is different than observed in ASD (60%)

If you have any further comments about Childhood Onset Schizophrenia and ASD differentiation, please leave them here. If not, skip to the next section.

**Category 9: Mood disorder and ASD Differentiation**

**The constellation of Characteristics of MOOD DISORDER that novice evaluators may confuse for ASD**

78-100% of respondents agreed with the following, which are now locked in:

- Demonstrates poor emotional and behavioral regulation
- Lack of interest in social activities/connections (may lead to withdrawal and isolation)
- Limited/poor verbal and nonverbal social response to others
- Poor eye contact
- Flattened affect
- Difficulty sleeping/eating
- Poor social skills
- Difficulty with transitions and schedule changes

50% or fewer of participants agreed with the following concepts they it will be removed:

- Similar medication regime to ASD (45%)
- Similar family history to ASD (27%)

The following qualities of MOOD DISORDER that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with

- Limited interest in play and social activities, which may look like restricted interests (72%)
- Inattention (63%)
- Social disinhibition may look like unusual social overtures (bipolar disorder specific) (63%)
- Difficulty attending to thoughts and interests of others/may only discuss own interests (63%)
- Odd communication patterns (bipolar disorder specific) (63%)
- Repetitive thoughts/conversation (63%)

**The constellation of characteristics that would lead an expert evaluator to suspect MOOD DISORDER instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- Early history negative for social communication challenges and restricted and repetitive behaviors
- Has social insight and ability, but mood and behaviors interfere with interactions  
Intact nonverbal communication skills
- Family history of mood disorder
- Social/communicative difficulties linked to onset of mood/behavior challenges
- Positive changes in social interaction and mood in response to interventions for mood disorder
- Presentation may be inconsistent across settings
- Content of social communication okay, but may have slowed, agitated, or impulsive responses to others

50% or fewer of participants agreed with the following concepts and they will be removed:

- Child has a history of a difficult temperament (33%)
- Complains or seems bothered by lack of friendships (44%)

The following are characteristics that would lead an expert evaluator to suspect MOOD DISORDER instead of ASD did not reach consensus in Round 2. Please check all that you agree with. **(To clarify, these are characteristics that you believe are**

**unique to MOOD DISORDERS, and/or may appear in children with MOOD DISORDERS but are not typically seen in children with ASD)**

- Intact expressive/receptive language skills (70%)
- Clear changes in mood/behavior (may have no identifiable trigger (66%)
- Child has control over emotional dysregulation (55%)
- Does not demonstrate self-stimulatory behaviors (55%)
- Intact theory of mind (55%)
- Typical cognitive profile (55%)

If you have any further comments about Mood Disorder and ASD differentiation, please leave them here. If not, skip to the next section.

**Category 10: Intellectual Giftedness and ASD Differentiation**

**The constellation of characteristics of INTELLECTUAL GIFTEDNESS that novice evaluators may confuse for ASD**

78-100% of respondents agreed with the following, which are now locked in:

- Formal/Pedantic language
- Prefers to engage with adults/older children
- Appearance of social awkwardness
- Advanced vocabulary use (may seem scripted or stereotyped)
- Difficulty relating to same-aged peers (may lead to rejection/withdrawal)
- Ability to hyperfocus on areas of interest
- Perfectionism

50% or fewer of participants agreed with the following concept and it will be removed:

- Poor eye contact (36% agreed)



The following qualities of INTELLECTUAL GIFTEDNESS that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with

- Precocious reading/hyperlexia (73%)
- Uneven cognitive profile/splinter skills (64%)
- Difficulty shifting attention from areas of interest (64%)
- Disengagement in class (73%)
- One-sided conversations (73%)
- Precocious math skills (64%)
- Strong memory (73%)

Intense or perseverative interests that may be unusually advanced for one's age obtained consensus in Round 1 as a characteristic of intellectual giftedness that a novice evaluator may confuse for a symptom of ASD. In Round 2, participants were asked to dig a little deeper into differentiating the intense and perseverative interests that occur in IG from those that occur in ASD. Following is a summary of participant responses. Please review and add comments if you have any. If not, you can skip to the next question.

Intense and perseverative interests of IG	Intense and perseverative interests of ASD
<p>The intense and perseverative interests that may occur in children with intellectual giftedness (IG) do not lead to adaptive or social impairments. They may ask others thoughtful questions about their areas of interest, or seek out experts in the field to befriend. Children who have IG can and do show interests in other topics and can switch their interests off if it is interfering with social connections. The interests of children with IG tend to involve a greater depth of comprehension and they can fit these interests into a larger context of knowledge. These interests tend to evolve over time.</p>	<p>The intense and perseverative interests that occur in children with ASD can lead to adaptive and social impairment. Children with ASD tend to recite facts about their interests, and these interests generally do not evolve much over time. Further, children with ASD may have a more difficult time fitting their interests into a larger context of knowledge and will likely not ask others thoughtful questions about their interests. These interests that seem unusual for the child's developmental level, or in an area in which others have little interest.</p>

If you have any comments to add about the above table, please do so here. If not, skip to the next question.

**The constellation of characteristics that would lead an evaluator to suspect INTELLECTUAL GIFTEDNESS instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- Intact social skills and reciprocity with adults
- Has social insight/theory of mind
- Prefers certain topics, but can be easily drawn into others' interests
- Uses appropriate pragmatic language and refrains from listing facts, even when conversing about areas of strong interest
- Integration of verbal and nonverbal communication including eye contact
- Early history is typical for play, reciprocity, and joint attention
- Extremely high IQ
- High rate of academic skill acquisition
- Interests evolve over time (as opposed to being stuck on unusual details)
- Interested in interaction with peers; particularly those of similar intellectual ability
  
- Does not demonstrate repetitive motor behaviors
- Attempts to share strong interests with others
- Has typical speech patterns (no echolalia, odd use of words/phrases, etc.)
- Is flexible/not rigid

50% or fewer of participants agreed with the following concept and it will be removed:

- Behavioral issues exist only in select settings

The following characteristics that would lead an expert evaluator to suspect INTELLECTUAL GIFTEDNESS (IG) instead of ASD did not reach consensus in Round 2. Please check all that you agree with. (**To clarify, these are characteristics that you**

**believe are unique to IG, and/or may appear in children with IG but are not typically seen in children with ASD)**

- Overall comprehension and insight are on par with decoding and math facts, rather than skill scatter (67%)
- Does not have sensory issues (67%)

If you have any further comments about Intellectual Giftedness and ASD differentiation, please leave them here. If not, skip to the next section.

**Category 11: Speech and Language Impairment and ASD Differentiation**  
**The constellation of Characteristics of SPEECH AND LANGUAGE**  
**IMPAIRMENT that novice evaluators may confuse for ASD**

78-100% of respondents agreed with the following, which are now locked in:

- Expressive/receptive language delay
- Poor conversation skills including difficulty answering questions
- Reluctance to interact with others that develops after history of difficult communication
- Uses imitative echolalia while learning new words
- Difficulty following directions
- Poor understanding of pragmatic language
- If they have apraxia will present as nonverbal
- Reduced amount of vocalizations

50% or fewer of participants agreed with the following concepts and they will be removed:

- Poor eye contact (27% agreed)
- Limited range of facial expressions (18% agreed)
- Moving adult's hand to show what they want may be mistaken to use of another's hand as a tool (45% agreed)
- Poor articulation (45% agreed)
- Poor personal space (27% agreed)
- Stuttering (45% agreed)
- Use of jargon beyond age expectations (45% agreed)

The following qualities of SPEECH AND LANGUAGE IMPAIRMENT that a novice evaluator may confuse for ASD did not reach consensus in Round 2. Please check all that you agree with

- Apparent delay in pretend play due to language difficulties (64%)
- Difficulty requesting (64%)
- Poor ability to express inference of thoughts and feelings (55%)

**The constellation of characteristics that would lead an evaluator to suspect SPEECH AND LANGUAGE IMPAIRMENT instead of ASD**

78-100% of respondents agreed with the following, which are now locked in

- Nonverbal compensation for language difficulties leads to relative strength in nonverbal communication
- Has a variety of age-appropriate play/leisure interests
- Language, even if limited, is social in nature
- Shows interest in interacting with others
- Language, even if limited, is not characterized by echolalia, repetitive speech, odd use of words and phrases, or pronoun errors
- Maintains eye contact
- No restricted or repetitive behaviors
- Demonstrates appropriate theory of mind (when tested in a way that he/she can express it)
- Is flexible/not rigid

The following characteristic that would lead an expert evaluator to suspect SPEECH AND LANGUAGE IMPAIRMENT (SLI) instead of ASD did not reach consensus in Round 2. Please check if you agree with this statement. **(To clarify, this is a characteristics that you believe is unique to SLI, and/or may appear in children with SLI but is not typically seen in children with ASD)**

- In infancy, demonstrates typical babbling, pointing, facial expressions, eye contact (55%)

If you have any further comments about SLI and ASD differentiation, please leave them here. If not, skip to the next section.

## **Category 12: How Experts Confirm or Disprove Clinical Judgment**

**78% or more experts agreed that the following should be present in all assessments that attempt to differentiate any suspected disability from ASD and these are “locked in”:**

- Investigation into medical, family, educational, developmental history through parent and/or teacher interview, and review of records
- Observations in multiple environments
- ADOS-2, ADI-R, or other ASD-Specific Measure

### **ASD and Specific Learning Disability**

**78% or more experts agreed that the following should be present in attempts to differentiate Specific learning disability from ASD and these are “locked in”**

- Academic and cognitive testing
- Examine school records
- Integrate findings of cognitive strengths and weaknesses, social skills/insight, and general behavior to determine if there are patterns of atypical behavior
- Look at progress monitoring of academic skill development over time
- While reviewing assessment results, focus on cognitive strengths and weaknesses

**50% or fewer respondents agreed that the following are important aspects of differentiating Specific Learning Disability from ASD and they will be deleted**

- Assess executive functioning (50%)
- Neuropsychological testing (50%)
- Conduct Peer comparisons (50%)

### **ASD and Disorders of Trauma and Attachment (DTAs)**

**78% or more experts agreed that the following should be present in attempts to differentiate DTAs from ASD and these are “locked in”**

- Focus on confirming presence of trauma/neglect during record review and interviews
- Focus on examining the nature and severity of the trauma during record review and interviews
- Focus on responsiveness to a stable/nurturing environment
- Conduct a play assessment
- Conduct a student interview
- During observations and interviews, focusing on approach/avoidant behaviors in a variety of social contexts
- Examine the overall constellation of behaviors
- Examine the timeline of when the behaviors first occurred
- Use formal screening tools for trauma symptoms
- Conduct interviews with therapists

**50% or fewer respondents agreed that the following is an important aspect of differentiating DTAs from ASD and it will be deleted**

- Conduct a speech/language assessment (22%)

**51-77% of respondents agreed that the following are important aspects of differentiating ASD from DTAs and these did not reach consensus in round 2.**

**Please check all that you agree with**

- Focus on parental mental health during interviews and record review (67%)
- Use clinical judgment (67%)
- Conduct a peer comparison (56%)

### **ASD and Childhood Onset Schizophrenia (COSs)**

**78% or more experts agreed that the following should be present in attempts to differentiate COS from ASD and these are “locked in”**

- Follow the child over time to differentiate, as early differentiation may not be possible
- Carefully examine and research the side-effects of any medications the child is on for possible contributions to hallucinations or delusions
- Consult with/referral to a psychiatrist/neurologist/specialist
- Examine any previous medical/genetics testing
- Standardized/direct assessment of psychosis/mental status
- During evaluation and observation, focus on fluctuations in play, behavior, and social interactions
- During history interviews, focus on family mental health
- During parent interview, focus on course and timing of symptoms, as later onset of symptoms would be more indicative of schizophrenia
- Interview with child with a focus on separating hallucinations/delusions from perseverative interests

**51-77% of respondents agreed that the following are important aspects of differentiating ASD from COS and these did not reach consensus in round 2. Please check all that you agree with**

- Play assessment (66%)
- Assess language skills (57%)
- Rule out seizures (57%)

### **ASD and Mood Disorders**

**78% or more experts agreed that the following should be present in attempts to differentiate Mood Disorders from ASD and these are “locked in”**

Use mood/behavior-specific rating scales and standardized assessments

- During interviews, record review, and observation look for development of mood symptoms over time
- During observations, focus on interactions, play, and emotional regulation
- During record review, focus on past treatment notes and look for evidence of clear mood episodes
- Conduct a student interview

**50% or fewer respondents agreed that the following are important aspects of differentiating Mood Disorders from ASD and they will be deleted**

- Peer comparison

### **ASD and Anxiety Disorders**

**78% or more experts agreed that the following should be present in attempts to differentiate Anxiety Disorders from ASD and these are “locked in”**

- Administer standardized interviews/rating scales to look for elevated anxiety symptoms
- During parent interview, focus on social interactions at home and with familiar people
- Focus on examining the consistency of symptoms across familiar and unfamiliar environments
- Conduct a student interview
- Take time to get to know the child for more accurate results
- Conduct a play assessment
- Look carefully at sensory-related behaviors to determine if they are actually fear/compulsion-based rather than a true sensory aversion

**51-77% of respondents agreed that the following are important aspects of differentiating ASD from Anxiety Disorders and these did not reach consensus in Round 2. Please check all that you agree with**

- Observe child interacting with parent/caregiver and in very familiar settings (through 2-way mirror if possible) to see if there are changes in communication and social interaction (56%)
- Conduct or review a speech/language assessment (56%)



### **ASD and Intellectual Giftedness (IG)**

**78% or more experts agreed that the following should be present in attempts to differentiate IG from ASD and these are “locked in”**

- IQ/Cognitive assessment to confirm giftedness
- Academic assessment
- During observations, focus on quality of interactions with familiar, and unfamiliar adults
- During observations, focus on whether or not the child is able to shift topics to someone else's interests
- During observations, focus on whether or not the child attempts to share his or her strong interests socially
- During observations, focus on whether or not the child can pick up on subtle social cues
- During record review, focus on the context during which social or behavioral concerns first developed
- Observe during peer interactions with gifted peers if possible
- Use clinical judgment to assess the quality of social interactions

**50% or fewer respondents agreed that the following are important aspects of differentiating IG from ASD and they will be deleted**

- During record review, focus on report cards (44% agreed)

**51-77% of respondents agreed that the following are important aspects of differentiating ASD from IG and these did not reach consensus in Round 2. Please check all that you agree with**

- Conduct or review speech/language/pragmatic assessments (67%)
- During observations, focus on quality of social interactions with peers (67%)
- Look for inconsistency of social skills/behaviors across settings (67%)
- Use standardized social-emotional assessments (67%)

### **ASD and Speech Language Impairment (SLI)**

**78% or more experts agreed that the following should be present in attempts to differentiate SLI from ASD and these are “locked in”**

- Conduct or review speech/language/pragmatic testing
- Observe during ADOS-2 or in natural environments to look for compensation for delayed speech using other means
- Observe/assess play, including alone, with familiar caregiver, and with examiner
- During observations, look for eye contact, emotional responsiveness, joint attention, self-stimulatory behaviors
- During parent interview, ask specifically about social interest and social behaviors during activities where language is not a hindrance
- Assess cognitive skills to see if other areas are affected

**50% or fewer respondents agreed that the following are important aspects of differentiating SLI from ASD and they will be deleted**

- Conduct or consider an occupational therapy evaluation

### **ASD and Attention Deficit Hyperactivity Disorder (ADHD)**

**78% or more experts agreed that the following should be present in attempts to differentiate ADHD from ASD and these are “locked in”**

- Use standardized assessments to look for elevated scores in hyperactivity, impulsivity, and inattention
- Conduct executive functioning assessments
- Interact with the child to get a feel for the quality of social deficits
- Treat for ADHD/increase structure and note whether social skills improve under these treatments

**50% or fewer respondents agreed that the following are important aspects of differentiating ADHD from ASD and they will be deleted**

- Obtain a language sample
- Conduct a play assessment

**51-77% of respondents agreed that the following are important aspects of differentiating ASD from ADHD and these did not reach consensus in Round 2.**

**Please check all that you agree with**

- Administer a cognitive assessment (67%)
- Administer an adaptive assessment (56%)

### **ASD and Intellectual Disability (ID)**

**80% or more experts agreed that the following should be present in attempts to differentiate ID from ASD and these are “locked in”**

- Conduct an adaptive assessment
- Consider ID as a comorbid condition to ASD
- Compare cognitive levels to social/adaptive levels
- Conduct play-based assessment/observations
- Complete a developmental profile
- Look for even vs. uneven profiles during adaptive assessment
- Look for even vs. uneven profiles during cognitive assessment

**51-77% of respondents agreed that the following are important aspects of differentiating ASD from ID and these did not reach consensus during Round2.**

**Please check all that you agree with**

- Conduct a pragmatic language assessment (56%)
- Conduct a standardized social skill assessment (56%)

If you have any comments about the components of confirming or disproving clinical judgment for any disability, please list them here. If not, go to the next page to end and submit the questionnaire.

This is the end of the questionnaire. Hitting the "next" button will submit your responses. Thank you for your time!

## Appendix G: Final Product

### *Beyond Test Results: Developing Clinical Judgment to Differentiate Symptoms of Autism Spectrum Disorders from Those of Other Childhood Conditions*

#### I: Overview

Leading experts in ASD diagnosis agree that one cannot rely on test scores alone to determine whether a student's symptoms are due to ASD or another condition. Rather, it is a combination of test scores, developmental history, careful observations, and most importantly "clinical judgment" that leads to the most accurate diagnosis (Lord et al., 2006; Reaven et al., 2008; Saulnier & Ventola, 2012; Wiggins et al., 2015).

Similar terminology is used to describe the symptoms of multiple conditions, with the expectation that the examiner will be able to use his or her clinical expertise to differentiate subtle differences in presentation. Often, the difference between a problem resulting from ASD and the same problem resulting from another condition is something an expert in ASD just *knows*, but cannot quantify through formal testing.

In order to help illuminate expert decision-making processes, a group of experts in clinical and school-based ASD identification from across the United States were surveyed until they reached consensus about the process of differentiating ASD from other childhood conditions. The following decision-making support is a product of this consensus.

#### II: The Use of Clinical Judgment

Experts use clinical judgment in the process of differentiating autism spectrum disorders (ASDs) from other conditions by:

##### Assessment Practices

- Integrating and comparing/contrasting formal and informal test data
- Delving into early development and past experiences through interviews and record review

- Observing in multiple environments
- Looking at the consistency of behaviors across contexts and throughout time

### **Cognitive Processes**

- Considering biases and preconceptions
- Keeping an open mind at the outset and letting data guide decision-making
- Understanding that standardized assessments alone aren't enough to be accurate
- Using the DSM-V as a starting point to guide decision-making
- Noticing the personal qualitative experience of working with the child

### **Knowledge and Experience**

- Recognizing the influence and strength of key characteristics
- Applying knowledge of several conditions to analyze symptom crossover, fit, and mis-fit

### **Consultation and Collaboration**

- Consulting with other experts
- Utilizing a transdisciplinary assessment and data analysis approach

## **III: The Characteristics that Distinguish ASDs from Other Conditions**

Experts cue into the following constellation of characteristics when suspecting a child has an ASD. Conversely, an expert would expect to find few of the following characteristics in a child without an ASD:

Category	Characteristic
<b>Quality of social engagement</b>	<ul style="list-style-type: none"> <li>• Atypical eye contact</li> <li>• Lack of spontaneous social engagement</li> <li>• Limited desire to share or socially connect with others</li> <li>• Limited social reciprocity</li> <li>• Limited understanding and use of social microbehaviors</li> <li>• Poor or atypical response to social overtures</li> <li>• Unusual/poor quality of social engagement</li> </ul>
<b>Communication</b>	<ul style="list-style-type: none"> <li>• Atypical conversation skills</li> <li>• Atypical pragmatic language</li> <li>• Atypical social communication</li> <li>• Poor integration and use of nonverbal with verbal behavior</li> <li>• Stereotyped/repetitive language</li> <li>• Unusual prosody</li> </ul>
<b>Restricted/Repetitive behaviors</b>	<ul style="list-style-type: none"> <li>• Repetitions in play, speech, and/or self-stimulatory mannerisms</li> <li>• Poor use of imagination</li> <li>• Rigid adherence to sameness and routine</li> <li>• Unusual, intense and restricted interests</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>• Atypicality in the course of early social, language, and sensory development</li> <li>• Consistency of ASD-related behaviors through time, across raters, and between environments</li> </ul>

Digging Deeper: One thing in particular that experts attend to in the process of differentiating autism spectrum disorders from other conditions is whether a child's presentation is odd and unusual vs. delayed and limited. Following is a description of how experts differentiate odd vs. delayed characteristics.

Odd/Unusual	Delayed/Limited
Odd and unusual behaviors are those that are distinctive and that most people would think are strange. These behaviors do not fall within the typical developmental trajectory and are not seen at any stage of a child's development. The quality of these behaviors feels overly formal, stilted, not coordinated with other modes of communication, and/or learned and rote rather than natural. Examples of oddities pertaining to speech quality may include different or unusual tone, prosody, fluidity, or repetitiveness.	Delayed and limited behaviors are those that would be typical of a younger child, are demonstrated inconsistently, and/or seem to be in the process of developing. One example might be how a tantrum is typical of a 2-year-old, but if seen in a 13-year-old, you might say there were delays in emotional regulation.

#### IV: Using Clinical Judgement to Differentiate ASDs from Other Conditions

Experts use their clinical judgment to cognitively integrate the qualitative characteristics of ASD discussed above with their knowledge of several other conditions to determine whether a child has ASD. In addition to observing or not observing the constellation of characteristics listed above, an evaluator thinks about the overall presentation of a child and whether it “fits” with ASD or with an alternate condition. The following tables illustrate how experts think about the qualities of several childhood conditions as they do and do not align with those of ASD. Within each table, you will find a description of characteristics of each condition that may mimic ASD, and characteristics of each condition that experts cue into to help them determine if it is autism or said condition.

##### *Differentiating ASD and SLD*

Characteristics of SLD that may mimic ASD	Characteristics of SLD that may distinguish it from ASD
<ul style="list-style-type: none"> <li>• Anxiety</li> <li>• Inattention</li> <li>• Language deficits (in language-based learning disabilities)</li> <li>• Learning/Academic/School problems</li> <li>• Poor abstract reasoning</li> <li>• Slow auditory processing speed</li> <li>• Unusual learning profile</li> </ul>	<ul style="list-style-type: none"> <li>• Documented history of academic challenges</li> <li>• Has appropriate social interests and awareness</li> <li>• Intact social communication</li> <li>• Intact social reciprocity</li> <li>• Intact nonverbal communication</li> <li>• Lack of ASD-specific speech patterns such as echolalia, repetitive speech, odd use of words/phrases</li> <li>• No indicators of ASD either presently or in the child’s history</li> <li>• No restricted/repetitive behaviors or stereotypies</li> <li>• Patterns of cognitive and academic performance match those observed in SLD</li> </ul>

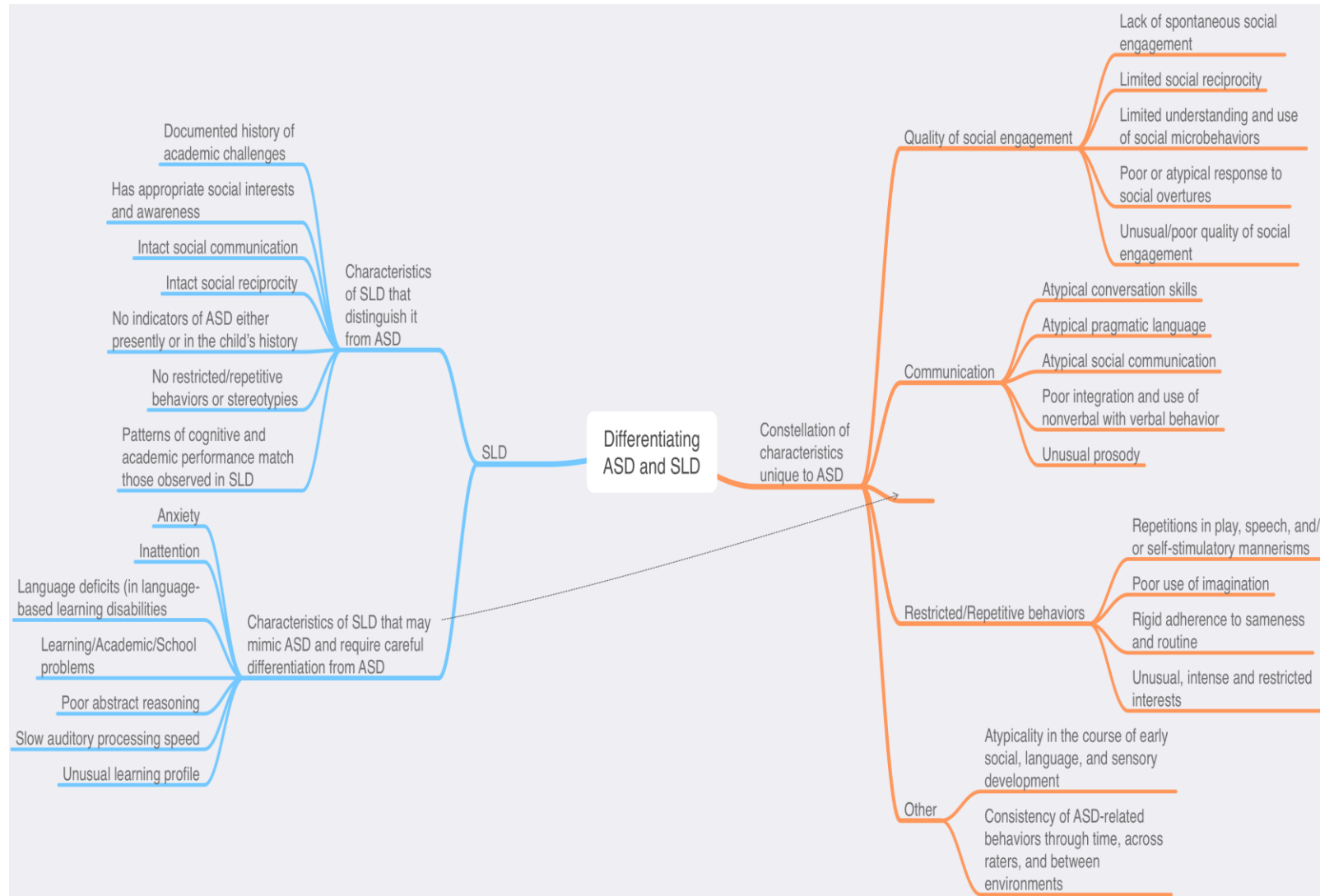


Figure 1. The process of differentiating ASD from Specific Learning Disability (SLD)



## Differentiating ASD and ADHD

Characteristics of ADHD that may mimic ASD	Characteristics of ADHD that may distinguish it from ASD
<ul style="list-style-type: none"> <li>• Apparent social disengagement due to inattention</li> <li>• Behavioral and emotional dysregulation</li> <li>• Difficulty maintaining back and forth on-topic conversation due to hyperactivity and inattention</li> <li>• Failure to respond to social cues due to distractibility and inattention</li> <li>• Hyperactivity/fidgeting mistaken for restricted and repetitive behaviors</li> <li>• Intrusive/poor boundaries</li> <li>• Peer rejection/withdrawal</li> <li>• Poor eye contact due to inattention/hyperactivity</li> <li>• Poor social interaction and engagement</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate social development reported in first year</li> <li>• Challenges with communication that do exist are linked to hyperactivity/inattention</li> <li>• Challenges with social play/reciprocity are context-dependent and can be linked to problems with inattention and hyperactivity.</li> <li>• Desire/interest in social interactions, even if not always successful</li> <li>• Does not demonstrate repetitive mannerisms</li> <li>• Flexible with changes/changes in routine</li> <li>• Has a variety of age-appropriate interests</li> <li>• Has social awareness/insight, even if he/she doesn't demonstrate them in the moment</li> <li>• History supports ADHD diagnosis</li> <li>• Intact eye contact</li> <li>• Integrates verbal with nonverbal behaviors</li> <li>• Overall behavioral pattern recognized as ADHD</li> <li>• Positive response to ADHD-specific interventions (may see increase in social appropriateness)</li> <li>• Presence of age appropriate pretend play</li> <li>• Typical speech patterns (no echolalia, unusual prosody, repetitions, odd phrasing)</li> </ul>

Digging Deeper: Poor social interaction and engagement is something experts notice in both ASD and ADHD. Following is a summary of how experts use their clinical judgment to determine if a child's poor social interaction and engagement is more likely to be attributed to challenges associated with ADHD, or to challenges associated with ASD.

<b>Poor Social Interaction and Engagement of ASD</b>	<b>Poor Social Interaction and Engagement of ADHD</b>
<p>Children with ASD are generally difficult or awkward to connect with. Their responses feel odd or unusual, even if the interactions are highly structured and they are focused on the interactions. You are less likely to see a positive change in how natural an interaction feels with intervention. Things like empathy and understanding social nuances and cues are lacking, even when outside of a social situation.</p>	<p>Children with ADHD feel easier to connect with. For instance, even if they are moving all about the room and interactions are brief, there still might be friendly back-and-forth banter. They respond to others in a reciprocal way (when they are paying attention) and demonstrate empathy toward others. Children with ADHD may role-play appropriate social behavior well, but have difficulty demonstrating it in the moment. They understand social nuances in a 1:1 setting, but may miss cues in the moment. When they are highly motivated, you may see appropriate social interactions with peers.</p>

Digging Deeper: Challenges with social and play reciprocity is something that experts might notice in both ADHD and ASD. However, experts are careful to distinguish whether these challenges are context dependent and/or linked to problems with hyperactivity and inattention. Following is a table that illustrates how experts might make this distinction.

<b>Consistent challenges with social and play reciprocity of ASD</b>	<b>Context-Dependent challenges with social and play reciprocity of ADHD</b>
<p>Children with ASD may be interested in interacting with peers. However, they have unusual or awkward social skills, even when they are focused, attentive, and interested in the interaction. Children with ASD may need play or social interactions to be the same every time and have difficulty dealing with novelty. Children with ASD may annoy peers, but it will be less other-focused/intentional, and more due to self-focused behaviors.</p>	<p>Children with ADHD have a desire and interest in interacting with others and will generally initiate social interactions with peers. These interactions may start off well, but the child with ADHD may drift off or engage in inappropriate behaviors after some time. These inappropriate behaviors such as interruptions or impulsivity may lead to peer rejection. Further, not focusing on the words or actions of others may lead to misunderstandings. Due to this rejection, children with ADHD may react negatively, withdrawal, or try to intentionally get a "rise" out of a peer as a way of interacting.</p>

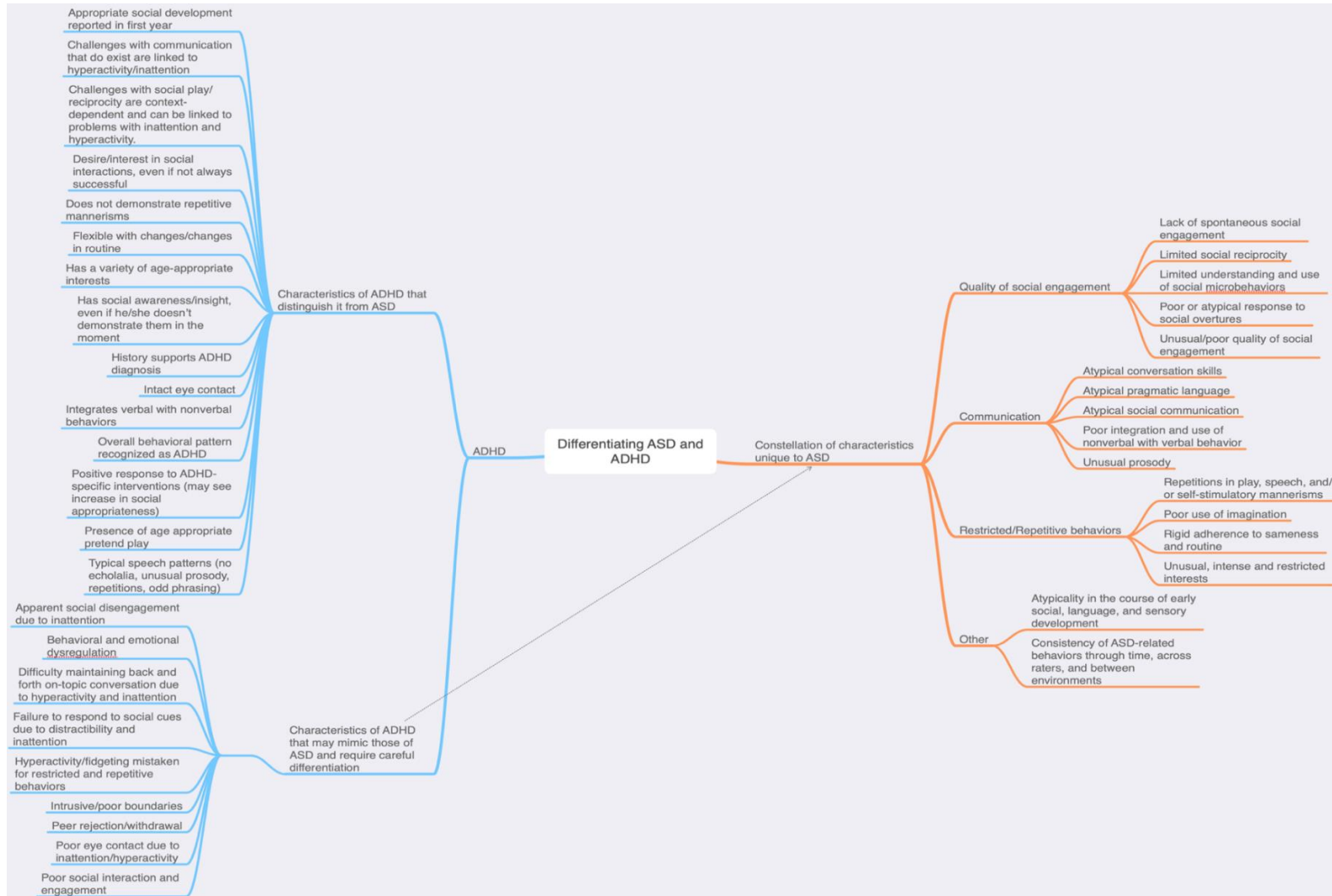


Figure 2. The process of differentiating ASD from Attention Deficit Hyperactivity Disorder (ADHD)

*Differentiating ASD and Intellectual Disability (ID)*

<b>Characteristics of ID that may mimic ASD</b>	<b>Characteristics of ID that may distinguish it from ASD</b>
<ul style="list-style-type: none"> <li>• Global delays/immaturity</li> <li>• History of milestone delay</li> <li>• Immature/delayed play</li> <li>• Limited range of interests</li> <li>• Poor attention/focus</li> <li>• Poor communication</li> <li>• Poor social judgment</li> <li>• Poor social skills</li> <li>• Repetitive/self-stimulatory behaviors</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate eye contact</li> <li>• Appropriate nonverbal communication skills</li> <li>• Child has social/play interest and reciprocity</li> <li>• Demonstrates empathy</li> <li>• Engages in joint attention</li> <li>• Engages in pretend play</li> <li>• Evidence of cognitive/ adaptive delays in multiple areas currently or in infancy</li> <li>• Has a desire to please others</li> <li>• Initiates social interaction with others</li> <li>• Lack of ASD-Specific speech patterns such as echolalia, repetitive speech, odd use of words/phrases</li> <li>• Lack of repetitive behaviors</li> <li>• Presence of a social smile</li> <li>• Slow rate of progress/development</li> <li>• Social/play abilities appropriate for overall developmental level</li> <li>• There is a family history of learning/cognitive delays</li> </ul>

Digging Deeper: Poor communication is something experts notice in both ID and ASD. Following is a summary of how experts use their clinical judgment to determine if a child's poor communication is more likely to be attributed to challenges associated with ID, or to challenges associated with ASD.

Poor Communication of ASD	Poor Communication of ID
<p>Children with ASD have unusual patterns of communicative strengths and weaknesses. You might see patterns such as expressive language being stronger than receptive, or a strong expressive vocabulary with difficulty applying it flexibly to social situations. There is generally a lack of nonverbal compensation for communicative difficulties. Finally, you would expect to see some sort of communicative atypicality such as odd use of words, stereotyped language, or odd tone and prosody.</p>	<p>Children with ID have delays in their communication, but are generally not atypical communicators. Their adaptive, cognitive, and language profiles may be even, and you likely won't notice a significant strength in any of those areas. Children with ID will likely demonstrate skills that you would expect to be lacking in a child with ASD including use of and response to gestures, eye contact, and facial expression. There will usually be some effort to engage with others, even if nonverbally. An examiner might also notice that it is easy to get the child to respond to social interaction.</p>

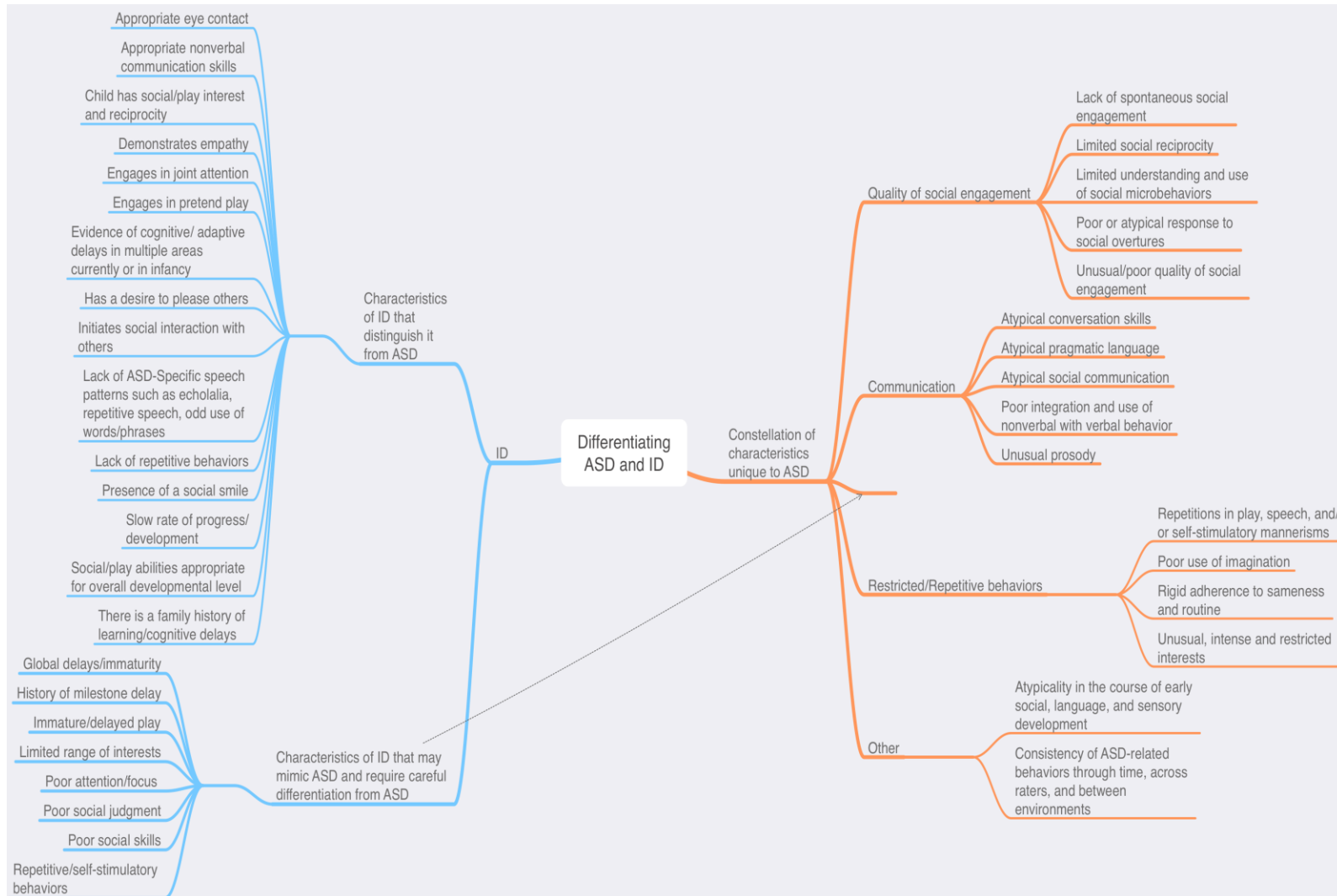


Figure 3. The process of differentiating ASD from Intellectual Disability (ID)

*Differentiating ASD and Disorders of Trauma and Attachment (DTAs)*

<b>Characteristics of DTAs that may mimic ASD</b>	<b>Characteristics of DTAs that may distinguish them from ASD</b>
<ul style="list-style-type: none"> <li>• Behavioral rigidity</li> <li>• Behavioral/emotional dysregulation</li> <li>• Detached from people and/or the environment</li> <li>• Difficulty forming friendships and relationships</li> <li>• Fears/Anxiety</li> <li>• Flattened affect</li> <li>• Inappropriate responses to common situations</li> <li>• Lack of empathy</li> <li>• Limited/poor language and communication</li> <li>• Poor eye contact</li> <li>• Poor perspective taking</li> <li>• Poor/inappropriate/one-sided social interactions</li> <li>• Poor understanding and expression of emotion</li> <li>• Reliance on routine</li> <li>• Tactile defensiveness</li> </ul>	<ul style="list-style-type: none"> <li>• History positive for trauma/disrupted attachment</li> <li>• Inconsistent pattern of avoiding and seeking out interactions with others (push/pull interactions)</li> <li>• Positive response to treatment for trauma/attachment</li> <li>• Reenacts trauma through play</li> <li>• Symptoms became evident after a trauma</li> </ul>

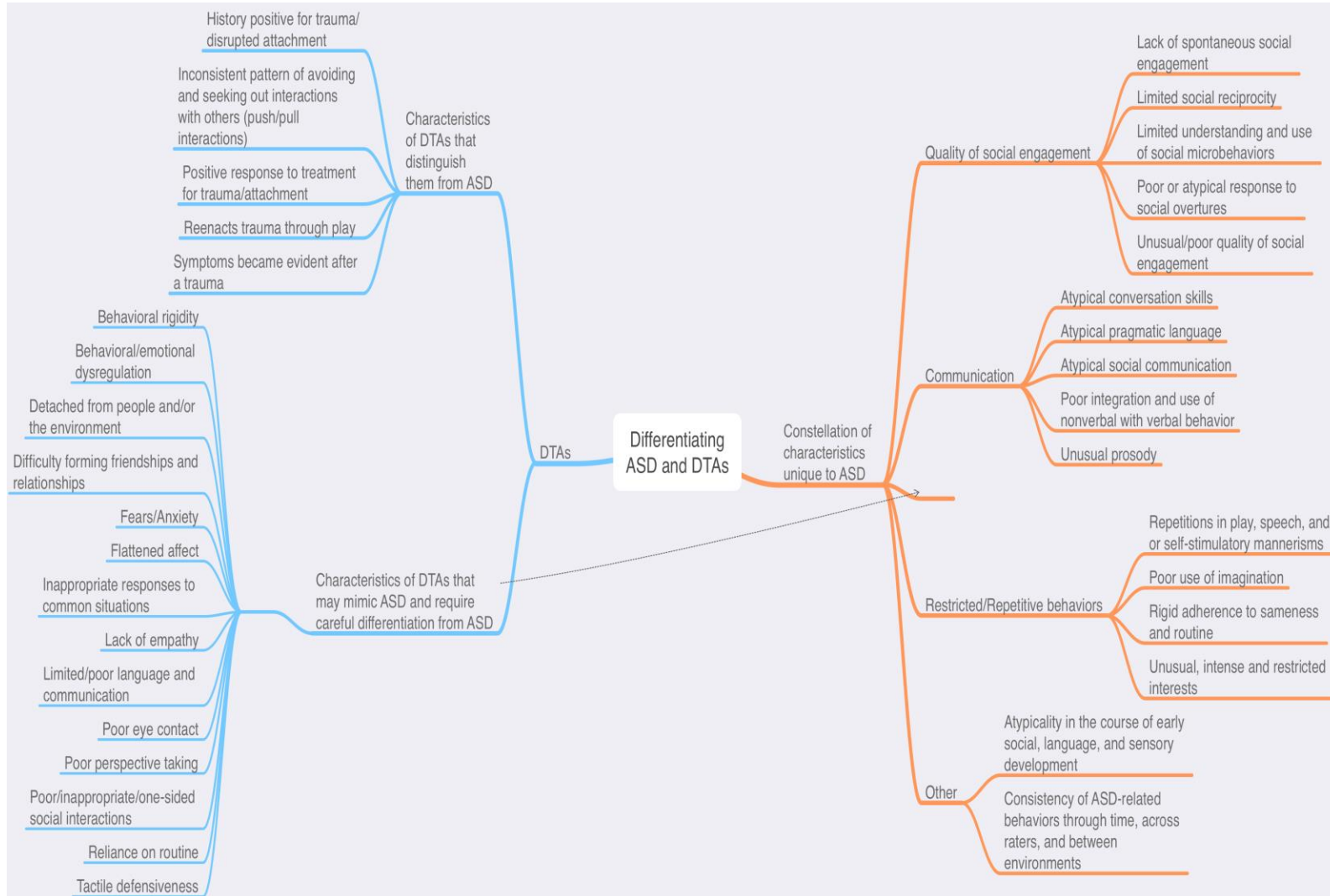


Figure 4. The process of differentiating ASD from Disorders of Trauma and Attachment (DTAs)



*Differentiating ASD and Anxiety Disorders*

<b>Characteristics of Anxiety Disorders that may mimic ASD</b>	<b>Characteristics of Anxiety Disorders that may distinguish them from ASD</b>
<ul style="list-style-type: none"> <li>• Anxiety</li> <li>• Avoidance of social situations/withdrawal/solitary play</li> <li>• Difficulty forming relationships/friendships</li> <li>• Overly concerned with order during play</li> <li>• Perseverative/repetitive questioning/conversations</li> <li>• Poor behavioral/emotional regulation in response to normal situations</li> <li>• Preference for sameness and routine/poor response to change</li> <li>• Reduced nonverbal communication/eye contact in unfamiliar situations</li> <li>• Reduced verbal communication in unfamiliar situations</li> <li>• Repetitive behaviors or fidgeting in response to anxiety and/or compulsions (may be mistaken for self-stimulatory/restricted and repetitive behavior)</li> <li>• Rigidity/insistence on things going a certain way</li> <li>• Social awkwardness</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates good abstract thought</li> <li>• Difficulty with social interaction exists in the absence of restricted and repetitive behaviors, echolalia, or idiosyncratic language</li> <li>• Improvement in verbal and nonverbal social communication and play with familiarity</li> <li>• Interest in and awareness of others' thoughts and feelings, sometimes to the point of being hyper-aware of others' judgments</li> <li>• Repetitive behavior is a response to anxiety, rather than self-reinforcing</li> <li>• Is empathetic and/or overly apologetic</li> <li>• Shows insight into own thoughts and feelings about anxiety behaviors</li> <li>• Shows intact receptive language skills</li> <li>• Social and communicative abilities improve with treatments for anxiety</li> <li>• Typical development in infancy and early childhood/can link onset of social difficulties to onset of anxiety</li> </ul>

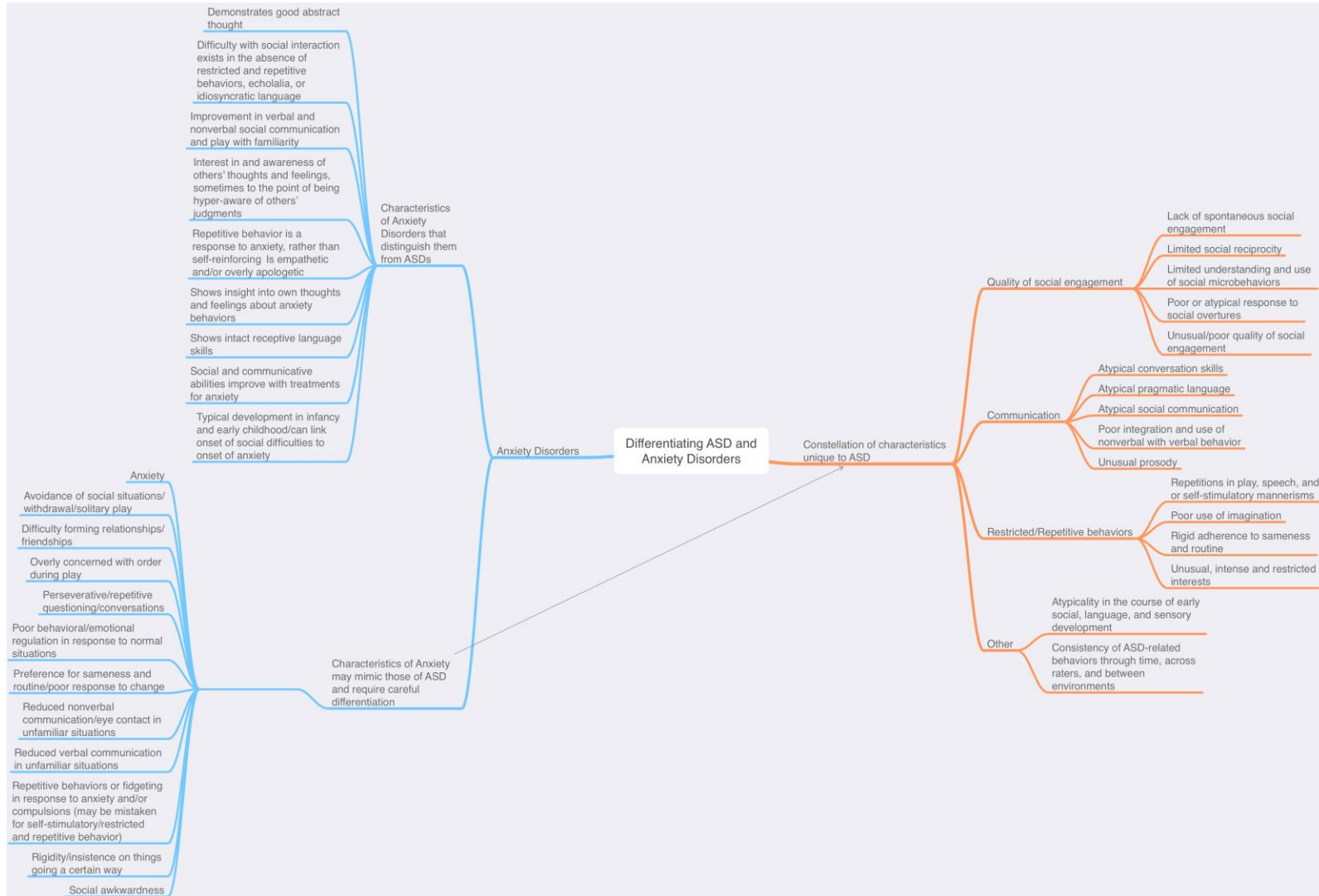


Figure 5. The process of differentiating ASD from Anxiety Disorders

*Differentiating ASD and Childhood Onset Schizophrenia (COS)*

<b>Characteristics of COS that may mimic ASD</b>	<b>Characteristics of COS that may distinguish it from ASD</b>
<ul style="list-style-type: none"> <li>• Appears to be in own world</li> <li>• Disrupted social relationships</li> <li>• Flat affect</li> <li>• Odd, unusual, and/or repetitive mannerisms</li> <li>• Odd, unusual, and/or repetitive speech patterns may appear like echolalia, scripting, or stereotyped language/neologisms and may stem from hallucinations</li> <li>• Poor behavioral/emotional regulation</li>   <li>• Poor eye contact</li> <li>• Poor social interaction, may have an odd or unusual quality</li> <li>• Poor social judgment</li> <li>• Psychotic thought processes</li> <li>• Reduced verbal communication</li> <li>• Restricted/perseverative interests</li> <li>• Sleeping and eating disturbance</li> <li>• Social withdrawal</li> <li>• Unusual interests</li> </ul>	<ul style="list-style-type: none"> <li>• Behavioral patterns may be difficult to distinguish at first, but evolve over time to be more evident of schizophrenia</li> <li>• Early developmental history lacks indicators of ASD and skill regression happened later than with ASD</li> <li>• Erratic/inconsistent patterns of social interaction and engagement - may swing from appearing typical to appearing highly unusual</li> <li>• Evidence of visual or auditory hallucinations</li> <li>• Family history of mental illness/schizophrenia</li> <li>• May appear to be in own world, but can describe irrational/delusional/racing thoughts that are occurring</li> </ul>

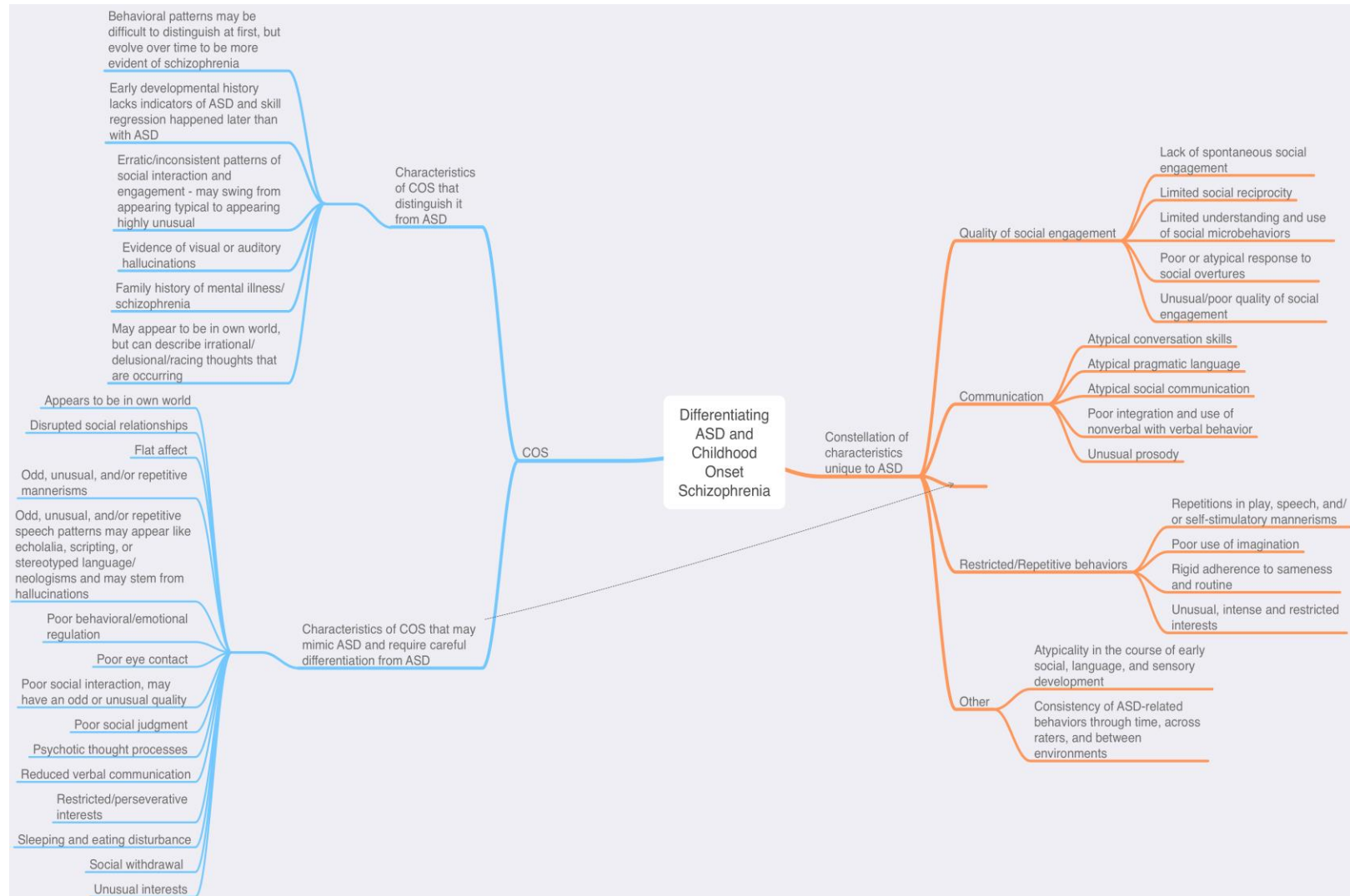


Figure 6. The process of differentiating ASD from Childhood Onset Schizophrenia

## *Differentiating ASD and Mood Disorder*

<b>Characteristics of Mood Disorder that may mimic ASD</b>	<b>Characteristics of Mood Disorder that may distinguish it from ASD</b>
<ul style="list-style-type: none"><li>• Demonstrates poor emotional and behavioral regulation</li><li>• Difficulty sleeping/eating</li><li>• Difficulty with transitions and schedule changes</li><li>• Flattened affect</li><li>• Lack of interest in social activities/connections (may lead to withdrawal and isolation)</li><li>• Limited/poor verbal and nonverbal social response to others</li><li>• Poor eye contact</li><li>• Poor social skills</li></ul>	<ul style="list-style-type: none"><li>• Clear changes in mood/behavior (may have no identifiable trigger)</li><li>• Content of social communication okay, but may have slowed, agitated, or impulsive responses to others</li><li>• Early history negative for social communication challenges and restricted and repetitive behaviors</li><li>• Family history of mood disorder</li><li>• Has social insight and ability, but mood and behaviors interfere with interactions</li><li>• Intact nonverbal communication skills</li><li>• Positive changes in social interaction and mood in response to interventions for mood disorder</li><li>• Presentation may be inconsistent across settings</li><li>• Social/communicative difficulties linked to onset of mood/behavior challenges</li></ul>

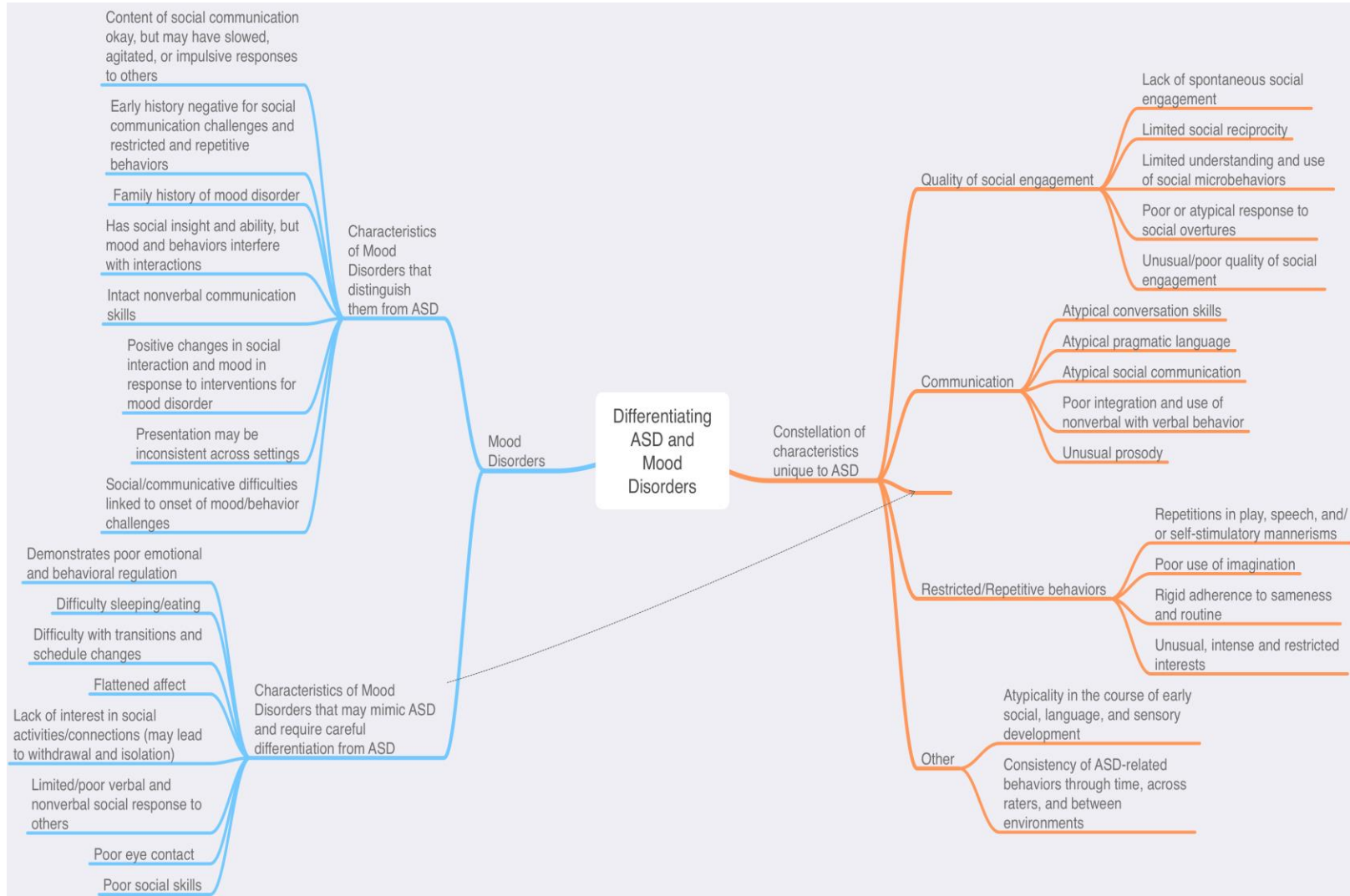


Figure 7. The process of differentiating ASD from Mood Disorder

*Differentiating ASD and Intellectual Giftedness (IG)*

<b>Characteristics of IG that may mimic ASD</b>	<b>Characteristics of IG that may distinguish it from ASD</b>
<ul style="list-style-type: none"> <li>• Ability to hyperfocus on areas of interest</li> <li>• Advanced vocabulary use (may seem scripted or stereotyped)</li> <li>• Appearance of social awkwardness</li> <li>• Difficulty relating to same-aged peers (may lead to rejection/withdrawal)</li> <li>• Formal/Pedantic language</li> <li>• Intense/perseverative areas of interest</li>   <li>• Perfectionism</li> <li>• Precocious reading/hyperlexia</li> <li>• Prefers to engage with adults/older children</li> <li>• Strong memory</li> </ul>	<ul style="list-style-type: none"> <li>• Attempts to share strong interests with others</li> <li>• Does not demonstrate repetitive motor behaviors</li> <li>• Early history is typical for play, reciprocity, and joint attention</li> <li>• Extremely high IQ</li> <li>• Has social insight/theory of mind</li> <li>• Has typical speech patterns (no echolalia, odd use of words/phrases, etc.)</li> <li>• High rate of academic skill acquisition</li> <li>• Intact social skills and reciprocity with adults</li> <li>• Integration of verbal and nonverbal communication including eye contact</li> <li>• Interested in interaction with peers; particularly those of similar intellectual ability</li> <li>• Interests evolve over time (as opposed to being stuck on unusual details)</li> <li>• Is flexible/not rigid</li> <li>• Prefers certain topics, but can be easily drawn into others' interests</li> <li>• Uses appropriate pragmatic language and refrains from listing facts, even when conversing about areas of strong interest</li> </ul>

**Digging Deeper:** Intense and perseverative interests are something experts notice in both ASD and IG. Following is a summary of how experts use their clinical judgment to determine if a child’s intense and perseverative interests are more likely to be attributed to challenges associated with IG, or to challenges associated with ASD.

<b>Intense and Perseverative Interests of ASD</b>	<b>Intense and Perseverative Interests of IG</b>
<p>The intense and perseverative interests that occur in children with ASD can lead to adaptive and social impairment. Children with ASD tend to recite facts about their interests, and these interests do not tend to evolve over time. Further, children with ASD may have a more difficult time fitting their interests into a larger context of knowledge and will likely not ask others thoughtful questions about their interests. These interests may seem unusual for the child’s developmental level, or in an area in which others have little interest.</p>	<p>The intense and perseverative interests that may occur in children with IG do not lead to adaptive or social impairments. They may ask others thoughtful questions about their areas of interest, or seek out experts in the field to befriend. Children with IG can and do show interest in other topics and can switch their interest off if it is interfering with social connections. The interests of children with IG tend to involve a greater depth of comprehension and they can fit these interests into a larger context of knowledge. These interests tend to evolve over time.</p>



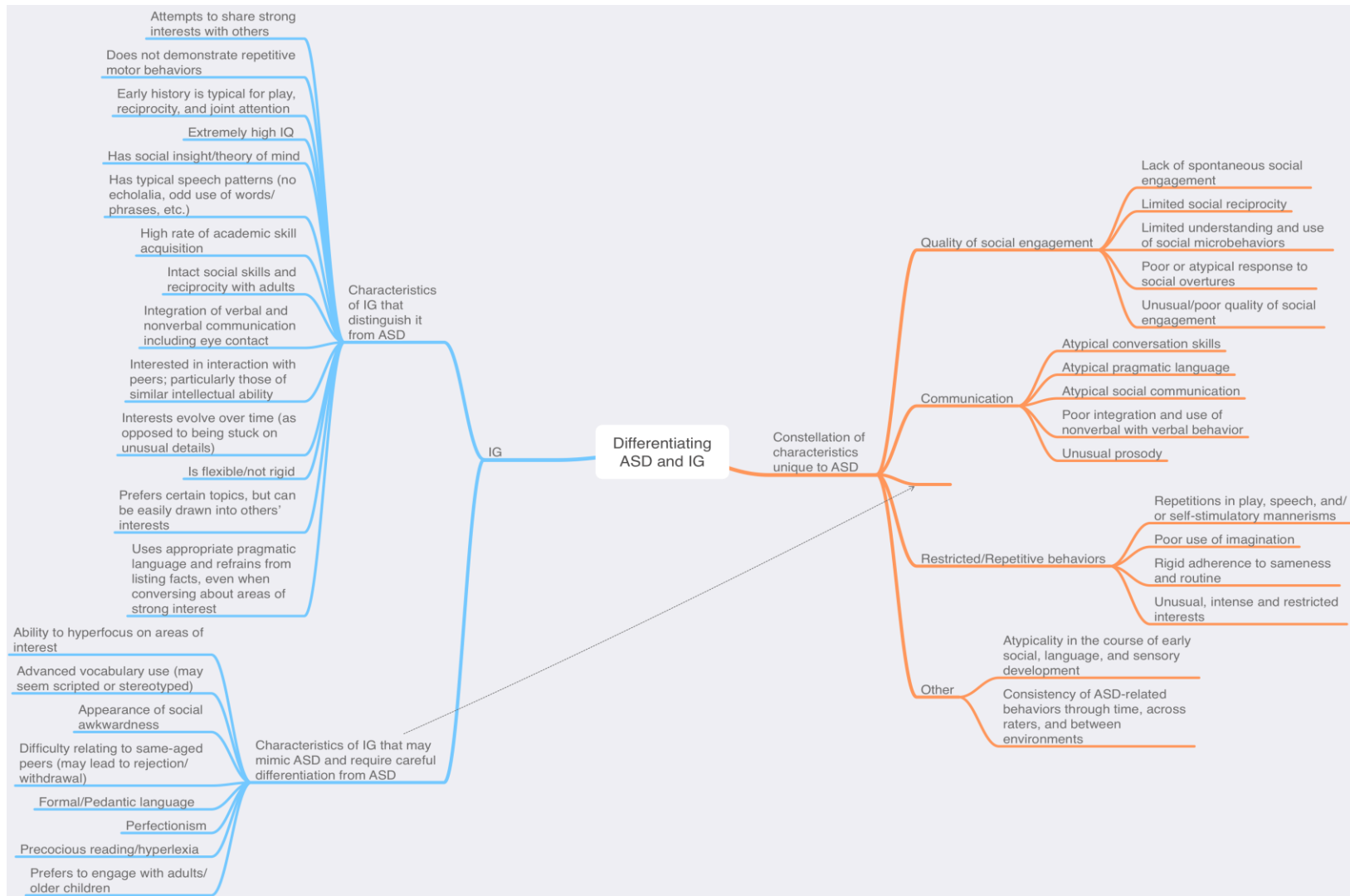


Figure 8. The process of differentiating ASD from Intellectual Giftedness

*Differentiating ASD and Speech and Language Impairment (SLI)*

<b>Characteristics of SLI that may mimic ASD</b>	<b>Characteristics of SLI that may distinguish it from ASD</b>
<ul style="list-style-type: none"><li>• Children with apraxia will present as nonverbal</li><li>• Difficulty following directions</li><li>• Expressive/receptive language delay</li><li>• Poor conversation skills including difficulty answering questions</li><li>• Poor understanding of pragmatic language</li><li>• Reduced amount of vocalizations</li><li>• Reluctance to interact with others (develops after history of difficult communication)</li><li>• Uses imitative echolalia while learning new words</li></ul>	<ul style="list-style-type: none"><li>• Demonstrates appropriate theory of mind (when tested in a way that he/she can express it)</li><li>• Has a variety of age-appropriate play/leisure interests</li><li>• Is flexible/not rigid</li><li>• Language, even if limited, is not characterized by echolalia, repetitive speech, odd use of words and phrases, or pronoun errors</li><li>• Language, even if limited, is social in nature</li><li>• Maintains eye contact</li><li>• No restricted or repetitive behaviors</li><li>• Nonverbal compensation for language difficulties leads to relative strength in nonverbal communication</li><li>• Shows interest in interacting with others</li></ul>

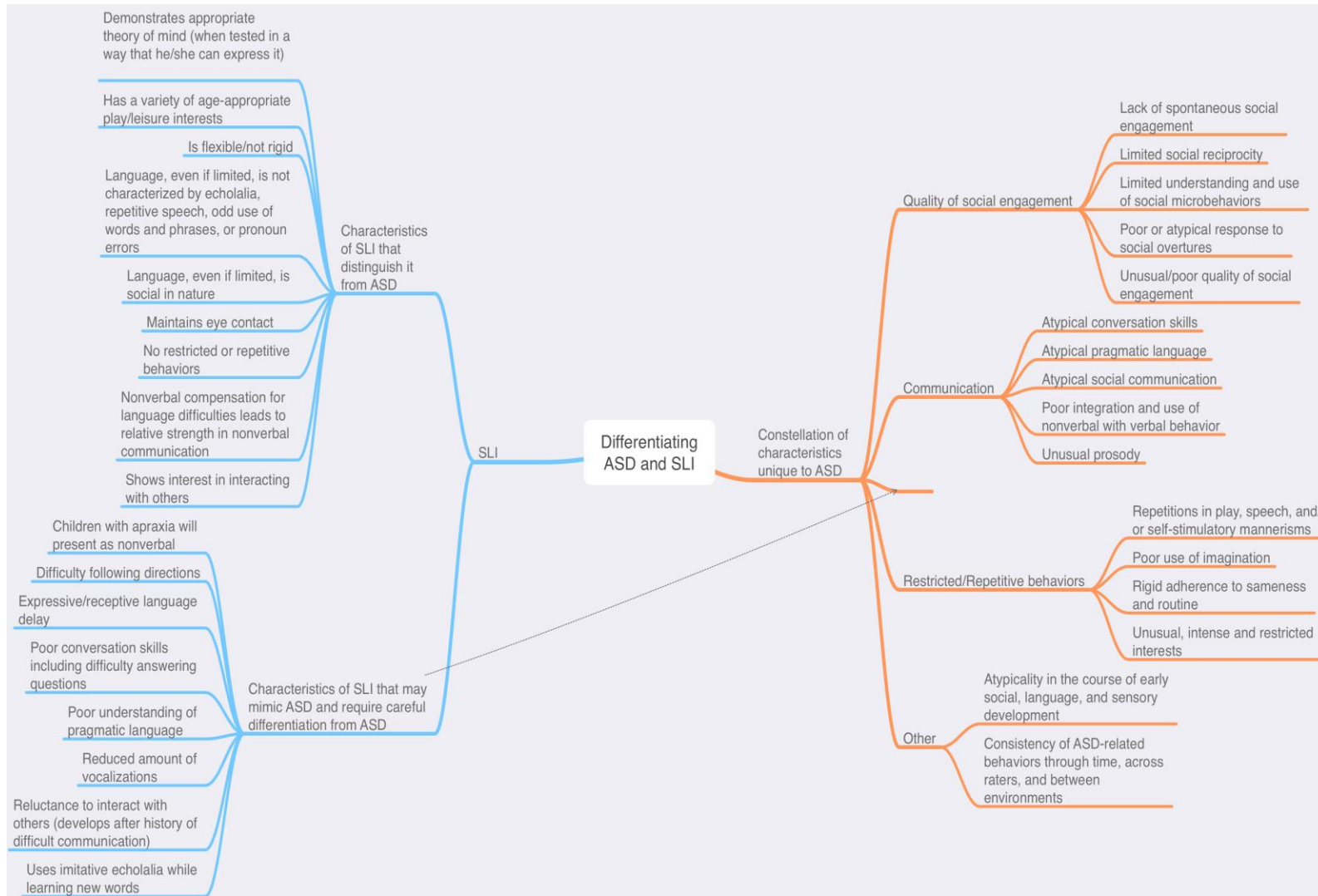


Figure 9. The process of differentiating ASD from Speech and Language Impairment (SLI)

## V: How Experts Confirm or Disprove Clinical Judgment

In order to make a final determination about whether or not a child has ASD, experts compare/contrast and integrate clinical judgments formed through observations with formal and informal test data. The following table summarizes the data experts agree is important to consider in making this determination.

<b>Experts Recommend the Following Occur in all Evaluations Where one is Attempting to Differentiate Between ASD and Another Condition</b>	
<ul style="list-style-type: none"> <li>• Use ADOS-2, ADI-R, or other ASD-Specific measures</li> <li>• Investigate medical, family, educational, developmental history through parent and teacher interview and record review</li> <li>• Observe in multiple environments</li> </ul>	
<b>Experts recommend that the following assessments should occur when an evaluator is attempting to differentiate between ASD and each listed condition specifically</b>	
<b>Specific Learning Disability</b>	<ul style="list-style-type: none"> <li>• Conduct or review academic and cognitive testing</li> <li>• Examine school records</li> <li>• Integrate findings of cognitive strengths and weaknesses, social skills/insight, and general behavior to determine if there are patterns of atypical behavior</li> <li>• Look at progress monitoring of academic skill development over time</li> <li>• While reviewing assessment results, focus on cognitive strengths and weaknesses</li> </ul>
<b>Disorders of Trauma and Attachment</b>	<ul style="list-style-type: none"> <li>• Conduct a play assessment</li> <li>• Conduct a student interview</li> <li>• Conduct interviews with therapists</li> <li>• During observations and interviews, focus on approach/avoidant behaviors in a variety of social contexts</li> <li>• Examine the overall constellation of behaviors</li> <li>• Examine the timeline of when the behaviors first occurred</li> <li>• Focus on confirming presence of trauma/neglect during record review and interviews</li> <li>• Focus on examining the nature and severity of the trauma during record review and interviews</li> <li>• Focus on responsiveness to a stable/nurturing environment</li> <li>• Use formal screening tools for trauma symptoms</li> </ul>
<b>Childhood Onset Schizophrenia</b>	<ul style="list-style-type: none"> <li>• Carefully examine and research the side-effects of any medications the child is on for possible contributions to hallucinations or delusions</li> <li>• Consult with or refer child to a psychiatrist/neurologist/specialist in COS</li> </ul>

	<ul style="list-style-type: none"> <li>• During evaluation and observation, focus on fluctuations in play, behavior, and social interactions</li> <li>• During history interviews, focus on family mental health</li> <li>• During parent interview, focus on course and timing of symptoms, as later onset of symptoms would be more indicative of schizophrenia</li> <li>• Examine any previous medical/genetics testing</li> <li>• Follow the child over time to differentiate, as early differentiation may not be possible</li> <li>• Interview with child with a focus on separating hallucinations/delusions from perseverative interests</li> <li>• Conduct standardized/direct assessment of psychosis/mental status</li> </ul>
<b>Mood Disorders</b>	<ul style="list-style-type: none"> <li>• Conduct a student interview</li> <li>• During interviews, record review, and observation look for development of mood symptoms over time</li> <li>• During observations, focus on interactions, play, and emotional regulation</li> <li>• During record review, focus on past treatment notes and look for evidence of clear mood episodes</li> <li>• Use mood/behavior-specific rating scales and standardized assessments</li> </ul>
<b>Anxiety Disorders</b>	<ul style="list-style-type: none"> <li>• Administer standardized interviews/rating scales to look for elevated anxiety symptoms</li> <li>• Conduct a play assessment</li> <li>• Conduct a student interview</li> <li>• During parent interview, focus on social interactions at home and with familiar people</li> <li>• Focus on examining the consistency of symptoms across familiar and unfamiliar environments</li> <li>• Look carefully at sensory-related behaviors to determine if they are fear/compulsion-based rather than a true sensory aversion</li> <li>• Take time to get to know the child for more accurate results</li> </ul>
<b>Intellectual Giftedness</b>	<ul style="list-style-type: none"> <li>• Administer an academic assessment</li> <li>• Administer an IQ/Cognitive assessment to confirm giftedness</li> <li>• During observations, focus on quality of interactions with familiar, and unfamiliar adults</li> <li>• During observations, focus on whether the child attempts to share his or her strong interests socially</li> <li>• During observations, focus on whether the child can pick up on subtle social cues</li> <li>• During observations, focus on whether or the child can shift topics to someone else's interests</li> <li>• During record review, focus on the context during which social or behavioral concerns first developed</li> <li>• Observe during peer interactions with gifted peers if possible</li> <li>• Use clinical judgment to assess the quality of social deficits</li> </ul>

<p style="text-align: center;"><b>Speech and Language Impairment</b></p>	<ul style="list-style-type: none"> <li>• Assess cognitive skills to see if other areas are affected</li> <li>• Conduct or review speech/language/pragmatic testing</li> <li>• During observations, look for eye contact, emotional responsiveness, joint attention, self-stimulatory behaviors</li> <li>• During parent interview, ask specifically about social interest and social behaviors during activities where language is not a hindrance</li> <li>• Look for compensation for delayed speech using other means during ADOS-2 or in natural environments</li> <li>• Observe/assess play, including alone, with familiar caregiver, and with examiner</li> </ul>
<p style="text-align: center;"><b>Attention Deficit Hyperactivity Disorder</b></p>	<ul style="list-style-type: none"> <li>• Conduct executive functioning assessments</li> <li>• Interact with the child to get a feel for the quality of social deficits</li> <li>• Treat for ADHD/increase structure and note whether social skills improve under these treatments</li> <li>• Use standardized assessments to look for elevated scores in hyperactivity, impulsivity, and inattention</li> </ul>
<p style="text-align: center;"><b>Intellectual Disability</b></p>	<ul style="list-style-type: none"> <li>• Consider ID as a comorbid condition to ASD</li> <li>• Compare cognitive levels to social/adaptive levels</li> <li>• Conduct play-based assessment/observations</li> <li>• Conduct a pragmatic language assessment</li> <li>• Conduct a social skills assessment</li> <li>• Complete a developmental profile</li> <li>• Look for even vs. uneven profiles during adaptive assessment</li> <li>• Look for even vs. uneven profiles during cognitive assessment</li> </ul>