

The Autism Spectrum Disorder Decision Tree (ASD-DT) for the PDDBI:

Rationale and Usage for Screening and Intervention Planning

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Executive Summary

The Autism Spectrum Disorder–Decision Tree (ASD-DT) is a decision tool developed to assist clinicians and researchers when screening for autism spectrum disorder (ASD) and making diagnostic and assessment decisions. The ASD-DT was developed to work in tandem with the PDD Behavior Inventory (PDDBI) to improve diagnosis, document change in status over time, as well as provide guidance for intervention. The rationale for development was two-fold: First, despite many existing level 1 and level 2 screening measures for ASD, mildly affected children were not being brought to the attention of clinicians until social demands exceeded abilities. Therefore, a need existed for an instrument that could be used with older children and adults, given that many available tools were designed specifically for infants and toddlers. Second, the clinical features of ASD overlap with other disorders that increase the false-positive rate for ASD, even when clinicians used “gold-standard” diagnostic assessment tools. Instructions on how to use the ASD-DT to screen for ASD and monitor status over time is also discussed.

Introduction

This white paper briefly describes the rationale for the development of the PDDBI Professional Manual Supplement: Autism Spectrum Disorder Decision Tree (ASD-DT; Cohen 2017b), a decision tool developed to assist clinicians and researchers when screening for autism spectrum disorder (ASD) and making diagnostic and assessment decisions. The ASD-DT is designed for children ages 18 months to 12 years, 5 months who are seen or referred for initial evaluation of a suspected diagnosis of ASD or for follow up. The document is based on an article by the author (Cohen, 2018) and assumes the reader has a basic knowledge of autism and clinical assessment. Use of the ASD-DT requires information from an administration of the PDD Behavior Inventory (PDDBI; Cohen & Sudhalter, 2005), so a brief discussion of PDD and its relationship to ASD will be presented first.

What is Autism and What is PDD?

Autism is a heterogeneous and complex disorder that has had multiple definitions since its first description in 1943 (Kanner). Previously considered to be the earliest onset of schizophrenia, autism was later recognized, based on years of research, as a developmental disorder (i.e., a disorder of brain development and functioning). Indeed, one year prior to the definition of autism as its own disorder in the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III;* American Psychiatric Association, 1980), the *Journal of Autism and Childhood Schizophrenia*, the major journal in the field, changed its name to the *Journal of Autism and Developmental Disorders*.

In the *DSM-III*, the notion that autism was no longer considered a psychosis was reflected in the use of the umbrella term *pervasive developmental disorder (PDD)*, of which three subtypes were recognized: infantile autism, childhood-onset PDD, and atypical PDD. Through successive revisions of the *DSM*, the subtypes went from three to two to five and, finally, in the fifth edition, to just one (American Psychiatric Association, 2013), changing the umbrella term PDD to the term *autism spectrum disorder (ASD)* with *no* behaviorally defined subtypes.

This concept of autism as a spectrum was meant to fit in with the notion that the disorders in the *DSM* were of a dimensional nature, varying in severity. This was thought to provide the impetus for the later development of empirically based subtypes of ASD. The decision to drop the *DSM-IV* subtypes (such as Asperger's disorder or PDD-Not Otherwise Specified [PDD-NOS]) also occurred because published studies (Lord & Bishop, 2015) indicated the *DSM-IV* subtypes were often not reliably diagnosed when cases were compared across clinical sites, including sites with clinicians having extensive experience in diagnosing ASD.

It must be stressed that PDD and ASD are both terms that have been used to describe people with autism. The development and publication of the PDDBI occurred prior to the name change in the *DSM-5* and used the earlier terminology. It should be noted, however, that there have been changes to the definition of PDD and ASD in the *DSM-5* and these include the following:

This concept of autism as a spectrum was meant to fit in with the notion that the disorders in the DSM were of a dimensional nature, varying in severity.

Timeline of Autism and the PDDBI

1943 First description of autism, considered the earliest onset of schizophrenia at the time.

1979 Name of the *Journal of Autism and Childhood Schizophrenia* changed to the *Journal of Autism and Developmental Disorders*.

1980 Autism defined as its own disorder in the *Diagnostic and Statistical Manual of Mental Disorders (DSM), Third Ed.* Autism was reflected under the umbrella term of pervasive developmental disorder (PDD).

2005 The PDD Behavior Inventory (PDDBI) was published.

2013 The *DSM-5* was published, changing the umbrella term PDD to autism spectrum disorder.

2017 The PDDBI ASD-DT and Adolescent Age Extension are published.

1. The presence of two, instead of three, inclusionary diagnostic criteria. In the *DSM-IV*, qualitative impairments in socialization (e.g., poor eye contact, emotional reciprocity, sharing interests) and qualitative impairments in communication (e.g., stereotyped language, conversational deficits) were separated. In the *DSM-5*, these were collapsed into one category, persistent deficits in social communication and social interaction, because factor analytic studies indicated these domains were not orthogonal. ***These findings are consistent with the conceptual structure of the PDDBI, as well as with empirical examination of its factor structure.***
2. The addition of sensory issues (i.e., restricted; repetitive patterns of behavior, interests, or activities) to the second behavioral criterion. This second criterion includes lower-order repetitive behaviors such as hand flapping and higher-order repetitive behaviors such as ritualisms, insistence on sameness, etc. The sensory dimension includes either hyper or hyposensitivity to sensory stimuli (e.g., hyperacusis; indifference to pain; intense fascination with edges, lights, or patterns). ***These behaviors are addressed in the PDDBI.***
3. Attention-deficit hyperactivity disorder (ADHD) can now be diagnosed with ASD if the criteria for both disorders are met. This was not previously permitted.
4. A new diagnosis similar to ASD was introduced, social (pragmatic) communication disorder. This condition describes higher-functioning individuals who have marked difficulties with the pragmatics of social interaction, but do not show the sensory issues, mannerisms, need for sameness, or rituals characteristic of ASD. Because this is a new category, research is limited and it may be possible these people represent subthreshold ASD (Mandy, Wang, Lee, & Skuse, 2017). ***One of the ASD-DT subgroups (see the following) may describe such cases.***

Given these changes, it is important to understand whether cases diagnosed under *DSM-IV* criteria would meet the new *DSM-5* criteria. One relatively recent comparison study indicated that, based on parent report alone, the sensitivity of the *DSM-5* (i.e., the percentage agreement with an established autism diagnosis based on *DSM-IV* criteria) was 91%, while specificity (i.e., the percentage agreement of *DSM-5* with *DSM-IV* that the cases do not have autism) was 51% (Huerta, Bishop, Duncan, Hus, & Lord, 2012). Thus, a prior *DSM-IV* diagnosis of autism would likely continue to be such under the new criteria, but agreement for cases that were previously negative for autism following *DSM-IV* criteria was 50/50. These individuals require more intense scrutiny.

The notion of autism as a spectrum should not be construed as implying it has a single etiology (i.e., cause) and/or that differences between cases are to be found only in degree of severity. There is not much support for this notion from the literature. Indeed, as early as 1976, Coleman used the term *the autistic syndromes* in her now-famous book of the same name (Coleman, 1976), referring to the fact that autism can be associated with a variety of different biological

etiologies. The term *autisms* has been used in the literature as well. Thus, the concept of autism as a unidimensional entity has been abandoned; it is increasingly recognized that this is a heterogeneous condition at both the etiological and behavioral levels.

Screening for ASD

In a recent Centers for Disease Control (CDC) study (Christensen et al., 2016) of the prevalence of autism in the United States, the median age at diagnosis was 40 months, yet there exists a substantial body of research to suggest that early intervention can mitigate the severity of ASD (with concomitant impacts on the family) and so screening and diagnosis is of utmost importance. Ideally, pediatricians would prioritize early screening for ASD at well-baby checkups. At present, there are no biomedical tests *uniquely specific* to ASD and so, in the absence of a known family history for linked genetic and biological disorders, screening is based on behavioral features. In 1999, the author was part of a New York State Department of Health panel that established best practice early intervention guidelines for diagnosis, assessment, and intervention for ASD; these recommendations were recently revised. The new guidelines describe the currently available screening instruments for infants and toddlers and can be found at https://www.health.ny.gov/community/infants_children/early_intervention/disorders/autism. The CDC also has valuable information on the topic <https://www.cdc.gov/ncbddd/autism/index.html>.

Distinctions can be made between two types of screening—Level 1 and Level 2 (Zwaigenbaum et al., 2015). See Figure 1.

Level 1 Screening

Level 1 screening consists of assessing for a disorder in all cases *regardless of prior concerns* (i.e., universal screening). For example,

screening for phenylketonuria (PKU) is done at birth for all children in the United States because a highly sensitive and specific test can be performed. Should ASD likewise be universally screened? The answer is, it depends. There are sensitive and relatively specific criterion-based rating scales designed for early detection of ASD (see the websites listed earlier in this paper) but there are additional issues that must be considered.

There exists a substantial body of research to suggest that early intervention can mitigate the severity of ASD

Prevalence of ASD and Level 1 Screening Issues

A recent CDC study indicated the prevalence of ASD to be 168 cases for every 10,000 people in 8-year-olds (i.e., a little over 1% of the population; Baio et al., 2018). Hispanic children were underrepresented in the numbers. Hence, ASD is, relatively, a rare condition. When using a screening instrument on such a rare disorder, an important measure to consider is predictive validity (i.e., what percent of cases predicted to be positive for ASD actually have the condition [*positive predictive validity*] or, conversely, what percent of cases predicted

Levels of ASD Screening	
Level 1	Level 2
<p>A universal screening regardless of prior concerns. Because of the low incidence of ASD in the population (i.e., 146 cases out of 10,000 individuals), one can expect very low positive predictive validity (i.e., a high rate of false positives).</p>	<p>A screening restricted to at-risk cases where ASD is suspected by parents or professionals. When a level 1 screening indicates a problem, or when ASD is suspected, the predictive validity of a level 2 screening is higher than a traditional level 1 screening and provides fewer false-positive results.</p>
	<p>Caveats: Mildly affected children may not raise concerns until they enter school, so screening tools must go beyond the scope of infants and toddlers. False positives may increase because ASD features overlap with other disorders including schizophrenia, social anxiety disorder, obsessive-compulsive disorder, intellectual disability without ASD, and ADHD without ASD.</p>

Figure 1. Levels of ASD screening.

to not have ASD, don't have it [*negative predictive validity*])? Unlike sensitivity and specificity measures, which are derived by agreement with prior diagnoses, predictive validity measures are influenced by the prevalence of the disorder.

The available screening measures for ASD, including those with very good sensitivity and specificity, will yield very low positive predictive validity rates (and a high rate of false positives [i.e., cases identified as ASD that do not have it]) but a very high negative predictive validity rates *if these measures are used to screen all children*. Why is this the case? Assume that a screening test has sensitivity and specificity values of 90% (i.e., the test agrees with existing clinical diagnosis 90% of the time), which would be considered by many to be a very good test. Only 10% of cases in such a test are misclassified. What happens when this test is used to screen *all cases*?

For example, in a pediatric clinic that sees 5,000 toddlers per year, about 1% (i.e., 50 children) would be expected to have ASD (recent estimates are slightly higher, but 1% makes the calculation easier and doesn't affect the argument). A 90% sensitive test would identify 45 of those cases, which is not bad. But of the 4,950 cases that don't have ASD, about 10% (i.e., 495 cases) would be falsely classified as ASD. This could be a problem, although one could argue the false positives may have disorders similar to ASD that are worth examining. In this case, the positive predictive validity for the test is: $100 \times 45 \div (45 + 495) = 8\%$. Using this test, prediction over the base rate improved by 7%, but *92% of the cases flagged would be false positives*. Negative predictive validity, in turn, is: $100 \times 4,455 \div (5 + 4,455) > 99\%$.

In such cases, passing the screening is highly predictive of the absence

of ASD. Failing the screening in such a universal screening situation does *not* indicate ASD is present, only that the informant recognized a problem. This means informants should be made aware of this because, in most cases, children who fail the screening would *not* have ASD, even though the test was developed for that purpose. This problem with universal (i.e., level 1) screening is not specific to autism or to any given behavioral screener; it is true for any disorder that appears relatively infrequently in the population. There do not yet exist behavioral screeners that are 100% sensitive and 100% specific, something that would be required for accurately predicting ASD in all children.

The Modified Checklist for Autism in Toddlers (M-CHAT; Robins, Fein, Barton, & Green, 2001), a commonly used level 1 screener for toddlers had a problem with high false-positive rates. To address this issue, it required the administrator to follow up such false positives with a direct interview of the informant. This addition led to changing the title to the Modified Checklist for Autism in Toddlers, Revised with Follow-Up (M-CHAT R/F; Robins, Fein, & Barton, 2009). This modification incorporated elements of level 2 screening and diagnostic assessment, see the following section, thereby improving detection (Robins, Casagrande, Barton, Chen, Dumont-Mathieu, & Fein, 2014).

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Level 2 Screening

By contrast, level 2 screening refers to assessing at-risk ASD cases (where risk is based on previous research outcomes). These include cases where the disorder is suspected by parents or professionals, a child fails a level 1 screening, a child may be at risk because an older sibling has ASD or a family history of ASD, complications of pregnancy or birth (e.g., preterm delivery), or a known medical disorder linked to ASD. In such cases, the *a priori* probability of ASD is much greater than 1% and so the predictive validity of the screening test will be much higher with fewer false positives. Therefore, screening is much more likely to be of value when one can narrow down the list of cases to be ascertained. In statistical terms, level 2 screening is a Bayesian approach in which prior knowledge about the condition can be used to improve the odds of detecting it.

However, there are additional complications that need to be considered at level 2. As noted in the *DSM-5*, mildly affected children may not be brought to the attention of clinicians until social demands exceed abilities. There is, therefore, a need for continued screening over time, but many of the available screening tools are designed specifically for infants and toddlers. Second, the clinical features of ASD overlap with other disorders which, in turn, can increase the false-positive rate for ASD in those conditions, even when clinicians use so-called "gold-standard" diagnostic assessment tools such as the Autism Diagnostic Observation Schedule (ADOS; [Lord, Rutter, DiLavore, & Risi, 1999; Gotham et al., 2008]). Clinicians often use the ADOS in real-life settings where children with a variety of disorders that overlap with ASD are evaluated (Molloy, Murray, Akers, Mitchell, & Manning-Court, 2011; Bastiaansen et al., 2011), such

as schizophrenia, social anxiety disorder, obsessive-compulsive disorder, intellectual disability without ASD, ADHD without ASD, which can cause false positives.

The ASD-DT

For these reasons, the author developed a diagnostic decision tree to work in tandem with the PDDBI (Cohen, 2003; Cohen, Schmidt-Lackner, Romanczyk, & Sudhalter, 2003), a tool developed to assist in diagnosis and to monitor change over time in children with autism. The PDDBI became available for general clinical use in 2005 (Cohen & Sudhalter, 2005). The PDDBI is a rating scale, standardized separately on parent and teacher informants in a large, well-diagnosed sample (i.e., it is a norm-referenced instrument) with very good reliability and validity statistics. It was originally designed for children ages 1 year, 5 months to 12 years, 4 months, but the age range has since been extended to cover the adolescent years (Cohen, 2017a). A brief screening version that covers the same broad age range as the original PDDBI is also available (Cohen, 2011), but it yields only a single score indicative of risk for ASD. The PDDBI assesses both maladaptive and adaptive behavior, making it ideal for monitoring progress or deterioration over time. Recently, TRICARE, the agency that provides healthcare for the military, mandated the PDDBI be used for monitoring affected children over time.

The ASD-DT for the PDDBI *is designed specifically for level 2 screening* and was based on a large multisite sample of cases using machine-learning technology (Cohen et al., 2016; Cohen et al., 2017). The ASD-DT was published in 2017 (Cohen, 2017b). Sensitivity and specificity are very good and, thanks to the use of machine learning, predictive validities are also good, especially when the ASD-DT yields similar results from parent and teacher informants (which happens 75% of the time). Results from the ASD-DT generalize well across age-groups and clinical diagnostic sites and agree well with Autism Diagnostic Schedule (ADOS; Lord et al., 2000) subgroups (i.e., Not ASD, ASD, and Autism).

Machine learning handles the problem of overlapping symptoms across disorders by using multiple cut-off scores instead of just one, as would be the case with many rating scales. Previous work by the author comparing PDDBI scores for children with ASD to children with ADHD, for example, indicated that parents of children with ADHD often rated their children more severely on one of the PDDBI domains that assesses aggression than did parents of children with ASD (Cohen, 2013). The fact these scores

were higher than those for the ASD group was an advantage in that it enabled the software to identify these and similar cases as separate because their scores were “too high” relative to those expected for ASD cases. Additionally, the software was able to identifying those typically developing children whose scores were “too low.”

Interestingly, the ASD-DT identified three subtypes of ASD that differ along several clinically-relevant dimensions of importance for assessment and long-term monitoring. These three subtypes are designated Minimally Verbal ASD, Verbal ASD, and Atypical ASD. Each subgroup has unique PDDBI, adaptive skills, and IQ profiles. The Minimally Verbal subtype is the most severely affected cognitively. The Atypical group is, behaviorally, in-between the Minimally Verbal and Verbal (least cognitively affected) subtypes. These subtypes also differ in language development milestones, history of seizures, presence of known neuro-genetic syndromes/findings, and presence of an X-linked genetic variant associated with increased severity in affected males (Cohen et al., 2011); the Atypical subtype was found to be the most different genetically from the other two subtypes. Preliminary data suggest these three ASD subtypes differ in adaptive skills development (i.e., communication, daily living skills, socialization, motor skills) over time (Cohen and Flory, in preparation); this finding has implications for intervention. These data also are consistent with other studies of adaptive skills trajectories in children with ASD, but are unique in that they tie the adaptive skills changes to ASD-DT subtypes of ASD.

The PDDBI, together with the ASD-DT, can help in improving diagnosis, documenting change in status over time, as well as providing guidance for intervention.

In our research, the ASD-DT also identified several non-ASD subgroups of clinical relevance. In the ASD-DT manual, suggestions are given regarding alternative diagnoses to consider along with additional assessments that may be of clinical value. A few of these subgroups had *T* scores that were unusually high, suggesting other issues need to be examined (e.g., medical and psychiatric). Of interest, one of the non-ASD subgroups resembled the new *DSM-5* label of Social (Pragmatic) Communication Disorder, but it remains to be seen the extent to which this label and the ASD-DT category agree.

The ASD-DT is unique in this regard as it is the only system that yields clinical (and research) relevant subgroups for a broad age range.

How and Why to Use the ASD-DT

The ASD-DT uses *T* scores from the original parent or teacher version of the PDDBI; the adolescent extension cannot be used. If administration or scoring has been done via PARiConnect, PAR's online assessment platform, ASD-DT scores are generated automatically. If the clinician is using the paper-and-pencil version of the PDDBI, results are easily completed by the clinician using a series of decision steps based on the value of the *T* score for each domain.

The clinician can examine the results, compare them across informants for agreement, and review the suggestions for additional assessments or diagnoses to consider (which may include medical, psychological, or psychiatric evaluations depending on the ASD-DT subgroup). If follow-up evaluations will be performed using the PDDBI, the ASD-DT can be used upon readministration, allowing the results to be compared for significant change in status. Change in status could have implications for additional assessments and interventions.

How to Use the ASD-DT When Screening for ASD

Data indicate the positive predictive validity for the ASD-DT is high, especially for the global category of ASD (regardless of subtype) and this is especially the case when ASD-DT results between parent and teacher forms agree (teachers include special

education teachers, speech/language therapists, behavioral analysts, or other professionals with extensive experience working with the child). Negative predictive validity is good. As noted, global ASD-DT agreement between informants is about 75%.

Information provided by the ASD-DT can be shared with other relevant professionals to assist in the diagnostic process. This may be of interest to psychologists who are not licensed to provide clinical diagnoses (see Figure 2).

The suggestions provided (which, as noted earlier, depend on ASD subtype or non-ASD subgroup) should be of clinical value for additional assessments (e.g., cognitive, challenging behaviors, "psychiatric," medical) that could impact treatment planning and intervention. For example, it is important to note that ASD, in many cases, does not explain all the behavior problems often thought to be associated with the condition as some clinicians are wont to do (a phenomenon called *diagnostic overshadowing*). Comorbidity is common in ASD and, as noted earlier, can account for problems such as episodic aggression and self-injury (examples include Tourette syndrome, sleep disorders, mood disorders, and seizures, as etiological factors here). These comorbid disorders can be responsive to medication (Tsiouris, Cohen, Patti, & Korosh, 2003; Tsiouris, Kim, Brown, & Cohen, 2011).

The ASD-DT can be used to screen for ASD in toddlers, preschoolers, and school-aged children, expanding the age range for detection in at-risk cases including more mildly affected cases that may not come to the attention of clinicians until their social skills are no longer keeping up with their peers.

The presence of programs using empirically-based behavioral methodologies are more available now than ever before and there now exist valid and reliable tools such as the PDDBI for monitoring changes in maladaptive behaviors and adaptive skills over time. The PDDBI, together with the ASD-DT, can help in improving diagnosis, documenting change in status over time, as well as providing guidance for intervention.

ASD-DT Classification Nodes

<p>Atypical ASD: <i>Classification Node 1.1</i></p> <ul style="list-style-type: none"> • Potential deficits: Nonverbal and verbal social communication delays, intellectual deficits, motor delays, comorbid medical issues such as seizures • Further assessments recommended: Medical and audiological assessment, cognitive and adaptive testing, speech and language assessment, clinical diagnostic evaluation for ASD 	<p>Verbal ASD: <i>Classification Node 2.3</i></p> <ul style="list-style-type: none"> • Potential deficits: Social and behavioral issues <p><i>Possible diagnoses</i> include formerly “high-functioning autism” and/or Asperger’s disorder depending on developmental history and current language competence</p> <ul style="list-style-type: none"> • Further assessments recommended: Clinical diagnostic evaluation for ASD, behavioral assessments, cognitive and adaptive testing, language assessment (especially semantic and pragmatic language competence), social skills and social cognition evaluation, and evaluation for comorbid mood and anxiety problems
<p>Minimally Verbal ASD: <i>Classification Node 1.2</i></p> <ul style="list-style-type: none"> • Potential deficits: Intellectual deficits, nonverbal and verbal communication delays, elevated sensory behavior, motor problems, arousal regulation problems, comorbid medical issues such as seizures • Further assessments recommended: Clinical diagnostic evaluation for ASD, behavioral evaluations, medical and audiological assessment, cognitive and adaptive testing, speech and language assessment 	<p>ASD Not Likely: <i>Classification Node 2.4</i></p> <ul style="list-style-type: none"> • Potential deficits: Behavioral and cognitive problems <p><i>Possible diagnoses</i> include obsessive-compulsive disorder and generalized anxiety disorder</p> <ul style="list-style-type: none"> • Further assessments recommended: Review PDDBI-PX and/or PDDBI-TX item scores with the informant to ensure that the information is accurate rather than an overrepresentation of symptoms. If overreporting is ruled out, behavioral evaluations, cognitive and adaptive assessments, medical evaluation
<p>ASD Not Likely: <i>Classification Node 1.3</i></p> <ul style="list-style-type: none"> • Potential deficits: Intellectual deficits, nonverbal and verbal communication delays, motor delays, behavior management issues, comorbid medical issues such as seizures, comorbid mood or anxiety disorders <p><i>Possible diagnoses</i> include intellectual disability disorder and generalized anxiety disorder</p> <ul style="list-style-type: none"> • Further assessments recommended: Review PDDBI-PX and/or PDDBI-TX item scores with the informant to ensure that the information is accurate rather than an overrepresentation of symptoms. If overreporting is ruled out, clinical diagnostic evaluation for ASD, medical, dental, behavioral, cognitive, adaptive, and speech evaluations 	<p>ASD Not Likely: <i>Classification Node 2.5</i></p> <ul style="list-style-type: none"> • Potential deficits: Behavioral and cognitive problems <p><i>Possible diagnoses</i> include disruptive mood regulation disorder, oppositional defiant disorder, ADHD, generalized anxiety disorder, and pediatric bipolar disorder</p> <ul style="list-style-type: none"> • Further assessments recommended: Review PDDBI-PX and/or PDDBI-TX item scores with the informant to ensure that the information is accurate rather than an overrepresentation of symptoms. If overreporting is ruled out, behavioral evaluations, cognitive and adaptive assessments, medical evaluation
<p>ASD Not Likely: <i>Classification Node 2.1</i></p> <ul style="list-style-type: none"> • Potential deficits: Social delays without major problems with pragmatic language skills <p><i>Possible diagnoses</i> include attention-deficit/hyperactivity disorder (ADHD), primary language impairment, social communication disorder, social anxiety disorder, and unspecified communication disorder</p> <ul style="list-style-type: none"> • Further assessments recommended: Assessment of social and adaptive skills, cognitive profile, and assessment of pragmatic language skills to verify the child’s capability in this area 	<p>ASD Not Likely: <i>Classification Node 3.1</i></p> <ul style="list-style-type: none"> • Potential deficits: Learning disabilities or language delays • Further assessments recommended: Depend on the nature of the referral complaints
<p>ASD Not Likely: <i>Classification Node 2.2</i></p> <ul style="list-style-type: none"> • Potential deficits: Social delays and problems with pragmatic language skills <p><i>Possible diagnoses</i> include ADHD, primary language impairment, social communication disorder, social anxiety disorder, and unspecified communication disorder</p> <ul style="list-style-type: none"> • Further assessments recommended: Assessment of social and adaptive skills, cognitive profile, and assessment of pragmatic language skills to verify the child’s difficulties in this area 	<p>Social Pragmatic Behavior Problems: <i>Classification Node 3.2</i></p> <ul style="list-style-type: none"> • Potential deficits: Social pragmatic behavior problems <p><i>Possible diagnoses</i> include social communication disorder, ADHD, social anxiety disorder, or generalized anxiety disorder</p> <ul style="list-style-type: none"> • Further assessments recommended: Clinical diagnostic evaluation for ASD, behavioral assessments, cognitive and adaptive testing, language assessment (especially semantic and pragmatic language competence), social skills and social cognition evaluation, and evaluation for comorbid mood and anxiety problems
	<p>ASD Not Likely, with Typical Social Skills: <i>Classification Node 3.3</i></p> <ul style="list-style-type: none"> • Potential deficits: Learning disabilities or language delays • Further assessments recommended: Depend on the nature of the referral complaints

Figure 2. Classification Nodes from the PDDBI ASD-DT form.

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