ASD-PEDS

USER'S MANUAL

An Autism Evaluation Tool for Toddlers and Young Children

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ASD-PEDS: An Autism Evaluation Tool for Toddlers and Young Children

ASD-PEDS
User's Manual

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Learn more at:
triad.vumc.org/asd-peds

Chapter 1:
Introduction

Background

WHAT IS THE ASD-PEDS?

The ASD-PEDS is a tool developed for the observation of autism-related behaviors in toddlers and young children. The ASD-PEDS consists of several play-based activities designed to elicit social communication and interaction—including interactive play, imitation, joint attention, and requesting—and to assess for the presence of restricted interests and repetitive behaviors. It is designed to be used in person across different settings (e.g., in a medical office/clinic or home setting), with a provider engaging in a series of interactive activities with the child using commonly available, low-cost toys. The ASD-PEDS takes 15-30 minutes to administer, depending on child, provider, and caregiver behaviors.

Development

The ASD-PEDS was developed using a multi-step process.[1-4] First, machine learning techniques were applied to a large clinical research database of behavioral assessment variables from children who had received comprehensive evaluations for autism.[1] Specifically, feature selection techniques were used to identify the clinical features that best differentiate ASD from non-ASD cases, resulting in the identification of seven key variables. Next, a team of Vanderbilt providers (i.e., ADOS-2 trainers and research-reliable psychologists) reviewed these variables and created behavioral descriptors based on the underlying constructs they represented. These descriptors were reviewed by a larger group of pediatric providers (i.e., licensed clinical psychological providers, developmental behavioral pediatricians, postdoctoral fellows) to clarify and simplify language. The design team operationalized these behaviors using a Likert-style scale, establishing the activities and scoring guidelines appearing on the *ASD-PEDS Rating Form*. Finally, the design team generated a set of administration activities intended to elicit observations tied to these key behaviors. Research is ongoing related to virtual[2-3] and in-person administration,[4] with both modalities representing valid ways to structure observations and determine presence of autism characteristics. For more information about remote use via tele-assessment please see triad.vumc.org/tele-asd-peds.

It is important to note that the most recent validation research on the ASD-PEDS was completed using a tablet-based app to support administration of activities.[4] This manual and the printed materials it includes reflect adaptations to administration and scoring of the ASD-PEDS based on ongoing validation studies and qualitative research.[5] Please see triad.vumc.org/asd-peds for updated research, training videos, and scoring examples.

WHO SHOULD USE THE ASD-PEDS?

The ASD-PEDS is designed for use by providers with specific training in recognizing autism characteristics and diagnosing autism in toddlers. These providers may include psychologists and licensed senior psychological examiners, pediatricians, speech-language pathologists, developmental pediatricians, nurse practitioners, and other allied health professionals. Recent research supports use of the ASD-PEDS by community pediatric providers with varying levels of familiarity with autism.[4] *However, it is important for individual providers to consider their own training, experience, and comfort level with identifying autism in young children. Providers should seek supervision and training as needed and only operate within their scope of practice and expertise. The ASD-PEDS should only be used as one part of a broader evaluation/ conceptualization, as detailed below.*

HOW DOES THE ASD-PEDS FIT INTO A DIAGNOSTIC EVALUATION?

The ASD-PEDS is designed to be a tool used flexibly to guide observations of toddlers referred for concerns related to autism. It is appropriate for use as part of a diagnostic evaluation, or as an evaluation of presenting autism characteristics. When used as a diagnostic tool, the ASD-PEDS should be combined with a thorough developmental and medical history, as well as a comprehensive interview regarding the presence of autism-related behaviors. Evaluation outcomes, including any diagnostic decisions, should be based on the provider's clinical judgment and the totality of information available about the child. **An autism diagnosis should not be solely based on the ASD-PEDS score.**

WHAT ARE THE AGE RANGE AND LIMITATIONS OF THE ASD-PEDS?

The ASD-PEDS was developed using a database including toddlers between 14-36 months of age. Similarly, the most recent validation research on the ASD-PEDS supports use with toddlers aged 18-36 months.[4] Research on the telehealth version of this tool (TELE-ASD-PEDS) has documented use with children as young as 17 months and as old as 60 months.[3,6] The ASD-PEDS may be used to structure observations for a range of toddlers and young children; however, the scores and processes described in this manual may be less relevant than clinical judgment when evaluating children who are older than 36 months of age, are not walking, have medical complexities that would complicate the diagnosis (e.g., visual or hearing impairments), have a complex trauma or social history, or are not accompanied by a familiar caregiver. We encourage individual providers and groups to use their best clinical judgment in determining what seems appropriate and a good fit for their patients and practice.

Components

ASD-PEDS ADMINISTRATION GUIDELINES:

The administration guidelines note key behaviors for the examiner to observe, both throughout the administration and specific to individual activities. Each activity is described, together with suggested verbal prompts for the provider to deliver. Space is provided for recording observations.

ASD-PEDS RATING FORM:

The *ASD-PEDS Rating Form* is used to calculate the child's score on seven key behaviors. The total score can be used to assist in determining ASD classification.

References

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Chapter 2:
Administration

General Administration Guidelines

Before administration, the provider should be familiar with the ASD-PEDS activities, materials, and rating form.

The ASD-PEDS was designed to be administered flexibly and tasks/materials can be modified as needed for the provider to make meaningful observations. Please see the ASD-PEDS website for additional guidance on administration and scoring: triad.vumc.org/asd-peds.

For activities with multiple trials, the full set of trials does not need to be administered at the same time. For example, if a child loses interest during a requesting activity, the provider may delay presenting another trial until the child's motivation increases.

All activities should be administered by the provider, but the provider can also ask caregivers for their observations and input during the assessment (e.g., clarifying a child's vocalizations, asking if behaviors are similar at home). Providers can also ask caregivers for help with behavior management as needed or to engage with their child as noted in specific activities.

General guidelines are provided regarding materials to be used during the ASD-PEDS; however, providers and caregivers may substitute materials based on availability and the preferences of the child. There is likely clinical utility to observing when a child has trouble disengaging from certain activities; however, providers should be prepared to adapt activities when a preferred item is preventing a comprehensive observation. Technology-based activities (e.g., phones, tablets, computers) are strongly discouraged.

After administering the ASD-PEDS, the provider should ask whether the child's behavior during the administration was representative of the child's behaviors generally, acknowledging that only a short sample of the child's behavior was observed. Recall that the ASD-PEDS should be used as one part of an evaluation that includes a clinical interview with the child's caregiver. The ASD-PEDS can be administered before or after the clinical interview, depending on provider and family preference.

Materials

The listed materials are meant to be suggestions. Providers may substitute materials based on availability and preferences of the child. Providers do not need to have all materials, only enough to be able to engage the child and administer each activity.

PLAY MATERIALS	REQUESTING MATERIALS	READY-SET-GO MATERIALS
• Sensory toy (e.g., glitter wand, textured or noise-making ball) • Pretend play (e.g., doll, animal/people figurines) • Plastic cup and spoon • Shape sorter/blocks • Musical toy or sound maker	• Clear container with lid that closes tightly • Preferred item(s) for container (e.g., small snack, sticker, small toy)	• Ball • Pop-rocket • Car/truck/train • Deflated balloon • Flying disc launcher

Administration and Activity Descriptions/ Objectives

Please see complete Administration Guidelines for detailed instructions and scripts. Please also visit triad.vumc.org/asd-peds for video examples of administration.

1. Orient caregivers to the ASD-PEDS activities. If you routinely conduct the ASD-PEDS within a clinic setting, we recommend having a complete kit of materials (see table above) readily available.
2. Complete each activity described in the ASD-PEDS Administration Guidelines. Record observations of the child's behavior in the space designated on the administration guidelines form.
3. Assign a score using the Likert-scale (1, 2, 3) for each of the seven key behaviors defined on the *ASD-PEDS Rating Form*.
4. Calculate a total score to assist in determining the child's classification.

FREE PLAY:

The goal of this activity is to observe the child's play behaviors by allowing the child to explore the toys independently, without labeling toys or giving specific instructions. Introduce an assortment of developmentally appropriate toys and observe the child's interactions with you and caregivers during play. Play should be child-directed, but you and the caregiver can respond as you normally would if the child initiates an interaction.

CALLING NAME (TWO TRIALS):

The goal of this activity is to observe whether the child responds to his/her name by engaging in eye contact, vocally responding, and/or directing expressions and gestures. Simply call the child's name during Free Play (when he/she is not looking toward you) and observe how he/she responds. You can also ask the caregiver to call the child's name.

DIRECTING ATTENTION (TWO TRIALS):

The goal of this activity is to observe whether the child follows your point as well as if they direct vocalizations or nonverbal gestures/expressions. Find an object not directly in front of the child, get his/her attention, shift your gaze while pointing at the object, and tell him/her to look at the object without labeling it.

JOINT PLAY/TURN-TAKING:

The goal of this activity is to observe the child's interaction with you when you join his/her play. Join the child's play in whatever way feels natural. Eventually encourage the child to take turns by rolling a ball, car, or other toy back and forth. Make multiple bids for the child to play *with* you, rather than simply playing near him/her.

FAMILIAR PLAY ROUTINE:

The goal of this activity is to observe the child during a game that solicits social responses/reciprocity. Initiate a familiar, socially engaging play routine with the child (e.g., peek-a-boo, tickling, or one suggested by the caregiver). If the child does not engage with you, ask the caregiver to start the game and join in when possible.

READY-SET-GO ROUTINE (THREE TRIALS):

The goal of this activity is to provide an opportunity for the child to engage socially or direct your attention to an unexpected or exciting event (e.g., flying balloon, pop rocket, flying disc launcher). Get the child's attention the best that you can. Activate/launch the toy and then pause to give the child an opportunity to socially respond or initiate the routine.

REQUESTING (THREE TRIALS):

The goal of this activity is to observe how the child asks for help in accessing a preferred item. Look specifically as to whether the child pairs vocalizations or gestures with eye contact. Present the item in a tightly closed clear container. After the child requests, or if the child does not request when given the opportunity, give the child brief access to the item (e.g., small bite of snack, briefly giving them the sticker/toy). Alternatively, you could activate a Ready-Set-Go toy and then keep the toy out of reach to give the child an opportunity to request more. This process is completed three times total, or until you feel the child has had ample opportunities to request.

IGNORING:

The goal of this activity is to observe how the child plays on their own. This includes observing if he/she spontaneously initiates play by looking, vocalizing, or showing/giving toys. Re-present some of the toys and purposefully ignore the child while he/she is playing. If the child makes an initiation towards you/caregiver, you can respond as you normally would.

CAREGIVER PLAY (OPTIONAL):

The goal of this activity is to provide an opportunity for the caregiver to show you how the child plays at home. This activity is optional based on parent comfort level. Preface this activity by asking the caregiver if the observation was representative of how their child typically plays and interacts at home or across environments. Observe whether child's behavior is significantly different during caregiver-led interactions.

Chapter 3:
Scoring and Interpretation

General Scoring Guidelines

After administration is complete, the provider uses the *ASD-PEDS Rating Form* to record a score for seven key behaviors based on observations of the child. No score is linked to any specific activity.

Each child is scored on seven key behaviors using Likert-ratings (1, 2, 3):

1. Socially directed speech and sounds,
2. Frequent and flexible eye contact,
3. Use of gestures and integration with eye contact and speech/vocalization,
4. Unusual vocalizations,
5. Unusual or repetitive play,
6. Unusual or repetitive body movements, and
7. Unusual sensory exploration or reaction.

A score of (1) is provided if observations in the specific area are not consistent with ASD. A score of (2) is provided if observations have some consistencies with ASD, but at subclinical levels. A score of (3) is provided if observations in the area are obviously consistent with autism. Specific scoring guidelines for each of the seven key behaviors are provided on the rating form. A total score is calculated and recorded by summing the child's Likert-style scores for each key behavior. For more detailed descriptions of how specific behaviors are scored, please see p. 28 in the Appendix (Detailed ASD-PEDS Scoring Guidelines) and example videos at triad.vumc.org/asd-peds.

Note: This tool is designed to help a provider observe and quantify the presence of autism characteristics during an evaluation. ASD-PEDS scores can be based on the totality of the provider's observations during the evaluation. This means that behaviors observed by the provider outside of the ASD-PEDS administration can be taken into consideration when scoring. For example, if a child does not engage in repetitive play during the ASD-PEDS administration but does engage in clear repetitive play as the provider is completing a clinical interview, this behavior may be considered in scoring.

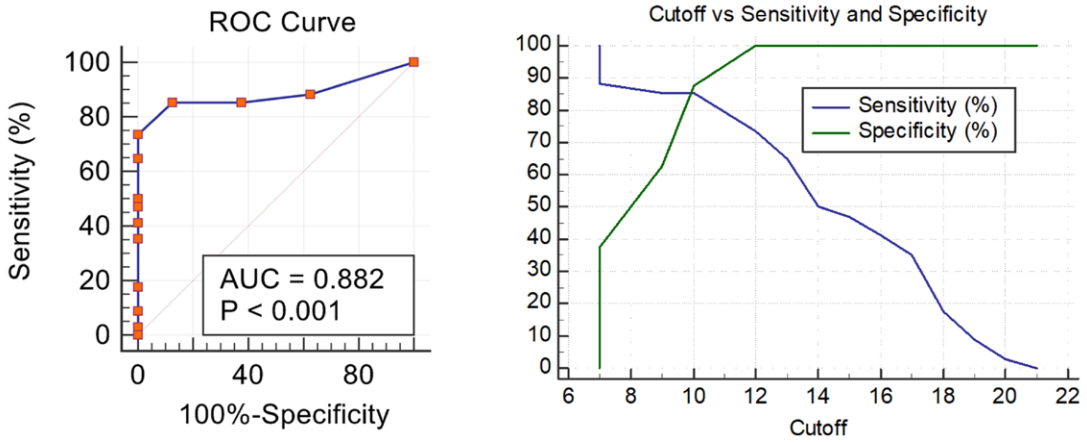
Determining ASD Classification

The *ASD-PEDS Rating Form* is intended to help providers organize their observations based on seven key behaviors. These observations, together with the total score, can inform clinical decision-making. The total score can also be used in determining an autism classification based on psychometric functioning.

Current use and research suggest that children who score **13 or higher** on the ASD-PEDS have a significantly increased likelihood of autism. This score was based on 1) recent data surrounding optimal cutoff scores for in-person administration by community pediatric providers, 2) the goal to establish a cutoff that would minimize false positives (maximize specificity) while maintaining appropriate sensitivity, and 3) the goal of identifying children with high likelihood to meet DSM-5 criteria for autism within community settings. For additional information regarding the development of the cutoff score for the ASD-PEDS, please see p. 18 in the Appendix.

Appendix

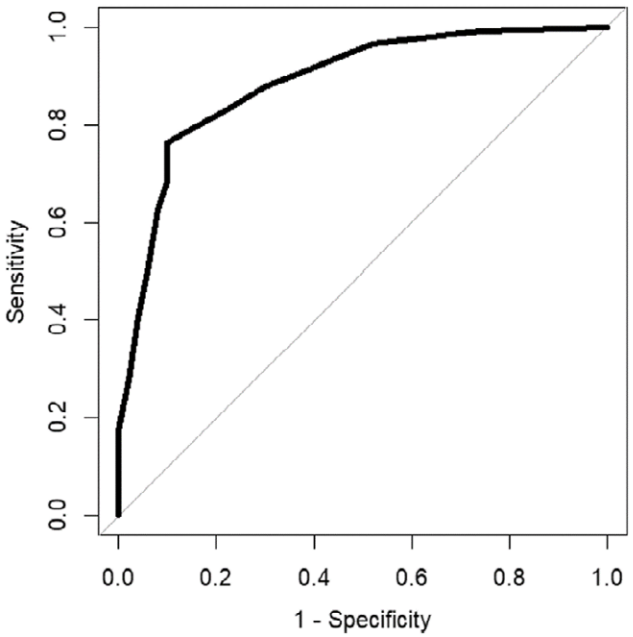
The administration guidelines and rating form that comprise the ASD-PEDS have been developed through multiple stages including use of an interactive app intended to guide in-person administration of brief autism assessment.[1-3] Data collected using this modality informed initial cutoff scores for use by specialist providers. The original sample[1] included 42 children (28 male, 14 female) between the ages of 16 and 39 months of age (M = 29.4, SD = 5.3) who received both a brief assessment using procedures very similar to the current version of the ASD-PEDS, as well as traditional, comprehensive ASD evaluations. A Receiver Operating Characteristic (ROC) curve analysis was conducted to determine the optimal cutoff score to discriminate between children at low and high risk of autism based upon results of comprehensive in-person evaluation. The instrument's output score ranges from 7-21 given the coding structure that includes 7 items, each with a 3-point response scale. Using comprehensive evaluation diagnosis as the binary target variable (i.e., 1 for ASD and 0 otherwise) and the total score as the predictor variable, we carried out a ROC curve analysis using MedCalc statistical analysis software (version 19.5.3) with default parameters.[3] The Area Under the Curve (AUC) measure was used to evaluate the overall performance of the instrument with respect to best estimate clinical diagnosis and the original cutoff was selected based on the Unweighted Average Recall (UAR) measures.[3]



A study completed in 2023 (R44MH115528, R43MH115528)[2,3] assessed the accuracy and psychometric properties of an earlier version of the ASD-PEDS through use of a tablet-based app (*Paisley*). A total of 198 toddlers between 18-37 months of age completed the ASD-PEDS activities in a clinical research setting. Providers administering the assessment activities using Paisley included 66 community providers with differing levels of familiarity with autism, including medical providers (e.g., pediatricians, nurse practitioners), speech pathologists, clinical psychologists, licensed psychological examiners, and developmental therapists. Participants then later completed traditional, in-person assessment using the Autism Diagnostic Observation Schedule (ADOS-2) as well as measures of developmental functioning (Mullen Scales of Early Learning and Vineland Adaptive Behavior Scales, 3rd Edition). Paisley scores were significantly higher for children diagnosed with autism (mean = 15.06) versus those not diagnosed (mean = 9.34).

The optimal cut-scores for Paisley and thus, the ASD-PEDS were calculated using Likert scoring procedures. The following indices were calculated at all possible cutoff points: sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and Youden's Index. Youden's index represents the likelihood of a positive test result among individuals with the condition versus individuals without the condition of interest (Zhou et al., 2011). Youden's index is calculated as the sum of the sensitivity and specificity minus one. To determine the effectiveness of alternative potential cutoffs, sensitivity, specificity, PPV, NPV, and Youden's Index were calculated and compared. Receiver operating characteristic (ROC) curves were used to examine the diagnostic accuracy of the ASD-PEDS administered via Paisley. The AUC can be interpreted as the probability that a randomly chosen child with a clinical diagnosis of autism would score higher on the ASD-PEDS administered via Paisley than a randomly chosen child without a clinical diagnosis of autism.

Analyses indicated a sensitivity and specificity of 0.83 (95% CI = 0.77–0.90) and 0.78 (95% CI = 0.67–0.90), respectively. The PPV was 0.92 (95% CI = 0.87–0.96) and the NPV was 0.61 (95% CI = 0.49–0.73). The ROC analyses indicated an AUC of 0.89 (95% CI: 0.83-0.94) with scores significantly different from chance level ($p < 0.001$). Using Youden's Index, the optimal cutoff point was found to be 13. Given that the goal of this study and modality of the ASD-PEDS was to enhance the ability of providers to identify children with a higher likelihood of having autism, with the additional aim of reducing the number of referrals to tertiary diagnostic centers regardless of presentation, greater weight was placed on specificity than sensitivity to minimize the occurrence of false positives. The specificity and positive predictive power using a cutoff score of ≥ 13 was significantly higher than the specificity associated with the cutoff scores from previous iterations/stages described above.



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ASD-PEDS
Administration Guidelines

The ASD-PEDS is a tool developed for the observation of autism characteristics in young children. It was designed to be administered flexibly and tasks/materials can be modified as needed for the provider to make meaningful observations. Please see the ASD-PEDS manual and website for detailed guidance on administration and scoring: triad.vumc.org/asd-peds.

The materials listed below are meant to be suggestions. Providers may substitute materials based on availability/resources and preferences of the child. Providers do not need to have all materials, only enough to be able to engage the child and administer each item.

MATERIALS

❏ PLAY MATERIALS
- Sensory toy (e.g., glitter wand, textured or noise-making ball)
- Pretend play (e.g., doll, animal/people figurines)
- Plastic cup and spoon
- Shape sorter/blocks
- Musical toy or sound maker

❏ REQUESTING MATERIALS
- Clear container with lid that closes tightly
- Preferred item(s) for container (e.g., small snack, sticker, small toy

❏ READY-SET-GO MATERIALS
- Ball
- Pop-rocket
- Car/truck/train
- Deflated balloon
- Flying disc launcher

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The administration guidelines include specific directions for each item as well as suggested behaviors to observe. Additional observations are provided below and should be considered throughout administration. All behaviors observed during the appointment can be considered in completion of the rating form.

GENERAL OBSERVATIONS

❑ SPEECH & SOUNDS
- Use of words or word approximations
- Directed or undirected
- Requests, sharing enjoyment, directing attention, chatting
- Atypical non-word noises, echolalia, scripting
- Atypical or repetitive intonation

❑ COORDINATING EYE CONTACT/GESTURES/SPEECH OR VOCALIZATIONS
- Gestures: pointing, reaching, clapping, beckoning
- Pairing or coordinating eye contact with sounds and gestures
- Hand-as-tool use or limited range of nonverbal communication (gestures, facial expressions) directed to others

❑ PLAY
- Playing with toys as designed/expected
- Pretend play either with figurines or other toys
- Imitating words/vocalizations or play actions in a social way
- Repetitive or unusual play: repeatedly pushing buttons, lining things up, scrambling/dropping toys, grouping/stacking

❑ BODY MOVEMENTS
- Hand flapping
- Posturing hands, fingers, or body
- Tensing
- Toe-walking
- Facial grimacing
- Hand/finger mannerisms
- Repetitive patterns of pacing/spinning/bouncing/jumping

❑ SENSORY DIFFERENCES
- Visual inspection
- Seeking out textures
- Mouthing/licking objects
- Sound/light/texture sensitivity
- Self-injury (e.g., scratching or biting self, head-banging)

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☐ FREE PLAY

Procedures: Lay out a few of the play toys (e.g., ball, blocks, sensory toy). Let the child play with the toys on his/her own. Can be at a table or on the floor. (2 minutes)

To caregiver: ***"I'm going to let [Child] play with these toys for a couple of minutes. Please just sit back and let him/her play. You can respond as you normally would if he/she tries to get your attention, but we will do our best to not tell him/her directly what to do."***

To child: ***"Here are some toys you can play with!"***

Social Communication behaviors - Check if observed

- ☐  Directs vocalizations
- ☐  Makes eye contact
- ☐  Uses gestures and combines them with EC/vocalizations to: REQUEST, DIRECT ATTENTION, SHARE ENJOYMENT

RRBs - Check if observed

- ☐  Unusual sounds, jargon, or speech
- ☐  Unusual or repetitive play
- ☐  Unusual or repetitive body movements
- ☐  Unusual sensory behaviors/interests

Observations:

☐ CALLING NAME #1

Procedures: During ***Free Play***, wait until the child is not looking at you and call child's name one time to get his/her attention. Can also have parent call child's name one time.

- ☐  Child makes eye contact when called.

Observations:

☐ DIRECTING ATTENTION #1

Procedures: During ***Free Play***, go near the child and get the child's attention, then point to something not directly in front of the child (picture, object) and say, ***"[Child], look!"*** Only say this one time.

- ☐  Child follows your point to look at object.

Observations:

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☐ JOINT PLAY/TURN-TAKING

Procedures: Join the child's play in whatever way feels natural. You can include new toys. Encourage the child to take turns by rolling a toy back and forth (e.g., ball/car). (2 minutes)

If the child does not begin playing with you, make multiple bids for his/her attention and to play with you.

Social Communication behaviors - Check if observed

- ☐  Directs vocalizations
- ☐  Makes eye contact
- ☐  Uses gestures and combines them with EC/vocalizations to: REQUEST, DIRECT ATTENTION, SHARE ENJOYMENT

RRBs - Check if observed

- ☐  Unusual sounds, jargon, or speech
- ☐  Unusual or repetitive play
- ☐  Unusual or repetitive body movements
- ☐  Unusual sensory behaviors/interests

Observations:

☐ CALLING NAME #2

Procedures: During ***Joint Play***, wait until the child is not looking at you and call child's name one time to get his/her attention. Can also have parent call child's name one time.

- ☐  Child makes eye contact when called.

Observations:

☐ DIRECTING ATTENTION #2

Procedures: During ***Joint Play***, go near the child and get the child's attention, then point to something not directly in front of the child (picture, object) and say, ***"[Child], look!"*** Only say this one time.

- ☐  Child follows your point to look at object.

Observations:

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☐ FAMILIAR PLAY ROUTINE

Procedures: Begin a familiar play routine such as peekaboo, chase, or another socially engaging game.

To caregiver: ***"Is there a game that you like to play with [Child] like peekaboo or "I'm gonna get you?" I'm going to play that game with him/her, but I might ask you to play with him/her as well."***

If the child will not engage with you, you can ask the caregiver to start the game with the child. You can allow this to go on for as long as it feels natural (1-2 minutes).

Social Communication behaviors - Check if observed

- ☐ Directs vocalizations
- ☐ Makes eye contact
- ☐ Uses gestures and combines them with EC/vocalizations to: REQUEST, DIRECT ATTENTION, SHARE ENJOYMENT

RRBs - Check if observed

- ☐ Unusual sounds, jargon, or speech
- ☐ Unusual or repetitive play
- ☐ Unusual or repetitive body movements
- ☐ Unusual sensory behaviors/interests

Observations:

☐ READY-SET-GO ROUTINE

Procedures: Use one of the Ready-Set-Go toys. Get the child's attention, say ***"Ready… set…go!"*** and then roll/activate/launch the object. Pause to give the child an opportunity to respond/interact/initiate the routine.

Repeat a total of three times, letting the child play with the item briefly before repeating.

Social Communication behaviors - Check if observed

- ☐ Directs vocalizations
- ☐ Makes eye contact
- ☐ Uses gestures and combines them with EC/vocalizations to: REQUEST, DIRECT ATTENTION, SHARE ENJOYMENT

RRBs - Check if observed

- ☐ Unusual sounds, jargon, or speech
- ☐ Unusual or repetitive play
- ☐ Unusual or repetitive body movements
- ☐ Unusual sensory behaviors/interests

Observations:

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☐ REQUESTING

Procedures: Use a clear container with a tight lid. Put small preferred item(s) in the container. Say, ***"Here you go, you can have it,"*** and give closed container to the child. Pause.

Repeat <u>two more times</u>, letting the child access the item(s) briefly before repeating.

Social Communication behaviors - Check if observed

- ☐  Directs vocalizations
- ☐  Makes eye contact
- ☐  Uses gestures and combines them with EC/vocalizations to: REQUEST, DIRECT ATTENTION, SHARE ENJOYMENT

RRBs - Check if observed

- ☐  Unusual sounds, jargon, or speech
- ☐  Unusual or repetitive play
- ☐  Unusual or repetitive body movements
- ☐  Unusual sensory behaviors/interests

Observations:

☐ IGNORING

Procedures: Re-present some of the toys and purposefully ignore the child while he/she is playing.

To caregiver: ***"I'm going to let [Child] play for a couple of minutes. During this time, we are going to ignore him/her to see if he/she will try to get our attention. You can respond as you normally would if he/she tries to get your attention.***" (1-2 minutes)

Social Communication behaviors - Check if observed

- ☐  Directs vocalizations
- ☐  Makes eye contact
- ☐  Uses gestures and combines them with EC/vocalizations to: REQUEST, DIRECT ATTENTION, SHARE ENJOYMENT

RRBs - Check if observed

- ☐  Unusual sounds, jargon, or speech
- ☐  Unusual or repetitive play
- ☐  Unusual or repetitive body movements
- ☐  Unusual sensory behaviors/interests

Observations:

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☐ CAREGIVER PLAY (OPTIONAL)

Procedures: Offer caregivers an opportunity to play with their child or show you a play routine from home.

To caregiver: ***"Was [Child]'s behavior during these activities similar to how he/she typically communicates, plays, and interacts? Is there a play routine that you do at home that you would like to show me?"***

Social Communication behaviors - Check if observed

- ☐  Directs vocalizations
- ☐  Makes eye contact
- ☐  Uses gestures and combines them with EC/vocalizations to: REQUEST, DIRECT ATTENTION, SHARE ENJOYMENT

RRBs - Check if observed

- ☐  Unusual sounds, jargon, or speech
- ☐  Unusual or repetitive play
- ☐  Unusual or repetitive body movements
- ☐  Unusual sensory behaviors/interests

Observations:

GENERAL OBSERVATIONS/NOTES

Please complete rating form.

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Child age: _____ mos
Gender: ☐ M ☐ F

ASD-PEDS Rating Form

VANDERBILT KENNEDY CENTER

Likert score: 1= Not consistent with ASD; 2= Some consistencies with ASD but at subclinical levels; 3= Obviously consistent with ASD

	Item	1	2	3	Likert 1/2/3
SOCIAL COMMUNICATION	**Socially directed speech and sounds**	Child often uses words or other vocalizations for a variety of social purposes (e.g. requesting, protesting, directing attention, sharing enjoyment).	Inconsistent socially directed speech.	Child does not often direct vocalizations (i.e., words, non-word sounds) to others. Most sounds are self-directed or undirected.	
	Frequent and flexible eye contact	Child makes frequent and spontaneous eye contact with others across a variety of activities.	Child's eye contact seems inconsistent. Gaze seems less flexible and harder to catch than expected.	Child infrequently makes eye contact. Might only make eye contact during one activity (e.g., asking for help, when being tickled). Does not look to others in response to name or other social bids.	
	Use of gestures and integration with eye contact and speech/ vocalization	Child's gestures are usually combined with vocalizations and eye contact. Child frequently points and uses other gestures to communicate. (e.g., waving, nodding/shaking head).	Child does not always look at others or make a sound when gesturing. Child may sometimes point or use other gestures, but less than expected.	Child does not usually gesture to communicate. May sometimes reach or point, but does not usually combine these with eye gaze or sounds. May move your hand or push on your body to get help.	
	Item	**1**	**2**	**3**	
RESTRICTED/REPETITIVE BEHAVIORS/INTERESTS	**Unusual vocalizations**	No unusual qualities of speech/ language observed. Most of child's vocalizations (i.e., words, non-word sounds) are appropriate for the child's developmental level.	Speech is not clearly unusual, but there are some differences (e.g., volume, slight repetitive quality of speech/language, unclear echoing, some occasional sounds that are unusual).	Child produces unusual jargon, sounds, or speech/language (e.g., undirected jargoning, peculiar intonation, unusual/ repetitive sounds or speech, echoing, scripting).	
	Unusual or repetitive play	Child plays with toys in appropriate ways (uses toys as expected for developmental level).	Child's play is not clearly unusual, but child is strongly focused on some toys, routines, or activities. May sometimes be hard to shift child's attention to something new.	Child shows clearly repetitive or unusual play (e.g., repeatedly pushing buttons, lining things up, or scrambling/dropping toys, grouping/stacking).	
	Unusual or repetitive body movements	No unusual or repetitive body movements seen.	Unclear unusual/repetitive body movements. Some repetitive jumping or very brief posturing of fingers, hands, or arms that is not clearly atypical.	Child clearly shows unusual or repetitive body movements (e.g., hand-flapping, posturing or tensing body, toe-walking, facial grimacing, hand/finger mannerisms, repetitive patterns of pacing/spinning/bouncing/jumping).	
	Unusual sensory exploration or reaction	No unusual sensory behavior observed.	Unclear sensory exploration or reaction. May have a brief response to a sound, smell, or how something feels or moves.	Child shows sensory differences. May closely inspect objects, overreact to sounds, show intense interest or dislike to textures (e.g., touching, licking, biting, refusing to touch specific toys), or clear self-injurious behavior.	

Did you recommend further evaluation for diagnostic clarification? ☐ Yes ☐ No	**ASD if forced to choose?** ☐ Absent ☐ Present	**How certain are you of your diagnostic impression?** ☐ 1 Completely uncertain ☐ 2 Somewhat uncertain ☐ 3 Somewhat certain ☐ 4 Completely Certain	**Cutoff score** 13 or higher= high likelihood of autism	**Total Score**
Diagnosis issued:				

Hine, J., Foster, T., Wagner, L., Corona, L., Nicholson, A., Stone, C., Swanson, A., Wade, J., Weitlauf, A., & Warren, Z. (2023).
ASD-PEDS: An Autism Evaluation Tool for Toddlers and Young Children. Vanderbilt University Medical Center. triad.vumc.org

GENERAL SCORING PROCESS

After administration and observations are complete, you will use the ASD-PEDS Rating Form to assign a rating for each of the seven key behaviors that are listed:

1. Socially directed speech and sounds
2. Frequent and flexible eye contact
3. Use of gestures and integration with eye contact and speech/vocalization
4. Unusual vocalizations
5. Unusual or repetitive play
6. Unusual or repetitive body movements
7. Unusual sensory exploration or reaction

You will consider each key behavior individually and decide whether each is:

- **Typically developing** or **not consistent with autism** (typically rated as a 1),
- **Clearly indicative of autism** (typically rated as a 3), or
- **Unclear/somewhere in between** (typically rated as a 2).

Brief scoring criteria related to each key behavior are provided on the rating form. In addition, detailed scoring guidelines (including more specific descriptions and examples) are provided in the next section below.

Of note, ratings should be based on your ***direct observations*** during the visit (which may include the child's behavior outside of the ASD-PEDS administration). For example, if a child does not engage in repetitive play during the ASD-PEDS administration, but visibly does so while you are interviewing the family, this behavior may be considered in scoring. This does not include behaviors that are solely reported and not observed. Caregiver report may inform the validity of your observations and should be incorporated into your diagnostic decision-making, but it should not be factored into your ratings on the ASD-PEDS.

Once each key behavior has been rated individually, you will obtain a total score by summing all 7 ratings. Current use and research suggest that children who score 13 or higher on the ASD-PEDS have an increased likelihood of autism. For additional information regarding this cutoff score, please see the ASD-PEDS Manual.

> *Remember that any evaluation outcomes, including diagnostic decisions, should be based on your clinical judgment and the totality of information available (including family report along with observed behaviors). Autism should not be diagnosed or ruled out solely based on the ASD-PEDS score.*

DETAILED SCORING GUIDELINES

The following guidelines are meant to supplement the brief criteria on the ASD-PEDS Rating Form and to better operationalize and differentiate between child behaviors meriting ratings of 1, 2, and 3. Detailed guidelines are given for each key behavior below, with corresponding video examples available for review at triad.vumc.org/asd-peds.

> *Please note that provided examples are not meant as exhaustive lists of all possible behaviors and autism characteristics you may encounter. In addition, there are many clinically relevant behaviors that may not be captured explicitly within ASD-PEDS ratings (e.g., social interactions and relationships, inflexibility around change and transitions, anxiety, behavior concerns) that should still be considered as part of your diagnostic decision-making.*

The ASD-PEDS **Social Communication** ratings can be thought of as "summary scores" that give an overall rating of observed behaviors across the entire visit. When completing these three ratings, consider this guiding question: ***Which scores best summarize your observations across the entire visit?*** Higher ratings within these domains indicate elevated concerns/differences related to social communication (e.g., decreased use of typical social communication skills).

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Socially directed speech and sounds	**Consider the *frequency* and *consistency* of the child's vocalizations (both speech and non-word sounds) and whether these are *directed to others in a social way* (vs. being directed to him-/herself or not to anyone in particular).** Consider only vocal language and sounds with this rating; signed words should be rated as gestures (see separate section below). • Assign a rating of 1 for a child who often uses spoken words/vocalizationsw for a variety of social purposes (e.g., not just to request, but also to direct attention, protest, comment/express interest to others, and/or share enjoyment socially). • Assign a rating of 2 for a child who socially directs vocalizations (as described above), but does not do so frequently or consistently. This rating is also appropriate for a child who uses vocalizations for a limited range of social purposes, who would not meet criteria for a rating of 1 or 3. It is also appropriate for a child who shows a mix of socially directed and undirected/self-directed vocalizations. • Assign a rating of 3 for a child who mostly vocalizes to him-/herself or to no one in particular. This would also include children who do not vocalize at all or make very few sounds overall. *Remember:* Consider a rating of 2 for a child who uses socially directed speech/sounds to clearly communicate with others on at least a few occasions.
Frequent and flexible eye contact	**Consider both the *frequency* of the child's eye contact and the *variety of situations/ activities* during which eye contact is observed.** • Assign a rating of 1 for a child who makes frequent, unprompted eye contact across a variety of different activities and situations (e.g., not just when requesting something, but also just to share attention and to be social). This would also include looking at the provider/parent while being spoken to, shifting their eye gaze from objects to others, and looking to others in reaction to exciting/surprising events. • Assign a rating of 2 for a child who sometimes makes eye contact but does not do so frequently or consistently. This rating is also appropriate for a child whose eye contact seems to be on his/her terms or to lack flexibility (e.g., makes eye contact when self-motivated, but not necessarily when others are trying to catch his/her gaze). This includes children who look to others to get their attention but do not consistently look up when others call their name or try to point things out. • Assign a rating of 3 for a child who infrequently makes eye contact and does not look up in response to name or other social bids (e.g., does not follow a point). This might include a child who only makes eye contact during one activity (e.g., when asking for help, or when being tickled). *Remember*: Consider a rating of 2 for a child who makes eye contact during at least a few activities, even if infrequent/inconsistent.
Use of gestures and integration with eye contact and speech/ vocalization	**Consider both the *range* and *frequency* of the child's gestures and whether these are *integrated/combined* with eye contact and vocalizations.** • Assign a rating of 1 for a child who frequently uses a range of gestures to communicate (e.g., pointing, waving, nodding/shaking head, clapping, signing, beckoning, shrugging toward others; giving others a "thumbs up," "high five," "fist bump," etc.; putting hands up to celebrate; patting a spot to indicate placement; flourishing hands to

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Use of gestures and integration with eye contact and speech/ vocalization (continued)	present something to others; miming for the purpose of communicating) AND combines them with vocalizations and eye contact *across the course of the observation*. Note that this does not require them to combine all three means of communication every time they gesture; for example, a child who rarely vocalizes but uses a range of gestures and integrates these with eye contact and/or infrequent sounds may still be given a rating of 1. This rating should not penalize a child who is not vocalizing, as long as their gestures and other forms of communication are well integrated. • Assign a rating of 2 for a child who sometimes uses gestures like the ones listed above, but does not do so frequently or in combination with eye contact or vocalizations. This rating is also appropriate for a child who uses a limited range of gestures, or who performs gestures independently but not to communicate with others. • Assign a rating of 3 for a child who does not use any gestures to communicate, or who infrequently uses very simple gestures (reaching, pointing) without integrating them with eye contact or vocalizations. This might include a child who communicates by physically directing others (such as by moving/placing others' hands on things or pushing/pulling them to a certain location or position, often without eye contact) – which is associated with autism and should *not* be considered a "gesture."

The ASD-PEDS **Restricted and Repetitive Behaviors and Interests** ratings can be thought of as indicators of any clear or possible repetitive/unusual vocalizations, play interests or activities, body movements, or sensory reactions or exploration throughout the visit. Any clear or possible examples of repetitive/unusual behaviors should be noted and rated accordingly, *regardless of the presence of other typical, expected behaviors*. When completing these four ratings, consider this guiding question: ***Did you see any of these clearly (or possibly) during the visit – even if you saw other things too?*** Higher ratings within these domains indicate elevated concerns/differences related to restricted and repetitive behaviors (e.g., increased presence of atypical behaviors).

Unusual vocalizations	**Consider the *quality* of the child's speech and vocalizations (including non-word sounds) apart from the frequency and complexity of their spoken language.** Note whether their ***wording, intonation, and sounds*** seem appropriate/expected for their developmental level. In particular, consider whether the child produces any repetitive or unusual vocalizations associated with autism, including: • Self-directed or undirected jargoning (non-word vocalizations that sound like the child's "own language," which may include repetitive/particular sound combinations like "ticka-ticka," "dugga-dugga," "gudda-gudda," etc.) » It is important to distinguish *jargon* (strings of "gibberish") *without a clear communicative purpose* from *babbling* (e.g., repetition of simple sounds like "ma" or "ba"), *articulation differences* (e.g., differences in how sounds are pronounced, which may interfere with understanding), and *word approximations with meaning* (e.g., "wa" for "water"). It may be helpful to ask families for clarification or "translation" to help you identify sounds and distinguish their meaning more clearly. However, be cautious about relying too heavily on assumed interpretations without clear evidence. • Unusual/unexpected sounds (e.g., growling, screeching, siren-like sounds, unnaturally high or low pitches, throaty/guttural sounds) • Repeating sounds or words "on a loop" or as "catchphrases" (e.g., saying them over and over, or repeatedly returning to the same sounds/phrases)

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Unusual vocalizations (continued)

- Repetitive/exaggerated tone patterns (e.g., repetitive rising and falling intonation, singsong tones)
- Echoing/copying words or sounds that they hear (either immediately or after a delay)
  - » When trying to distinguish echoing vs. social imitation, consider whether vocalizations are directed to others socially for a purpose, or if they're more to oneself. Consider if the child is echoing others' tone pattern/wording even if it doesn't fit the context (e.g., saying "You want car?" when you ask them, "Do you want the car?").
- Scripting (e.g., repeating/reciting lines from songs, videos, books, etc. or using memorized/rote phrases in a way that seems to lack spontaneity or flexibility/natural variation)
  - » Scripts may initially sound like spontaneous phrase speech. Note when phrases are repeated or said in a consistent way – such as with a consistent tone pattern, or in entire chunks vs. flexible/varied ways.
- Assign a rating of 1 for a child who does not exhibit any repetitive or unusual vocalizations, as described above. This may include children with limited repertoires of words/sounds (e.g., children who primarily babble or vocalize infrequently) if no repetitive or unusual qualities are noted. While it may be *atypical* for a child to use very few vocalizations, this characteristic of autism is rated separately above as part of "Socially directed speech and sounds." Also assign a score of 1 for children with more spoken language who do not exhibit any of the differences noted above.
- Assign a rating of 2 for a child who exhibits possible/unclear developmental differences in the quality of their vocalizations. These might include subtle differences in volume level or tone, slightly repetitive sounds or language, occasional unique or unusual sounds, or unclear echoing or scripting. Vocalizations that are clearly repetitive or unusual (as described above) should be rated a 3.
- Assign a rating of 3 for a child who exhibits clearly repetitive or unusual vocalizations associated with autism, as described above. Assign this rating *even if the child uses other more typical speech and sounds.*

Unusual or repetitive play

Consider the *quality* of the child's play, along with its *range* and *flexibility*. You will likely observe some typical, developmentally expected play actions (e.g., stacking blocks, pushing cars, pretend play actions with dolls or animal figures). While it is important to note these and to highlight them as skills, you should also pay specific attention to whether the child displays any of the following, which are associated with autism:

- Repetitive or particular play actions (e.g., repeatedly pushing buttons or activating parts of things – such as by spinning wheels, lining things up or arranging them in a particular way, scrambling/jumbling items or scattering them across surfaces, dropping/tossing/spinning items in a consistent manner, collecting items in piles or inside containers repeatedly, repeating specific actions or routines over and over with limited variation or flexibility)
- Unusual play interests and activities (e.g., unconventional interests in non-toy items)
- Focused interests or attachment to particular items/activities (e.g., intently focusing on specific interests – to the degree that it is difficult to catch the child's attention or redirect them; tendency to return to the same items/activities again and again; clear preferences for specific items – shown by holding/carrying them for extended periods or showing limited interest in other items)

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Unusual or repetitive play (continued)

- Assign a rating of 1 for a child who does not exhibit any repetitive or unusual play, as described above. This may include children who do not play/engage with toys *at all* (e.g., who explore/wander without playing or simply sit in their parent's lap), so long as no repetitive or unusual play is noted. Consider a rating of 2 for even slightly restricted, repetitive, or unusual play (e.g., only throwing/crashing).
- Assign a rating of 2 for a child whose play is not clearly unusual/repetitive, but who shows a focused interest in certain items, routines, or activities. This may include children with a very narrow range of play actions and interests (e.g., focused and restricted interest/interaction around a few specific items). It also includes children with possible/unclear repetitive or unusual play (e.g., very brief/isolated instances of unusual play). Play interests and activities that are clearly repetitive or unusual (as described above) should be rated a 3.
- Assign a rating of 3 for a child who exhibits any clear repetitive or unusual play associated with autism, as described above. This may include any clear examples of the above, even if they are observed only once (e.g., lining up/arranging items in an unmistakable manner). Assign this rating *even if the child displays other typical play interests and actions.*

Unusual or repetitive body movements

Consider whether the child displays any *repetitive or unusual body mannerisms or movements* apart from their general level of physical activity (e.g., children who are active but do not show repeated patterns or particular qualities of movement). To differentiate between repetitive play (above) and body movements, a general guideline might involve considering whether a toy/object was involved. Repetitive or unusual body movements associated with autism may include:

- Particular or unique body mannerisms (e.g., unique posturing/positioning of body parts, tensing up tight, finger flicking/crossing or other specific movements, facial grimacing/stretching, toe-walking, grinding teeth, etc.)
- Repetition of certain physical actions or patterns of movement (e.g., flapping hands, rolling/rotating/shaking body parts at joints, spinning in circles, repetitive rocking, pacing in a consistent way or along a consistent path, bouncing/jumping or moving in a specific or routinized way)

These body movements and mannerisms may occur when the child is experiencing strong emotions (e.g., excitement, upset) and may be combined with additional repetitive/unusual behaviors rated separately. They should be noted and rated whenever observed, independent of the specific circumstances that surround them.

- Assign a rating of 1 for a child who does not exhibit any repetitive or unusual body movements, as described above. Consider a rating of 2 for subtle/ambiguous differences or brief repetitive or particular movements that are not clearly atypical.
- Assign a rating of 2 for a child who exhibits ambiguous/unclear repetitive or unusual body movements. These might include jumping in place without other atypical posturing/movements, or isolated unique movements without any discernible pattern (e.g., brief posturing that is not clearly atypical or repetitive, a movement with a unique quality, rising up on toes one time when excited). Body movements and mannerisms that are clearly repetitive or unusual (as described above) should be rated a 3.

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Unusual or repetitive body movements (continued)

- Assign a rating of 3 for a child who exhibits any clearly repetitive or unusual body movements associated with autism, as described above. This may include any clear examples of the above, even if they are observed only once (e.g., flapping arms in an unmistakable manner).

Remember: Consider a rating of 2 when such behaviors are isolated and unclear.

Unusual sensory exploration or reaction

Consider whether the child displays any *unusual* sensory reactions or exploration associated with autism. This rating is not designed to account for all of the possible ways in which a child might explore the sensory world. Rather, it is intended to capture *atypical* or *unusual* sensory behaviors that are widely recognized as *characteristic of autism*, including:

- Sensory-focused exploration or sensory-seeking behaviors (e.g., inspecting items intently or closely, carefully watching things move at eye level, examining things out of the corners/sides of eyes, visibly rubbing/feeling items, repeatedly mouthing/licking/biting objects, pressing items to face or ears, clearly and repetitively seeking out specific/unusual sensory input from other items or people – such as by seeking deep pressure, licking/rubbing others or exploring/eating hair, crashing/humping in an unmistakable manner)
- Sensory differences or unexpected reactions (e.g., sensitivity to sounds, textures, lights, or physical contact/input; refusing to touch specific items; clearly atypical reactions to sensory input)
- Clear self-injurious behavior (e.g., hitting or biting self, banging head) – while not necessarily sensory-seeking or sensory reactive – also falls under the criteria/description for a rating of 3 on the ASD-PEDS. This does not necessarily have to occur when the child is upset (but may).

These sensory behaviors may be combined with additional repetitive/unusual behaviors rated separately. For example, if a child displays a complex combination of sensory exploration along with repetitive/unusual play, body movements, and vocalizations (e.g., lines up toys, then leans in to inspect them carefully while humming in a particular, self-directed way and posturing their fingers), it may be appropriate to rate each individual aspect accordingly.

- Assign a rating of 1 for a child who does not exhibit any unusual sensory exploration or reaction associated with autism, as described above. Consider a rating of 2 for subtle/ambiguous differences that are not clear.
- Assign a rating of 2 for a child who exhibits ambiguous/unclear sensory exploration or reaction. This might include brief, isolated responses to a sound, smell, or how something feels or moves. It might include less common or possible sensory differences not listed above; however, be cautious about relying too heavily on assumed interpretations without objective evidence. Unusual sensory exploration or reaction that is clearly observable (as described in the examples above) should be rated a 3.
- Assign a rating of 3 for a child who exhibits clear unusual sensory exploration or reaction associated with autism, as described above.

Remember: Consider a rating of 2 when such behaviors are unclear.

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