

SORF Manual

Systematic Observation of Red Flags of ASD (SORF)

Amy M. Wetherby, Juliann Woods, Charly Nottke, Sheri Stronach, Deanna Dow, & David McCoy



This manual includes an overview of the SORF—the *Systematic Observation of Red Flags of Autism Spectrum Disorder*, a description of the scoring procedures, psychometric features and cutoff scores, definitions for rating each item of the SORF, worksheets for rating behaviors from a clinical sample or a home observation, and a fillable score form that calculates total and domain scores for the Clinic and Home SORF, and a fillable score form for the SORF Home that autofills the *Autism Navigator 16 Early Signs of Autism* to share with families. See companion documents for Home Observation Guidelines for virtual recording for the Evaluator and the Family.

Overview of the SORF

The SORF is an observational measure designed to detect 22 red flags for ASD in toddlers based on DSM-5 diagnostic criteria, with 11 items from each domain—Impairment in Social Communication and Social Interaction (SC) and Restricted Repetitive Behaviors, Interests, and Activities (RRB). The initial version of the SORF included 29 items derived from DSM-IV diagnostic criteria and research on the early signs of ASD in young children (Wetherby et al., 2004). Items were revised or removed based on the initial research findings, and new items were added to capture additional behaviors and align with DSM-5 diagnostic criteria.

The **SORF—Clinic** was designed to be scored while watching a video recording of the *Behavior Sample* of the *Communication and Symbolic Behavior Scales Developmental Profile* (CSBS; Wetherby & Prizant, 2002) conducted in a clinical setting, which lasts approximately 20 minutes. The *CSBS Behavior Sample* is a standardized, norm-referenced instrument designed to measure early social communication skills in children 9-24 months of age as a follow-up to the *CSBS Infant-Toddler Checklist*, a parent-report screener for communication delay. The *CSBS Behavior Sample* provides a useful context to observe early red flags of ASD because it offers a brief systematic sample with structured and unstructured activities to observe both a lack of typical milestones of social communication development as well as the presence of unusual behaviors. Because the CSBS is often included as part of a communication evaluation to determine if there is a communication delay, the SORF may be an efficient rating to also identify early signs or symptoms of ASD. The SORF—Clinic was originally designed as a screening measure rather than a diagnostic tool to identify children who should be referred for a diagnostic evaluation by a professional with expertise in ASD. We are conducting ongoing research on the SORF—Clinic coded during the CSBS Behavior Sample and the SORF—Home coded during a guided Home Observation that may be used as a clinical observation of diagnostic symptoms of ASD to contribute information to make a clinical best estimate diagnosis. Following are details on the SORF scoring procedures and psychometric properties of the SORF—Clinic and SORF—Home.

SORF Scoring Procedures

The SORF is based on a 4-point rating with scores ranging from 0 to 3 as defined for each red flag. There are 11 red flags in each of the two domains of the DSM-5 diagnostic criteria for ASD—SC and RRB. A higher score indicates more red flags of ASD. For each item, a score of 0 indicates that the red flag was clearly not displayed, a score of 1 indicates that a trace of the red flag was displayed, a score of 2 indicates that the red flag was displayed but minimally, and a score of 3 indicates that the red flag was displayed robustly. Some behaviors are a lack of **typical behaviors** and a score of 0 indicates that the behavior is used often and a score of 3 indicates absence of the behavior. Other behaviors are **unusual or not expected in typical development** and a score of 0 indicates absence of the behavior and a score of 3 indicates that the behavior is displayed often (e.g., in at least 3 different activities, 4 times during the sample). In general, **few or rare** indicates that the behavior occurred 1 to 2 times, **some** indicates that the behavior occurred 3 to 4 times, and **several, often, or many** indicates that the behavior happened more than 4 times. A code of 8 is used for a few items to indicate when the behavior cannot be assessed because there is insufficient evidence (e.g., repetitive speech cannot be assessed if the child does not vocalize). Scores of 8 are converted to a 0 in the total and domain scores.

The SORF is scored during an ongoing interaction of the child and one or more adults. We have developed two worksheets to be used to rate behaviors during an observation, one for the CSBS Behavior Sample and one for the Home Observation, included in this manual. Experienced coders can rate behaviors in vivo or as they happen, but we recommend video recording observations for scoring in case items need to be checked. Video recordings may also provide additional clinical utility, as they can be used as a reference to build consensus with families on observed red flags and to collect baseline measures on social communication for treatment planning.

CSBS Clinic Sample: Use the standard sampling procedures of the CSBS Behavior Sample (Wetherby & Prizant, 2002) to collect a systematic observation in a clinical setting. Use the *SORF Worksheet for CSBS Behavior Sample* to score behaviors as they are observed by entering a plus or minus sign in the boxes under each of the following 8 activities presented during the CSBS:

1. Wind-up Toy & 1 st Toy in Bag	2. Balloon & 2 nd Toy in Bag	3. Bubbles & 3 rd Toy in Bag	4. Jar with Food & 4 th Toy in Bag
5. Books	6. Feeding Toy Set	7. Cooking Toy Set	8. Blocks

For items that are based on the number of occurrences in addition to or rather than the number of activities, such as Item 5: Poor eye gaze to face, make a slash every time this behavior occurs and count how many for each activity when tabulating the scores.

Home Observation: The guided *Home Observation* for families is designed to collect a naturalistic observation in the home when the parent of family member tries to engage the child in interaction during 6 different everyday activities for about an hour. The sample must be at least 30 minutes with at least 5 activities and the transitions between activities video recorded. See the companion documents with the Home Observation Guidelines for virtual recording with instructions for the Evaluator and instructions to give the Family in advance.

Use the *SORF Worksheet for Home Observation* included in this manual to score behaviors as they are observed by entering a plus or minus sign in the boxes for every 3-minute interval for up to 20 intervals for observation up to 60 minutes. For items that are based on the number of occurrences, such as Item 5: Poor eye gaze to face, make a slash every time this behavior occurs and count when tabulating the scores. Enter the **activity key** at the top of each column for 8 activity categories, using the following letter key:

T Play with Toys	Pr Play with Props	P Play with People	M Meals & Snacks
C Caregiving	B Book Sharing	F Family Chores	Tr Transitions

Play is divided into 3 categories to compare red flags during play with smaller toys, play with props or larger toys (e.g., big ball, toy slide), and play with people without toys. Autism symptoms such as poor eye gaze to face, repetitive behaviors, or excessive interest in objects may vary across these types of activities. The activity category entered is based on what the parent is trying to get the child to do. If there is a brief shift by the parent, stay with that activity. If the parent shifts for a minimum of one minute, then add the new category. Enter keys for all activities occurring in a 3-minute interval to document the activity or activities (i.e., up to 3 keys per 3-minute interval). Knowing the activity context can help to document if there are patterns of red flags in particular activities, which may be helpful in building consensus with families on the early signs of ASD and in intervention planning.

SORF Psychometric Features and Cutoff Scores

SORF—Clinic. Dow, Guthrie, Stronach, & Wetherby (2017) examined the psychometric properties of the SORF scored during the CSBS in a sample of 247 children 16 to 24 months of age: 130 with ASD, 61 with developmental delays, and 56 typically developing. Individual items were examined for performance to create an algorithm with improved sensitivity and specificity, yielding a total Composite score and Domain scores for SC and RRB. Codes indicating clear symptom presence were collapsed to yield a count of the Number of RF for the overall scale and each symptom domain. Results indicated significant group differences with large effects for the Composite, both Domain scores, and RF, and good discrimination (area under the curve=.84-.87) between ASD and nonspectrum groups for the Composite, SC Domain, SC RF, and total RF. The seventeen items with medium to large effect sizes and AUC values of at least .60 were included in an algorithm used to compute the Composite and SC and RRB Domain scores, providing continuous measures of ASD severity. Because the intended purpose of the RF scores is to provide diagnostically useful information about clinically significant behaviors, all 22 items were included in these scales. Including all items in the RF scales did not decrease sensitivity compared to including only algorithm items.

Recommended Cutoff Scores: Following are recommended cutoffs for the scores that are auto-filled in the boxes at the bottom of the *SORF Fillable Score Form*—the total Number of Red Flags, SC and RRB Domain Scores and the Composite Scores. Also presented are the area under the curve (AUC), Sensitivity or true positive rate, Specificity or true negative rate, Positive Predictive Value (PPV) and Negative Predictive Value (NPV) based on the ROC curve analysis (Dow et al., 2017):

SORF	Cutoff	AUC	Sensitivity	Specificity	PPV	NPV
Composite Score	20	0.87	0.80	0.78	0.81	0.78
SC Domain Score	14	0.85	0.80	0.72	0.76	0.76
RRB Domain Score	4	0.79	0.79	0.66	0.72	0.73
Number of Red Flags	8	0.86	0.79	0.75	0.78	0.76


These results indicate that the **SORF—Clinic** provides an observational measure for 16-24 month olds with good discrimination, sensitivity, and specificity. A cutoff of ≥ 20 on the Composite is recommended to be the optimal score to detect ASD risk. A cutoff of ≥ 8 Red Flags is close in accuracy and may be helpful when explaining ASD risk and sharing screening results with families.

SORF—Home. Dow, Taylor, Kutta, Nottke, & Wetherby (2020) examined the utility of the SORF as a level 2 screener for ASD in toddlers during a naturalistic video-recorded home observation. Psychometric properties of the SORF were examined in a sample of 228 toddlers—84 with ASD, 82 with developmental delay (DD), and 62 with typical development (TD). Trained undergraduate research assistants blind to diagnosis rated the 22 red flags of ASD associated with DSM-5 diagnostic criteria using a 4-point scale. The following scores were computed: a total score summing all items, domain scores summing social communication and restricted, repetitive behavior items, and number of red flag counting items with scores of 2 or 3 indicating clear symptom presence. The performance of the total, domain, and RF scores and individual items were examined. A composite score was formed with six items with the best psychometric performance: poor eye gaze directed to faces, limited showing and pointing, limited coordination of nonverbal communication, less interest in people than objects, repetitive use of objects, and excessive interest in particular objects, actions, or activities. The 6-item composite provides a brief measure with optimal performance, while the RF may be instrumental for clinicians who are interested in characterizing the range of observed symptoms. The SORF shows promise as a practical novel approach to currently available observational tools for implementation by nonexperts, that can be done virtually, with the potential to increase feasibility and reduce common obstacles to access to care.

Recommended Cutoff Scores: Following are recommended cutoffs for the scores that are auto-filled in the boxes at the bottom of the **SORF Fillable Score Form**—the total Number of Red Flags, SC and RRB Domain Scores and the Composite Scores. Also presented are the area under the curve (AUC), Sensitivity or true positive rate, Specificity or true negative rate, Positive Predictive Value (PPV) and Negative Predictive Value (NPV) based on the ROC curve analysis (Dow et al., 2020):

SORF	Cutoff	AUC	Sensitivity	Specificity	PPV	NPV
Composite Score	5	0.81	0.77	0.72	0.62	0.84
SC Domain Score	12	0.74	0.73	0.63	0.54	0.80
RRB Domain Score	2	0.68	0.70	0.54	0.47	0.76
Number of Red Flags	5	0.75	0.73	0.63	0.54	0.80

SORF Fillable Score Forms. Use the **SORF Fillable Score Form** to score each of the 22 red flags from 0 to 3. This fillable form sums the scores for you in boxes at the bottom of the form. Two different types of scores are generated. Scores on the best performing items are included in the total **Composite** scores. There are 17 of the 22 red flags that are noted with an asterisk (*) after the items on the **SORF—Clinic form** and 5 of the 22 on the **SORF—Home form**. The SC and RRB **Domain** scores include a sum of all 11 items in each domain. Scores indicating that the red flag is present (i.e., score of 2 or 3) are collapsed to yield a count of the **Number of Red Flags** (RF). All 22 items were included in the total RF symptom count. The Composite and Domain scores provide continuous measures of severity of ASD behaviors, while the number of RF provides diagnostically useful information about the presence or absence of clinically significant behaviors. Below is a thumbnail of the **SORF—Clinic** Fillable Score Form that is included to this manual.



Child's Name: _____
 Examiner: _____ Date: _____
 Setting: Clinic Sample (CSBS) Age: _____

Systematic Observation of Red Flags of Autism Spectrum Disorder (SORF)
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A. Impairment in Social Communication and Social Interaction	B. Restricted and Repetitive Patterns of Behavior, Interests, or Activities
1) Deficits in Social-Emotional Reciprocity	1) Repetitive and Stereotyped Behavior
1. Limited sharing warm, joyful expressions*	12. Repetitive movements with objects*
2. Flat affect or reduced facial expressions*	13. Repetitive movements or posturing of body
3. Limited sharing interests*	14. Repetitive speech or intonation*
4. Lack of response to name or social bids*	2) Excessive Adherence to Routines and Ritualistic Behavior
2) Deficits in Nonverbal Communication Used for Social Interaction	15. Ritualized patterns of behavior*
5. Poor eye gaze directed to faces*	16. Marked distress over change*
6. Limited use of conventional gestures—showing and pointing*	3) Restricted, Fixed Interests Abnormal in Intensity or Focus
7. Uses person's hand/body as a tool without gaze	17. Excessive interest in particular objects, actions, or activities*
8. Limited use of consonant sounds in vocal communication*	18. Clutches particular objects
9. Limited coordination of nonverbal communication*	19. Sticky attention to objects*
3) Deficits in Relationships with People Other than Caregivers	20. Fixed interests on parts of objects
10. Less interest in people than objects*	4) Hypo- or Hyper-Reactivity to Sensory Input or Unusual Sensory Interest
11. Limited sharing of reciprocal social play*	21. Lack of or adverse response to specific sounds, textures, or other sensory stimuli
Adapted from the DSM-5 Diagnostic Criteria for Autism Spectrum Disorder (American Psychiatric Association, 2013)	
22. Unusual sensory exploration/excessive interest in sensory aspects of environment*	
Number of Red Flags 0	SORF Composite* 0
Social Comm. Domain 0	Restricted Rep. Domain 0

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Below is a thumbnail of the **SORF—Home** Fillable Score Form that autofills the *Autism Navigator 16 Early Signs of Autism* to share with families. These are included to this manual.

FIRST WORDS PROJECT Child's Name: _____
 Examiner: _____ Date: _____
 Setting: Home Observation Age in months: _____

Systematic Observation of Red Flags of Autism Spectrum Disorder (SORF)
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A. Impairment in Social Communication and Social Interaction		B. Restricted and Repetitive Patterns of Behavior, Interests, or Activities	
1) Deficits in Social-Emotional Reciprocity		1) Repetitive and Stereotyped Behavior	
1. Limited sharing warm, joyful expressions		12. Repetitive movements with objects*	
2. Flat affect or reduced facial expressions		13. Repetitive movements or posturing of body	
3. Limited sharing interests		14. Repetitive speech or intonation	
4. Lack of response to name or social bids		2) Excessive Adherence to Routines and Ritualistic Behavior	
2) Deficits in Nonverbal Communication Used for Social Interaction		15. Ritualized patterns of behavior	
5. Poor eye gaze directed to faces*		16. Marked distress over change	
6. Limited use of conventional gestures—showing and pointing*		3) Restricted, Fixated Interests Abnormal in Intensity or Focus	
7. Uses person's hand/body as a tool without gaze		17. Excessive interest in particular objects, actions, or activities*	
8. Limited use of consonant sounds in vocal communication		18. Clutches particular objects	
9. Limited coordination of nonverbal communication*		19. Sticky attention to objects	
3) Deficits in Relationships with People Other than Caregivers		20. Fixated interests on parts of objects	
10. Less interest in people than objects*		4) Hypo- or Hyper-Reactivity to Sensory Input or Unusual Sensory Interest	
11. Limited sharing of reciprocal social play		21. Lack of or adverse response to specific sounds, textures, or other sensory stimuli	
Adapted from the DSM-5 Diagnostic Criteria for Autism Spectrum Disorder (<i>American Psychiatric Association, 2013</i>)			
Number of Red Flags	0	Social Comm. Domain	0
		Restricted Rep. Domain	0
		SORF Composite*	0

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Checklist of 16 Early Signs of Autism **16by16™**

THE EARLY SIGNS OF AUTISM UNFOLD FROM 9 TO 16 MONTHS

Autism NAVIGATOR™ The early signs of autism are easy to miss. Autism can be diagnosed by 18-24 months, but it's not usually diagnosed until 4-5 years. We developed a Checklist to help you detect autism before it's usually diagnosed.

This Checklist is a companion to our Lookbook, which illustrates the 16 early signs of autism that unfold from 9 to 16 months. Explore the Lookbook at BabyNavigator.com. You can also download, share, and print an 8-page version or a 1-page glimpse of *16 Early Signs of Autism by 16 Months*.

How to use this Checklist: Check yes or no for each early sign of autism that describes your child's behavior. You can click on each question to see photos of each early sign in the Lookbook. The number of early signs will be summed for you. Any one of these signs may not be a problem. But in combination, they may signal a need to conduct a screening or diagnostic evaluation.

Name: _____ Date: _____ Age in Months: _____ Filled Out By: _____

CHECKLIST OF EARLY SIGNS OF AUTISM

- Is it hard to get your baby to look at you?
- Does your baby rarely share enjoyment with you?
- Does your baby rarely share their interests with you?
- Does your baby rarely respond to their name or other bids for interaction?
- Does your baby show a limited use of gestures such as showing and pointing?
- Is it hard for your baby to look at you and use a gesture and sound?
- Does your baby do little to no imitating of other people or pretending?
- Does your baby use your hand as a tool?
- Is your baby more interested in objects than people?
- Does your baby have unusual ways of moving their fingers, hands, or body?
- Does your baby repeat unusual movements with objects?
- Does your baby develop rituals and get very upset over change?
- Does your baby have an excessive interest in particular objects or activities?
- Is your baby very focused on or attached to unusual objects?
- Does your baby have unusual reactions to sounds, sights, or textures?
- Does your baby show interest in unusual sensory experiences?

Total Number of Early Signs of Autism: 0

WHAT IF YOUR CHILD SHOWS SOME EARLY SIGNS OF AUTISM?
 If your child shows 4 or more of these early signs, use our free online SoCo CheckUp for children 9-18 months to screen your baby for autism.
 If your child shows 8 or more of these early signs, ask your doctor for a referral for a diagnostic evaluation.
 Talk to your child's doctor or teacher about any of these early signs or contact your local early intervention program. Share this Checklist with them.

Baby NAVIGATOR™ BABY NAVIGATOR — WHAT EVERY PARENT NEEDS TO KNOW
 Go to BabyNavigator.com to find out what every parent needs to know about early learning. What you do and say can make all the difference.

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Definitions of SORF Items

IMPAIRMENT IN SOCIAL COMMUNICATION AND SOCIAL INTERACTION

REMEMBER: Each rating must meet all criteria for that red flag or assign the score below it.

1. Limited sharing warm, joyful expressions with directed eye gaze

Child does not use clear facial expression of pleasure, joy, or excitement (large smiles) directed toward a person with eye gaze to express warmth, genuine joy, or enjoyment **to draw attention to self or share enjoyment**. Fleeting gaze with facial expression is not credited. Eye gaze must be directed to a person's face with a moment of lingering to share enjoyment.

0	1	2	3
Warm, joyful smiles shared with directed gaze across four or more activities	Warm, joyful smiles with gaze to face in three activities	Warm, joyful smiles with gaze to face in one or two activities	No clear and joyful facial expressions directed to people

2. Reduced facial expressions

Child displays a lack of or limited change in facial expression or exhibits a distinctly flat affect. Child must lack a variety of or multiple changes of facial expressions of affect rather than only facial movements (e.g. a child opening and closing the mouth while pretending to eat is not counted). Positive facial expressions include happy, content, surprise, and excited looks. Negative facial expressions include protests, wariness, fear, and anger.

0	1	2	3
Exhibits at least four changes from neutral expression, with at least two positive facial expressions in at least three different activities	Exhibits three changes from neutral, with one positive facial expression, in at least two different activities	Exhibits two changes from neutral, with one positive facial expression	One or no affect changes or only shows negative affect

3. Limited sharing interests

Child does not use communicative signals to direct a person's attention to objects, actions, or events of interest (also referred to as initiating joint attention), by using at least two of the following three signals: eye gaze, gesture, or sound. Sharing an interest is defined as using a communicative signal to show, bring attention to, or point out something interesting to share with others. Interests are considered different if the topic or object is unique and independent (e.g., a car and a balloon), whereas similar objects should be considered one interest (e.g., two types of cars). For book sharing, each book should be coded as one interest.

0	1	2	3
Uses signals to share four different interests with others	Uses signals to share three different interests with others	Uses signals to share two interests with others	One or no signals to share interests with others

4. Lack of response to name when called

When called by a person, the child does not respond to their name by turning toward or looking at the person. The child's response must be immediate. The child's name must be presented with no other active or significant contextual cues (e.g., gesture, sound effect, touching the child, leaning in close to the child, other words or instructions following the name) to be considered an opportunity for response to name. The child cannot be already looking at the person. Do not count if the child's name is being said but they are not being asked to respond (e.g., good job, Johnny). Code 8 if name is not called 2 or more times.

0	1	2	3	8
Child looks toward person in response to name most of the time and at least three times	Child looks towards person in response to name half of the time and at least two times	Child looks towards person in response to name one time	No response to name	Name not called more than once; insufficient to judge

5. Poor eye gaze to face

Child does not direct gaze to others' faces. Eye gaze **must be directed to a person's face** for a lingering and connected moment. Eye gaze is alternating or shifting gaze to a person or between a person and an object. Do not credit gaze directed to another body part (e.g. hands) or fleeting gaze.

0	1	2	3
Directs gaze to face five times per activity, in at least four activities	Directs gaze to face four times per activity, in three activities	Directs gaze to face three times per activity, in one or two activities	Directs gaze to face two or fewer times per activity

6. Limited use of showing and pointing

Child has limited use of the showing gesture (i.e., holding an object out toward another person to reference another's attention to the object) and pointing gesture (i.e., use of the child's index finger to reference another's attention to an object, picture, or event). **Show does not need to be coordinated with gaze, but must be clearly oriented and directed to another person.** A give can follow a credited show, but it must be a clear show of the object that happens as a separate communicative signal with a pause before the give. A pointing gesture can be a contact or distal point. Points without a fully extended index finger are not credited. **Point MUST have eye gaze** directed to a person immediately before, during, or after the point. May or may not have coordinated vocalization.

0	1	2	3
Uses both showing and pointing at least once and uses either five or more times	Uses both showing and pointing at least once and uses either three or four times	Uses either showing or pointing two times	Uses one or no pointing or showing

7. Using person's hand or body as a tool without eye gaze

Takes, moves, or pulls another person's hand or body part as if it was a tool without using eye gaze; either places a hand on an object, pulls hand toward an object or body part, or manipulates a hand that is holding an object (e.g., pulling hand to lid of jar, pushing hand holding balloon up to the person's mouth, pulling hand to child's shoulder for a comfort pat). Do not count push away or brushing—needs to have evidence of using the hand as a tool.

0	1	2	3
No use of hand or body as a tool	Unclear attempts to use hand or body as a tool or coordinates with gaze	Uses hand or body as tool without gaze one time	Uses hand or body part without gaze as a tool two or more times

8. Limited use of consonants in vocal communication

Use of consonant sounds as a communicative signal that is directed using eye gaze to face, movement toward another person, or a gesture. The consonant sound can come slightly before, during, or slightly after the eye gaze, movement, or gesture. Consonant sounds must include a vowel as well as a consonant (e.g. 'ma' is credited but 'mm' is not). Look for mouth opening to determine if there is a vowel. Consonant sounds may occur at the beginning (e.g. 'ma'), middle (e.g. 'ahboo'), or end (e.g. 'up') of a vocalization. Only the following consonants should be credited: [m] [n] [b] [p] [d] [t] [g] [k] [w] [l] [y] [s] [sh].

0	1	2	3
Uses at least four different consonant sounds to communicate	Uses three different consonant sounds to communicate	Uses two different consonant sounds to communicate	Uses one or no consonant sounds to communicate

9. Limited coordination of nonverbal communication (gaze, facial expression, gestures, and sounds)

Deficits in communication due to the lack of coordination of at least 3 of the following 4 behaviors used as communicative signals simultaneously: (1) gaze to face, (2) facial expression, (3) gesture, and (4) sound. For the three behaviors to be simultaneous, they must occur all at once for at least a moment, though any of the behaviors could start before or end after the moment of coordination of all three. Facial expression must be a clear expression of affect. The sounds do not need to include a consonant but should exclude nonspeech sounds like laughs, cries, and raspberries.

0	1	2	3
Four or more instances of coordinated behaviors to communicate	Three instances of coordinated behaviors to communicate	One or two instances of coordinated behaviors to communicate	No coordinated behaviors to communicate

10. Less interest in people than objects

The child is less interested in people than objects **when objects are available**. Interest in people is evident by demonstration of the following: **gaze** to a person's face, **shifts orientation** from objects to a person, **responds to bids** for interaction while manipulating objects (does not need to demonstrate comprehension), or **initiates communication**. Less interest in people is evident by looking at, touching, or using any objects without showing interest in people.

0	1	2	3
Interest in people when objects are available at least 3/4 of the time in at least four activities	Interest in people when objects are available half of the time in three activities	Shifts attention from objects to people a few times in two activities	Does not demonstrate interest in people when objects are available or shifts attention in only one activity

11. Limited sharing of reciprocal social play

Child does not show reciprocal, shared play actions with another person. Reciprocal, shared play is evident by **directing functional actions used towards other people in play** (e.g., feeding parent with a spoon), **sharing attention while using play actions** (e.g., feeding a stuffed animal and looking to other person, dropping an object and looking toward another person in a playful game), or **reciprocal turn-taking in play with objects** (e.g., rolling a ball back and forth several times with anticipation of the next turn and sharing enjoyment). Do not code actions that are physical play (e.g., tickle game or "I'm gonna get you").

0	1	2	3
Four or more instances of sharing reciprocal social play	Two or three instances of sharing reciprocal social play	One instance of sharing reciprocal social play	No sharing of reciprocal social play

REPETITIVE MOVEMENTS & RESTRICTED INTERESTS

12. Repetitive movements with objects

Repetitive movements with objects include: **swipes** object; **rubs or squeezes** object; **rolls or knocks over** to roll object; **rocks, flips, turns over, or flicks** object; **spins or wobbles** object; **collects** objects; **moves or places** objects to one location; or **lines up or stacks** objects. One repetitive movement is defined as the same movement repeated at least 3 consecutive times (3 back-and-forth swipes, 3 knocks down and rolls) or the same action repeated with at least 3 different objects (collects 3 or more toys, lines up 3 or more toys).

0	1	2	3
No repetitive movements with objects	Unclear repetitive movements with objects	At least one clear instance of repetitive movements with objects	Two or more clear instances of repetitive movements with objects

13. Repetitive movements or posturing of body, arms, hands, or fingers

Repetitive movements with body include: **flaps** hands or arms (up-and-down movements of the hand, wrist, or arm); **rubs** body part (back-and-forth, sideways, or circular rubs on any of the child's body part with one or both hands or fingers); **pats, taps, or presses** body part (one or more fingers or hands contacting and releasing or flicking away from a body part); or **stiffens or unusual posturing** of fingers, hands, or arms. A repetitive movement is defined as at least 3 consecutive movements for all except stiffens or posturing, which can occur in isolation (usually with visible physical tension). Note: Trunk stability should be considered when assessing younger children as they may hold arms out for balance and support to sit up.

0	1	2	3
No repetitive movements or posturing of body	Unclear body movements or posturing which may be repetitive	One or two repetitive movements or posturing of body	Three or more repetitive movements or posturing of body

14. Unusual intonation and repetitive sounds

Repetitive or stereotyped speech that contains sounds that are produced at least 3 times in a row or close in time, or speech that is characterized by unusual intonation. Unusual intonation is evidenced by: **odd intonation** (monotonous, inappropriate stress, flat or mechanical sounding), **unusual pitch** (too low or high), **irregular rhythm** (stiff or jerky), or **unusual voice quality** (too soft or loud for the context). Code any occurrence of unusual intonation as a 1, 2, or 3. If the child uses less than 5 vocalizations that contain one or more sounds (vowel or vowel plus consonant combinations) with no unusual intonation, code an 8.

0 No vocalizations with repetitive or unusual intonation	1 Unclear repetitive speech or intonation or use of slightly unusual intonation	2 One or two instances of repetitive speech or unusual intonation	3 Three or more uses of repetitive speech or unusual intonation	8 Insufficient vocalizations to judge
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15. Ritualistic patterns of behavior

Ritualistic patterns of behaviors as evidenced by a sense of insistence on sameness, completeness, deliberateness, or precision (must be an identical pattern of at least 2 steps 3 times). Must include **evidence of a clear ritual**, for example unwillingness to complete a sequence or behavior in a different way, or repeated insistence on carrying out the same pattern of behavior.

0 No ritualistic patterns of behavior	1 Unclear ritualistic patterns of behavior	2 One instance of clear ritualistic patterns of behavior	3 More than one instance of clear ritualistic patterns of behavior
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16. Marked distress over change

Intense distress when an **object is removed** (e.g., toy, food), an **ongoing activity is ended**, or an **unexpected or unwanted change occurs** within an activity (e.g., blocks fall down). Distress must be strong in intensity and prolonged—at least 30 seconds from the initial distress to the point of recuperating from distress (shifting from dysregulation to a neutral or positive emotional state) and must be more than just protesting.

0 No distress over change	1 Distress over change that is not strong in intensity or that is brief (recuperates in less than 30 seconds)	2 One or two episodes (> 30 seconds) of marked distress over change	3 More than two episodes (> 30 seconds) of marked distress over change or one major meltdown (> 2 minutes) with a hard time recuperating
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17. Excessive interest in particular objects or actions

Excessive interest that is evident in the child being overly focused on, preoccupied or consumed with, or intensely interested in a particular object or set of objects (e.g., spoons, musical toy, strip of cloth, particular toy car.), actions (e.g., intensely interested in making things spin or wobble), or activities (dump & fill, books, iPad). The child holds, checks, or manipulates one object **in the absence of other actions with the object** for more than 10 seconds while exhibiting at least one of the following: **difficulty shifting attention away** from the object or action, **resistance to a new action** or activity, **unwillingness to release** the object, **fussiness over removal** of the object, or **returning to the same interest** two or more times during the sample. If child has not shifted from an episode of sticky attention for more than 60 seconds, then it can also be coded as excessive interest.

0 No excessive interest	1 Interest in specific objects or actions that is not excessive	2 One or two episodes of clear excessive interest in objects or actions	3 More than two episodes of excessive interest in objects or actions OR one extended episode that clearly interferes with interactions with others
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18. Clutches particular objects

The child holds onto an object from the previous toy set and will not release the object easily with either an offer of a new object or at least one serious attempt by a person to remove the object. The child either **holds the object tightly** for a period of time OR **tends to the object** by looking at it or repositioning it.

0	1	2	3
No clutching	Unclear instance of clutching object (e.g., child holds object across activities but easily releases) or clutches once	Two instances of clutching object	Three or more instances of clutching object(s)

19. Sticky attention to objects

The child does not shift gaze away from an available object within 10 seconds. An **object is available** if it is within the child's reach or in the child's control. Generally, sticky attention to a specific object is coded when an object is first presented or encountered or when there is an exchange of objects and the object is presented again. If the child looks away from an available object to anywhere in the room within 10 seconds, then it does not count as sticky attention. The child does not need to look at a person. Consider coding an episode of sticky attention under excessive interest (item 17) if the criteria are also met for that code.

0	1	2	3
No sticky attention	Unclear sticky attention (e.g., gaze stays on object slightly longer than typical) or one instance of sticky attention	Two instances of sticky attention	Three or more instances of sticky attention

20. Fixated interests on parts of objects

The child displays a narrow focus on or preoccupation with parts of objects evidenced by **visual attention to part of object for an extended period** of time OR **repeated or prolonged manipulation** of parts of objects (e.g., wheels of cars, lid, character feet). This may include toys, clothing, or body parts (e.g., rubbing ear).

0	1	2	3
No fixation on parts of objects	Interest in parts of objects that is not fixated	One or two instances of clear fixation on parts of objects	More than two instances of fixation on parts of objects

21. Adverse response to specific sounds, textures, or other sensory stimuli

The child displays oversensitivity to sensory input including **auditory** (e.g., holding hands over ears in response to a sound), **visual** (e.g., squinting in response to normal lighting, gagging when see or touch something), or **tactile** (e.g., pulling hand away from object with unusual texture) sensory stimuli.

0	1	2	3
Typical sensory reactions	Unclear sensory reactions	One or two instances of unusual sensory reactions	More than two unusual sensory reactions

22. Unusual sensory exploration or excessive interest in sensory aspects of environment

The child displays unusual, detailed, or prolonged sensory interest in the form of **touch/tactile** (e.g., rubs to feel texture), **visual** (e.g., stares or fixates, side peering), **oral** (e.g., licks object with tongue protruded), or **auditory** (e.g., leaning head close to object to hear sound).

0	1	2	3
No sensory interest	Unclear sensory interest	One or two instances of unusual sensory interests	More than two unusual sensory interests

SORF—Clinic Worksheet for CSBS Behavior Sample

Child's Name: _____ Date: _____ Examiner: _____

	1	2	3	4	5	6	7	8
Sampling Opportunity	Windup Toy	Balloon	Bubbles	Jar	Books	Play	Comprehension	Blocks
Impairments in Social Communication and Social Interaction								
1. Limited sharing warm, joyful expressions								
2. Flat or reduced facial expressions								
3. Limited sharing interests								
4. Lack of response to name or social bids								
5. Poor eye gaze directed to faces								
6. Limited use of conventional gestures---showing & pointing								
7. Uses person's hand/body as a tool without gaze								
8. Limited use of consonant sounds in vocal communication								
9. Limited coordination of nonverbal communication								
10. Less interest in people than objects								
11. Limited sharing of reciprocal social play								
Restricted and Repetitive Patterns of Behavior, Interests, or Activities								
12. Repetitive movements with objects								
13. Repetitive movements or posturing of body								
14. Repetitive speech or intonation								
15. Ritualized patterns of behavior								
16. Marked distress over change								
17. Excessive interest in particular objects, actions, or activities								
18. Clutches particular objects								
19. Sticky attention to objects								
20. Fixated interests on parts of objects								
21. Lack of or adverse response to specific sensory stimuli								
22. Unusual sensory exploration								



Child's Name: _____

Examiner: _____ Date: _____

Setting: Clinic Sample (CSBS) Age: _____

Systematic Observation of Red Flags of Autism Spectrum Disorder (SORF)

Amy M. Wetherby, Juliann Woods, Charly Nottke, Sheri Stronach, Deanna Dow, & David McCoy

A. Impairment in Social Communication and Social Interaction		B. Restricted and Repetitive Patterns of Behavior, Interests, or Activities					
1) Deficits in Social-Emotional Reciprocity		1) Repetitive and Stereotyped Behavior					
	1. Limited sharing warm, joyful expressions*		12. Repetitive movements with objects*				
	2. Flat affect or reduced facial expressions*		13. Repetitive movements or posturing of body				
	3. Limited sharing interests*		14. Repetitive speech or intonation*				
	4. Lack of response to name or social bids*	2) Excessive Adherence to Routines and Ritualistic Behavior					
2) Deficits in Nonverbal Communication Used for Social Interaction			15. Ritualized patterns of behavior*				
	5. Poor eye gaze directed to faces*		16. Marked distress over change*				
	6. Limited use of conventional gestures—showing and pointing*	3) Restricted, Fixated Interests Abnormal in Intensity or Focus					
	7. Uses person's hand/body as a tool without gaze		17. Excessive interest in particular objects, actions, or activities*				
	8. Limited use of consonant sounds in vocal communication*		18. Clutches particular objects				
	9. Limited coordination of nonverbal communication*		19. Sticky attention to objects*				
3) Deficits in Relationships with People Other than Caregivers			20. Fixated interests on parts of objects				
	10. Less interest in people than objects*	4) Hypo- or Hyper-Reactivity to Sensory Input or Unusual Sensory Interest					
	11. Limited sharing of reciprocal social play*		21. Lack of or adverse response to specific sounds, textures, or other sensory stimuli				
Adapted from the DSM-5 Diagnostic Criteria for Autism Spectrum Disorder (<i>American Psychiatric Association, 2013</i>)			22. Unusual sensory exploration/excessive interest in sensory aspects of environment*				
Number of Red Flags	0	Social Comm. Domain*	0	Restricted Rep. Domain*	0	SORF Composite*	0

SORF Worksheet for Home Observation

Child's Name: _____ Date: _____ Setting: _____ Examiner: _____

3-Minute Intervals	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	KEY	
Activity Categories																						KEY
Impairments in Social Communication and Social Interaction																					T	
1. Limited sharing warm, joyful																						Play with Toys
2. Flat or reduced facial expressions																						
3. Limited sharing interests & enjoyment																						Pr
4. Lack of response to name																						Play with Props
5. Poor eye gaze directed to faces																						
6. Limited gestures--showing & pointing																						P
7. Uses person's hand/body as a tool																						Play with People
8. Limited use of consonant sounds: m, n, b, p, d, t, g, k, w, l, y, s, sh																						
9. Limited coordination of nonverbal																						M
10. Less interest in people than objects																						Meals & Snacks
11. Limited sharing of imaginative play																						
Restricted and Repetitive Patterns of Behavior, Interests, or Activities																					C	
12. Repetitive movements with objects																						Care- giving
13. Repetitive movements of body																						
14. Repetitive speech or intonation																						B
15. Ritualized patterns of behavior																						Book Sharing
16. Marked distress over change																						
17. Excessive interest																						F
18. Clutches particular objects																						Family Chores
19. Sticky attention to objects																						
20. Fixated interests on parts of objects																						Tr
21. Lack of or adverse response sensory																						Transi- tions
22. Unusual sensory exploration																						



Child's Name: _____

Examiner: _____

Date: _____

Setting: Home Observation

Age in months: _____

Systematic Observation of Red Flags of Autism Spectrum Disorder (SORF)

Amy M. Wetherby, Juliann Woods, Charly Nottke, Sheri Stronach, Deanna Dow, & David McCoy

A. Impairment in Social Communication and Social Interaction				B. Restricted and Repetitive Patterns of Behavior, Interests, or Activities			
1) Deficits in Social-Emotional Reciprocity				1) Repetitive and Stereotyped Behavior			
	1. Limited sharing warm, joyful expressions				12. Repetitive movements with objects*		
	2. Flat affect or reduced facial expressions				13. Repetitive movements or posturing of body		
	3. Limited sharing interests				14. Repetitive speech or intonation		
	4. Lack of response to name or social bids			2) Excessive Adherence to Routines and Ritualistic Behavior			
2) Deficits in Nonverbal Communication Used for Social Interaction					15. Ritualized patterns of behavior		
	5. Poor eye gaze directed to faces*				16. Marked distress over change		
	6. Limited use of conventional gestures—showing and pointing*			3) Restricted, Fixated Interests Abnormal in Intensity or Focus			
	7. Uses person's hand/body as a tool without gaze				17. Excessive interest in particular objects, actions, or activities*		
	8. Limited use of consonant sounds in vocal communication				18. Clutches particular objects		
	9. Limited coordination of nonverbal communication*				19. Sticky attention to objects		
3) Deficits in Relationships with People Other than Caregivers					20. Fixated interests on parts of objects		
	10. Less interest in people than objects*			4) Hypo- or Hyper-Reactivity to Sensory Input or Unusual Sensory Interest			
	11. Limited sharing of reciprocal social play				21. Lack of or adverse response to specific sounds, textures, or other sensory stimuli		
Adapted from the DSM-5 Diagnostic Criteria for Autism Spectrum Disorder (<i>American Psychiatric Association, 2013</i>)					22. Unusual sensory exploration/excessive interest in sensory aspects of environment		
Number of Red Flags	0	Social Comm. Domain	0	Restricted Rep. Domain	0	SORF Composite*	0

Checklist of 16 Early Signs of Autism



THE EARLY SIGNS OF AUTISM UNFOLD FROM 9 TO 16 MONTHS



The early signs of autism are easy to miss. Autism can be diagnosed by 18-24 months, but it's not usually diagnosed until 4-5 years. We developed a Checklist to help you detect autism before it's usually diagnosed.

This Checklist is a companion to our Lookbook, which illustrates the 16 early signs of autism that unfold from 9 to 16 months. Explore the Lookbook at BabyNavigator.com. You can also download, share, and print an 8-page version or a 1-page glimpse of *16 Early Signs of Autism by 16 Months*.

How to use this Checklist: Check yes or no for each early sign of autism that describes your child's behavior. You can click on each question to see photos of each early sign in the Lookbook. The number of early signs will be summed for you. Any one of these signs may not be a problem. But in combination, they may signal a need to conduct a screening or diagnostic evaluation.



Name: Date: Age in Months: Filled Out By:

CHECKLIST OF EARLY SIGNS OF AUTISM

1. Is it hard to get your baby to look at you?
2. Does your baby rarely share enjoyment with you?
3. Does your baby rarely share their interests with you?
4. Does your baby rarely respond to their name or other bids for interaction?
5. Does your baby show a limited use of gestures such as showing and pointing?
6. Is it hard for your baby to look at you and use a gesture and sound?
7. Does your baby do little to no imitating of other people or pretending?
8. Does your baby use your hand as a tool?
9. Is your baby more interested in objects than people?
10. Does your baby have unusual ways of moving their fingers, hands, or body?
11. Does your baby repeat unusual movements with objects?
12. Does your baby develop rituals and get very upset over change?
13. Does your baby have an excessive interest in particular objects or activities?
14. Is your baby very focused on or attached to unusual objects?
15. Does your baby have unusual reactions to sounds, sights, or textures?
16. Does your baby show interest in unusual sensory experiences?

Total Number of Early Signs of Autism:

WHAT IF YOUR CHILD SHOWS SOME EARLY SIGNS OF AUTISM?

If your child shows 4 or more of these early signs, use our free online [SoCo CheckUp](#) for children 9-18 months to screen your baby for autism.

If your child shows 8 or more of these early signs, ask your doctor for a referral for a diagnostic evaluation.

Talk to your child's doctor or teacher about any of these early signs or contact your local early intervention program. Share this Checklist with them.



BABY NAVIGATOR — WHAT EVERY PARENT NEEDS TO KNOW
Go to BabyNavigator.com to find out what every parent needs to know about early learning.
What you do and say can make all the difference.