Using the Battelle 3 Developmental Inventory in the Assessment of Young Children With Autism Spectrum Disorder

Sam Goldstein, PhD

Clinical Director, Neurology, Learning and Behavior Center

Assistant Clinical Professor of Psychiatry, University of Utah

Riverside Insights®

www.samgoldstein.com

info@samgoldstein.com

@drsamgoldstein

@doctorsamgoldstein

@CommonSenseScience

TRUTH. @CommonSenseScience

Relevant Disclosures

Co-author of:

- Comprehensive Executive Functioning Inventory
- Autism Spectrum Rating Scales
- Rating Scale of Impairment
- Cognitive Assessment System –Second Edition
- Handbook of Executive Functioning
- Handbook of Intelligence and Achievement Testing

Compensated Speaker by Riverside

Sam obtained his Ph.D. in School Psychology from the University of Utah and is licensed as a Psychologist and Certified School Psychologist in the State of Utah. He is also board certified as a Pediatric Neuropsychologist and listed in the Council for the National Register of Health Service Providers in Psychology. He is a Fellow of the American Psychological Association and the National Academy of Neuropsychology. Sam is an Adjunct Assistant Professor in the Department of Psychiatry at the University of Utah School of Medicine. He has authored, co-edited, or co-authored over 50 clinical and trade publications, three dozen chapters, nearly three dozen peer-reviewed scientific articles, and eight psychological and neuropsychological tests. He is in development for a behavioral assessment tool to evaluate DMDD, a new interactive test for ASD, and is editing a clinical volume about DMDD. Sam is the Editor in Chief of the *Journal of Attention Disorders.* Since 1980, he has served as the Clinical Director of the Neurology, Learning, and Behavior Center in Salt Lake City, Utah.

Presentation Objectives

1. This session will help participants develop an appreciation and insight to formulate an assessment battery to determine IDEIA and ADA eligibility for young children with ASD as well as complete a comprehensive assessment of a young child with suspected ASD.

2. Participants will acquire knowledge needed to understand the role the Battelle Developmental Inventory 3 can serve in a school-based or community assessment of young children with ASD.

3. This session will help participants gather data, make diagnoses, determine eligibility and formulate educational goals for young children presenting with ASD and accompanying developmental delays.

NASP Domains

- *Domain 1: Data-Based Decision Making*
- *Domain 4: Mental and Behavior Health Services and Interventions*
- *Domain 9: Research and Evidence-Based Practice*

Broadening the Spectrum

- Eleven meta-analyses published between 1966 and 2021.
- 27,723 total subjects from around the world.
- Five psychosocial dimensions: emotion recognition, theory of mind, cognitive flexibility, planning and inhibition.
- For all 5 dimensions group differences between normal and those with ASD have declined since 2000.
- This is generally attributed to differences in diagnostic criteria, assessment practices and community awareness.

The Autism Spectrum by Cognition & Language

Levels of Cognitive Functioning

(~30-35%) *(~65-70%)*

Cognitive Impairment

Language Impairment

Seizures & Medical Co-Occurring Conditions

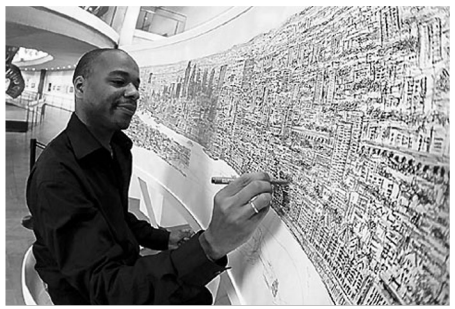
Severe/Profound Autism

Intact Cognition & Language

Asperger Syndrome

Psychiatric Co-Occurring Conditions

Neurodivergent



Current Statistics on Autism (CDC)

IN THE GENERAL POPULATION:

- 1 in 44 8-year-old children are identified with ASD
- Male-Female Ratio:
  - 4 times higher in boys
- Median Age of Diagnosis: 4-5 years
  - Much later for disadvantaged populations
- When ASD can be reliably diagnosed:
  - 18-24 months when diagnosed by experienced clinicians
- Co-Occurring Intellectual Disability:
  - 35% with ID

GENETIC LIABILITY:

- ASD in Subsequent Biological Siblings: 1 in 5 (~20% risk)
- Broader Autism Phenotype ("shadow symptom*s"): 1 in 5 Siblings*
- Non-ASD developmental delays: 1 in 10 Siblings

Autism in Females

- Females often misdiagnosed or missed to diagnosis
- Females may present with stronger social skills (Kreiser & White, 2014):
  - Intact symbolic and imaginary play
  - Larger emotional vocabulary
  - Greater awareness and desire for social interaction
  - Ability to mimic others in social situations
  - May develop one or two close friends
- Restricted interests tend to be related to people/animals rather than inanimate objects (Lai & Baron-Cohen, 2015)
- Research points to a “protective effect” in females (Satterstrom et al., 2020)
- “Camouflaging Effect”: Females are more likely to use coping strategies to hide ASD behaviors – likely due to social pressures (Hull et al., 2017)
- Higher rates of internalizing disorders (anxiety, depression, eating disorders)

Females on the Autism Spectrum

Behaviour

Less prone to act out physically or aggressively

Intense focus on a particular subject, often involving animals or classic literature

Appears anxious when there are changes in routine

Observes human behaviour, learning to mask difficulties

Practices rituals that appear to have no function

May play with dolls or toys well beyond the typical age for these items

Tendency toward perfectionism in certain aspects of her life

High risk of having episodes of eating disorders and self medication

Communication

More aware of the need for social interaction

May have an exceptional vocabulary

Tends to mimic rather than providing natural responses

May converse in predictable, "scripted" ways

Seems to struggle with non-verbal aspects of communication, such as body language and tone of voice

May use odd inflection

Appears to have difficulty dealing with unexpected verbal responses

Social

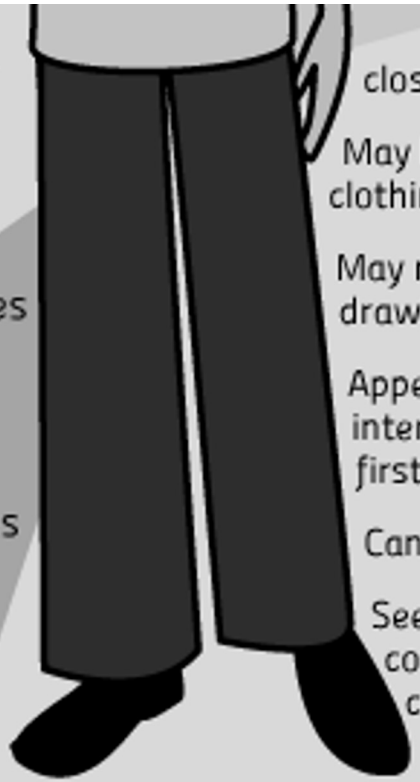
More able to follow social actions through observation

Stimming behaviors, such as hand flapping, rocking, or spinning can appear much milder. They can also be internalised/thoughts instead of external behaviours

May apologise and appease when they make a social error

Often more socially aware and driven

Males may often present with many of these traits, just like females can present with the more male type traits. It is called a female presentation because it is more commonly seen amongst females on the autism spectrum



Usually has only one or two close friends at school

May have difficulty fitting in due to clothing and hairstyle choices

May make greater efforts to avoid drawing attention to themselves

Appears excessively shy or avoids interacting with others or making the first move socially

Can be quite controlling in play

Seems uncomfortable during conversation. Can struggle with eye contact

Often "mothered" by others in primary school but bullied in high school

May play appropriately with toys and engage in pretend play or may focus on organizing objects or toys

Often shows empathy and compassion but may be confused by non-verbal social signals

Usually holds it together well while out and explodes at home

the little black duck
autism communication services

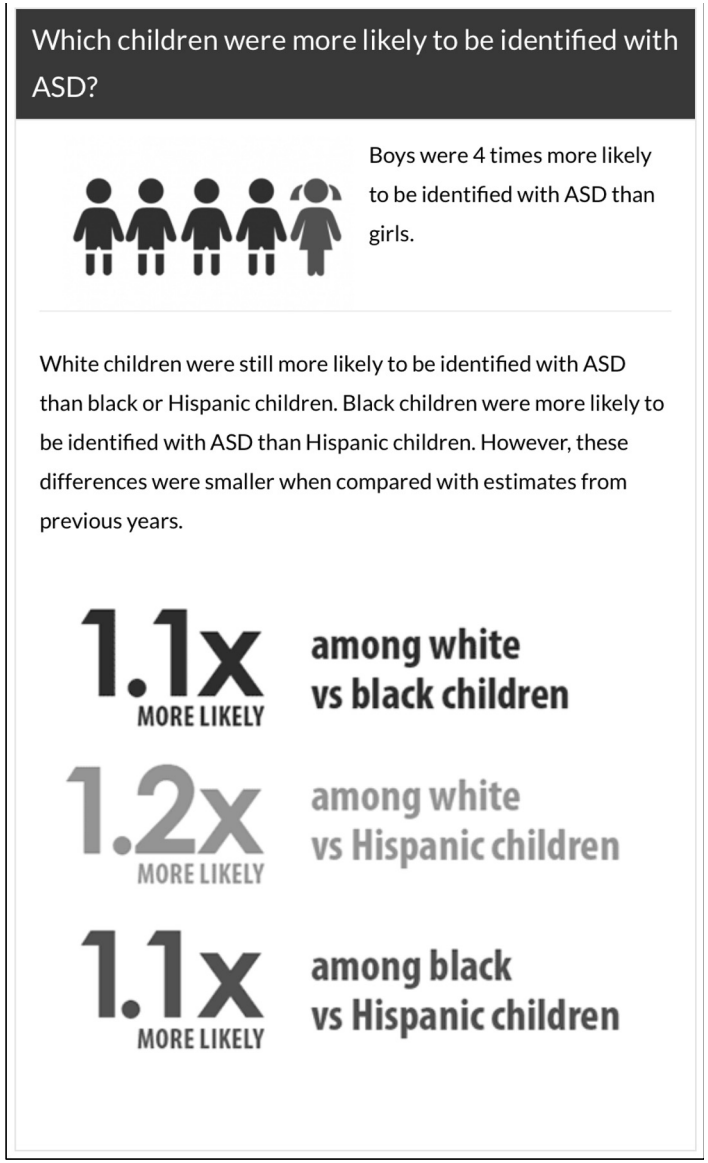
www.thelittleblackduck.com.au

Racial & Ethnic Disparities

www.cdc.gov/ncbddd/autism/addm

- Prevalence rates are FINALLY identical for non-Hispanic white, non-Hispanic black, and Asian/Pacific Islander children but continue to be LOWER for Hispanic children
- 47% of Black children and 36% of Hispanic children are more likely to have Intellectual Disability with ASD compared to 27% of White children
- Black children with ASD are are less likely to have a first evaluation by age 3 than White children

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION



Development of Play Skills in Autism

- Sensory-Exploratory Play – Pro-longed in ASD
  - Mouthing/dropping/manipulating objects
- Cause-and-Effect Play – Perseverative in ASD
  - Push-button & musical toys
- Functional Play – Impaired (e.g., lining up; visual peering; fixation on parts)
  - Using a toy for intended purpose (e.g., “driving” a car; “talking” on a phone; building with blocks; feeding a baby)
- Symbolic & Imaginary Play – delayed/prolongued (females) or absent in ASD
  - Using a toy for a novel purpose (e.g., using a block as a phone)
  - Using miniature figurines as agents (e.g., “mommy” feeding the baby)

Use of Biomarkers to Detect Autism

SCIENTIFIC REPORTS

Article | OPEN | Published: 01 May 2018

EEG Analytics for Early Detection of Autism Spectrum Disorder: A data-driven approach

William J. Bosl ✉, Heler

Scientific Reports **8,** Arti

Science News *from research organizations*

Predicting autism: Study links infant brain connections to diagnoses at age two

Date: June 7, 2017

Source: University of North Carolina Health Care System

Summary: In previous studies, researchers linked infant brain anatomy differences to autism diagnoses at age two. Now they show differences in functional connections between brain regions at 6 months to predict autism at age two.

GEN News Highlights

February 20, 2018

Blood/Urine Biomarker Tests Developed for Autism Spectrum Disorders

LETTER

doi:10.1038/nature12715

Attention to eyes is present but in decline in 2–6-month-old infants later diagnosed with autism

Warren Jones[1,2,3] & Ami Klin[1,2,3]

Research | Open Access

Identification of an age-dependent biomarker signature in children and adolescents with autism spectrum disorders

Jordan M Ramsey, Paul C Guest, Jantine AC Broek, Jeffrey C Glennon, Nanda Rommelse, Barbara Franke, Hassan Rahmoune, Jan K Buitelaar and Sabine Bahn ✉

Molecular Autism 2013 **4**:27

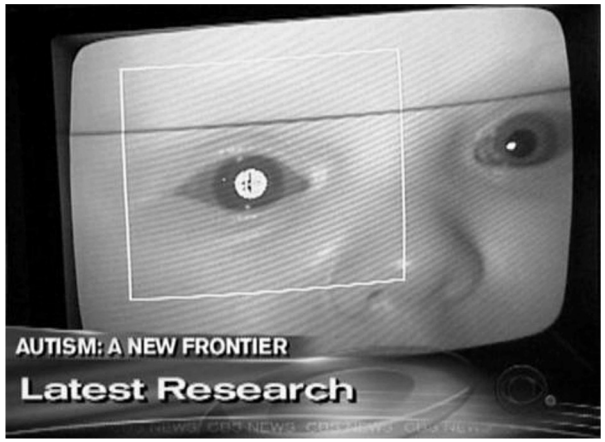
https://doi.org/10.1186/2040-2392-4-27

Received: 1 May 2013 | **Accepted:** 11 July 2013 | **Published:** 6 August 2013

ASD Biologic/Genetic Identification

- Early detection for ASD is crucial for patients and their quality of life
- Data help researchers seek out commonalities, causes, and interventions.
- Behavioral tests limited to only diagnosing ASD will eventually be pushed out of the market in favor of tools (questionnaires and face to face measures) generating a profile of strengths and weaknesses to target in treatment.
- Profiles of strengths and vulnerabilities inform intervention programs, and areas of strength are used to build upon areas of weakness
- Measures that can identify these profiles can also track progress

Infant Eye Tracking Studies



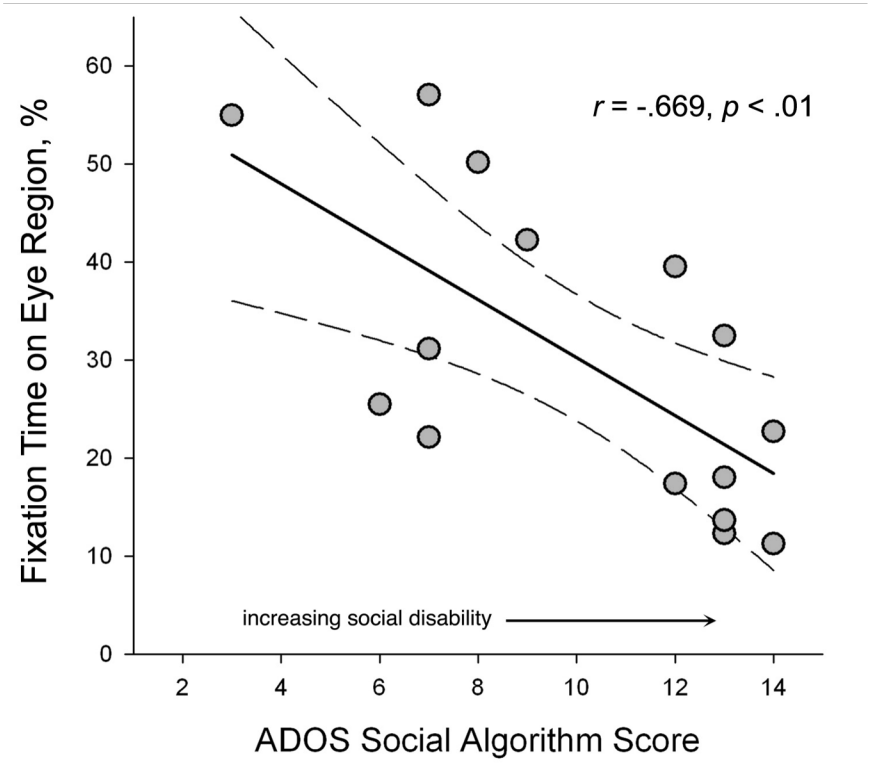
Patterns of Eye Gaze at monthly intervals

Birth through 36 months – data collected over 11 visits (2, 3, 4, 5, 6, 9, 12, 15, 18, 24, 36m)

Creating Growth Charts of Social Visual Engagement

Predictors of Outcome

Jones, Carr, & Klin (2008; Arch Gen Psychiatry)



Less fixation time on eyes predicts more severe social disability.

Key Assumption:

Children with ASD master a series of early social and related developmental tasks in a reliable sequence, corresponding to that seen in typically developing children.

But they are delayed, often requiring direct instruction to acquire a range of skill and behaviors others develop through experience alone.

Key Assumptions

Sensory motor differences precede the unfolding of cognitive and adaptive deficits, as well as behavioral features of ASD across a six-to-twenty-four-month old interval.

The less severely affected group with ASD demonstrate later symptom onset in the second year of life with initial differences in the social communication domain.

What are some measurable abnormalities of development that might demonstrate themselves in characteristic patterns of social and communicative behavior?

1. The ability to attribute mental states to one's self and others.

2. The ability to display an emotional reaction appropriate to another person's mental state (joint attention of emotion).

3. The ability to plan and attend to relevant details in the environment.

What are some measurable abnormalities of development that might demonstrate themselves in characteristic patterns of social and communicative behavior ?

4. The ability to understand the communicative content of gaze.

5. The ability to work cooperatively with others (share joint attention of behavior).

6. The ability to understand, comprehend, analyze, synthesize, evaluate and differentiate in particular, social information in his environment.

Diagnostic Evaluations for Autism are Comprehensive!

- Screeners for Risk and Need for Evaluation
- Developmental History
- Assessment of Developmental or Cognitive Skills
- Speech, Language, & Communication Assessment
- Adaptive Behavior Assessment
- Assessment of Autism Symptomatology
- Assessment of Executive Functioning
- Assessment of Emotional/Behavioral Regulation Skills

Assessing Autism Symptomatology

Screeners

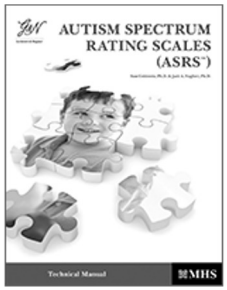
- Identifying risk factors for ASD
- Detecting red flags that require further evaluation

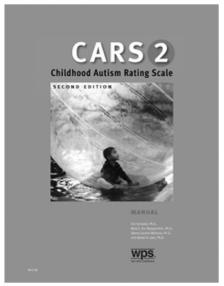
Ratings

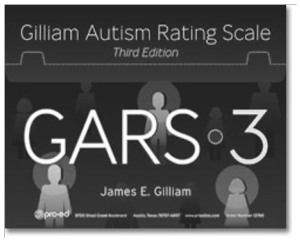
- Parent report / School Report
- Rating Scales/Questionnaires

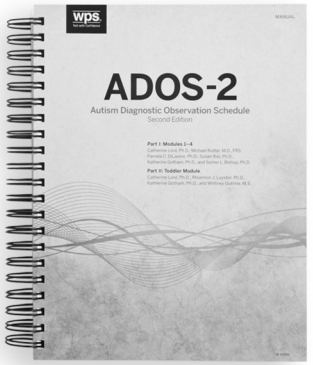
Direct Assessment

- Direct observation of child with/without structure
- Probe language, social, play skills
- Observe atypical/stereotypical behaviors









Autism Diagnostic Observation Schedule, Second Edition (ADOS-2)

5 Modules based on age and language level

- Toddler Module: Between 12 and 30 months with no phrase speech
- Module 1: 31 months + with no phrase speech
- Module 2: 31 months + with phrase speech
- Module 3: Verbally fluent children & young adolescents
- Module 4: Verbally fluent older adolescents & adults

Items Coded on 4-point severity scale

- 0 = symptom not present
- 3 = symptom severe/atypical

Diagnostic Algorithm for Modules 1-4:

- Autism
- Autism Spectrum
- Non Autism Spectrum

ADOS-2
www.wpspublish.com
Lord et al., 2012

Clinician Best Estimate (CBE)

- Most grants currently follow best-practices of using a CBE by 1 or 2 experienced clinicians that incorporates data from a variety of assessment sources (e.g., developmental history, ADOS-2, ADI-R, ASRS, cognitive findings, etc.)
- CBE typically trumps any single measure's algorithm/cut-offs, although some studies may still require minimum cut-offs
- No single measure diagnoses autism. Clinicians diagnose autism.

Battelle 3

Developmental Inventory
3rd Edition

DEVELOPMENT AT-A-GLANCE

BIRTH TO 7 YEARS 11 MONTHS

Columbus

Type	Private Nonprofit Charitable Trust
Industry	National Security, Healthcare, Environment
Founded	Columbus, Ohio (1929)
Headquarters	Columbus, Ohio, USA
Key people	Lewis Von Thaer, President and CEO
Services	Research & Development, Engineering Services
Revenue	US$6.2 billion[1]
Number of employees	3,200 (+29,500 from national labs)
Website	www.battelle.org

Developed in 1973 at the Battelle Memorial Institute Columbus Laboratories by Jean Newborg.

Project was initiated by the U.S. Department of Education to provide a uniform measure of developmental progress and to evaluate effectiveness of federally funded Early Childhood Education Programs

Currently, practitioners across all 50 states use the BDI for special services eligibility.

Sixteen states use the BDI as a preferred state assessment and anchor tool

Battelle Developmental Inventory 3

The new Battelle Developmental Inventory (BDI 3) is a comprehensive assessment that measures 6 areas of developmental milestones including:

- Social Emotional (Personal-Social)
- Communication
- Adaptive
- Motor
- Cognitive
- Battelle Early Academic Survey

Battelle 3 is the only assessment on the market that measures these domains from birth to 7 years 11 months. It is the most comprehensive assessment on the market for early childhood and is widely used by early childhood evaluators.

Standardization and Norms of BDI-3

2500 children completed the Adaptive, Cognitive, Communication, Motor and Social-Emotional domains from 20 age groups with 100 children in each group

Special Group Studies were performed for BDI 3 Standardization

- Autism
- Cognitive Delay
- Motor Delay
- Premature Birth
- Speech and Language Delay
- Broad Developmental Delay

1000 children completed the Spanish Developmental Battery assessment in 20 age groups.

1000 children completed the Battelle Early Academic Survey assessment in 9 age groups.

BDI-3 Domains and Subdomains

Social-Emotional Domain
- Adult Interaction
- Peer Interaction
- Self- Concept and Social Role

Adaptive Domain
- Self Care
- Personal Responsibility

Motor Domain
- Gross
- Fine
- Perceptual

Communication Domain
- Receptive
- Expressive

Cognitive Domain
- Attention and Memory
- Reasoning and Academic Skills
- Perception and Concepts

Battelle Early Academic Survey
- Literacy
- Mathematics

Communication Domain

- Receptive
- Expressive
- ***Articulation (items included to assess ability to produce specific sounds)

Cognitive Domain

- Attention and Memory
- Reasoning and Academic Skills
- Perception and Concepts

Motor Domain

- Gross
- Fine
- Perceptual

Social Emotional Domain

- Adult Interaction
- Peer Interaction
- Self Concept and Social Role

Adaptive Domain

- Self Care
- Personal Responsibility

Testing Time:

5-10 minutes per subtest

Estimate 1 hour for full battery

The BDI-3 Developmental Screening Test

- Allows you to quickly screen and evaluate early developmental milestones to identify children at risk for developmental delays or disabilities.

- Requires no more than 30 minutes for a full administration.

- Consists of a subset of test items from each of the 5 BDI-3 domains.

- Requires only 1 Easel book.

- Quickly screen for school readiness.

BDI-3 Key Features

Comprehensive measurement of all developmental areas

Conceptualization of *developmental milestones*

Age range of birth through 7 years, 11 months

Complete assessment and screening test

Flexible administration options

Multiple point scoring

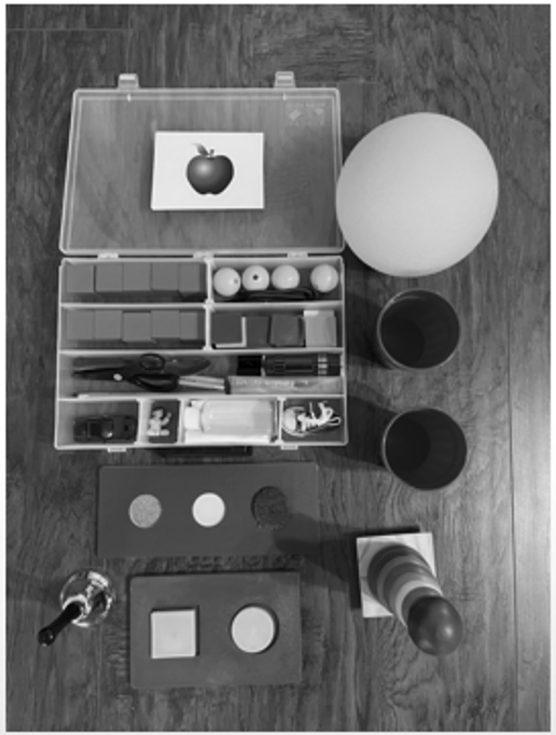
Easy to score

Norm, curriculum, and criterion reference base

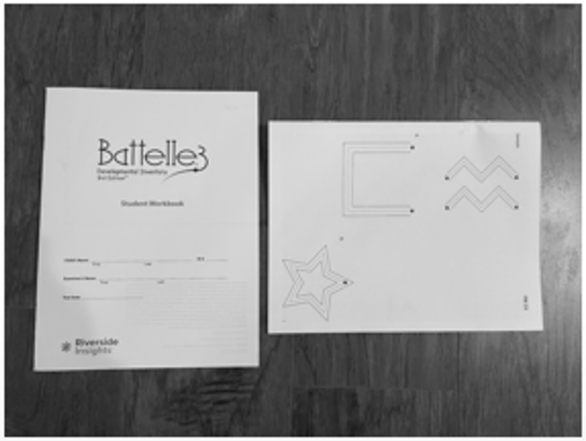
Broad Applications and Purposes of the BDI-3

Identify the developmental strengths and opportunities for learning of typically developing infants and children.	Identify the developmental strengths and opportunities for learning of children with disabilities in infant intervention, preschool, kindergarten and primary education programs.	Assessing children as part of a comprehensive evaluation considered to be “at risk” in any developmental area such as ASD.
General screening of preschool and kindergarten children.	Monitoring child progress.	Assessing and developing IEP’s and Treatment Plans.

engaging manipulatives



Student response booklet



Easel Book for each Domain

BEAS Domains and Subdomains

Battelle3
Developmental Inventory
3rd Edition

Literacy

- Print Concepts
- Rhyming
- Phonological Awareness
- Phonics and Word Recognition
- Listening Comprehension
- Fluency

Mathematics

- Numbers Counting and Sets
- Geometry
- Measurement and Data
- Operations and Algebraic Thinking

Testing time:
35-40 minutes

Sample Reports- Battelle Developmental

Domain/Subdomain	RS	SS	PR	AE	CSS	CSS 90% CI	Z-Score	T-Score	NCE
Adaptive	**61**	**83**	**13**	**-**	**496**	**490-501**	**-1.13**	**39**	**26**
Self-Care	52	8	25	38	503	496-510	-0.67	43	36
Personal Responsibility	9	5	5	28	488	479-497	-1.67	33	15
Social Emotional	**54**	**63**	**1**	**-**	**408**	**399-417**	**-2.47**	**25**	**<1**
Adult Interaction	0	1	<1	0	280	255-305	-3.00	20	<1
Peer Interaction	9	2	<1	<24	451	442-460	-2.67	23	<1
Self-Concept and Social Role	45	5	5	33	493	487-499	-1.67	33	15
Communication	**61**	**83**	**13**	**-**	**496**	**490-501**	**-1.13**	**39**	**26**
Receptive Communication	52	8	25	38	503	496-510	-0.67	43	36
Expressive Communication	9	5	5	28	488	479-497	-1.67	33	15
Motor	**54**	**63**	**1**	**-**	**408**	**399-417**	**-2.47**	**25**	**<1**
Gross Motor	0	1	<1	0	280	255-305	-3.00	20	<1
Fine Motor	9	2	<1	<24	451	442-460	-2.67	23	<1
Perceptual Motor	61	83	13	-	496	490-501	-1.13	39	26
Cognitive	**52**	**8**	**25**	**38**	**503**	**496-510**	**-0.67**	**43**	**36**
Attention and Memory	9	5	5	28	488	479-497	-1.67	33	15
Reasoning and Academic Skills	0	1	<1	0	280	255-305	-3.00	20	<1
Perception and Concepts	9	2	<1	<24	451	442-460	-2.67	23	<1
BDI-2 Total	**52**	**8**	**25**	**38**	**503**	**496-510**	**-0.67**	**43**	**36**

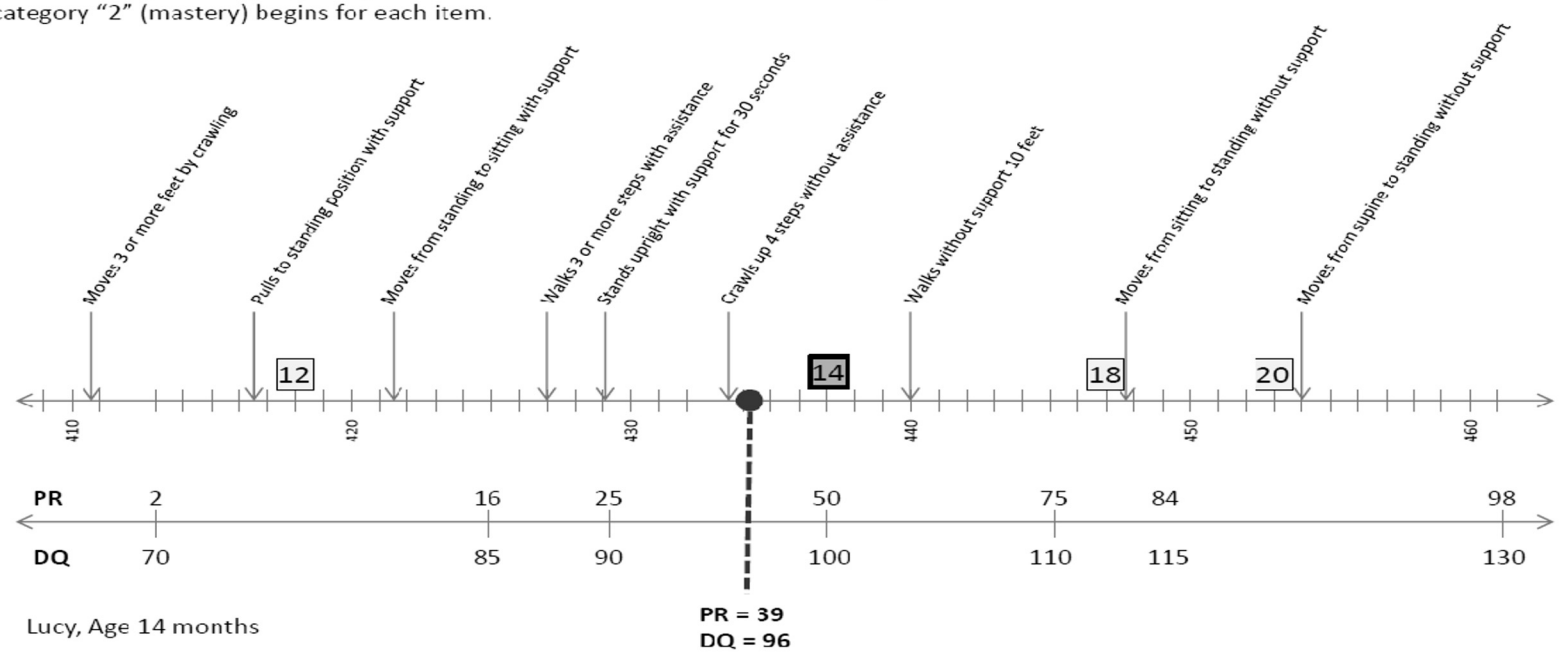
NCE - The Normal Curve Equivalent is another commonly reported type of standard score that has a mean of 50 and a standard deviation of 21.06.

The CSS scale is centered so that a score of 500 on each subdomain represents the developmental level of a typical 36-month-old.

Battelle Developmental Skill Mastery Report

Skill Mastery Report

This type of report can show which skills a child has mastered. It can also overlay normative information for the child's same-age peers and for peers slightly younger and older than the child. Item locations represent the location on the CSS score scale where the category "2" (mastery) begins for each item.



Lucy, Age 14 months

Lucy's Change-Sensitive (CSS) Score . This describes Lucy's location on the developmental continuum of Gross Motor milestones. Skills to the left of Lucy's location will be relatively easy for her; skills to the right of her location will be difficult.

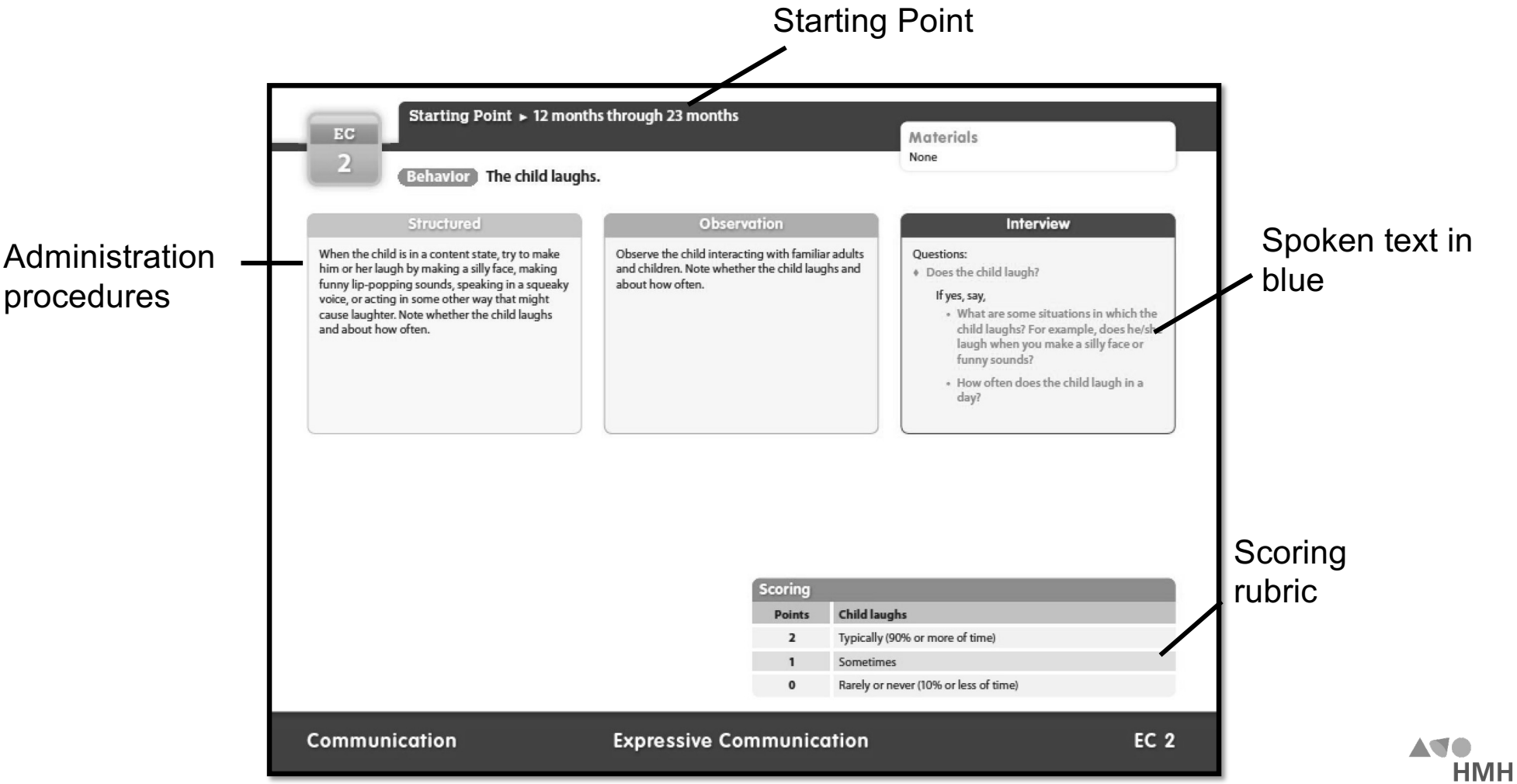
Median CSS for Lucy's same-age peers. The pink box describes the median (*middle*) location on the CSS scale for all of the 14 month old children in the norming sample.

Median CSS for other ages. The gray boxes describe the location on the CSS scale of *typical* children at different ages (shown in months).

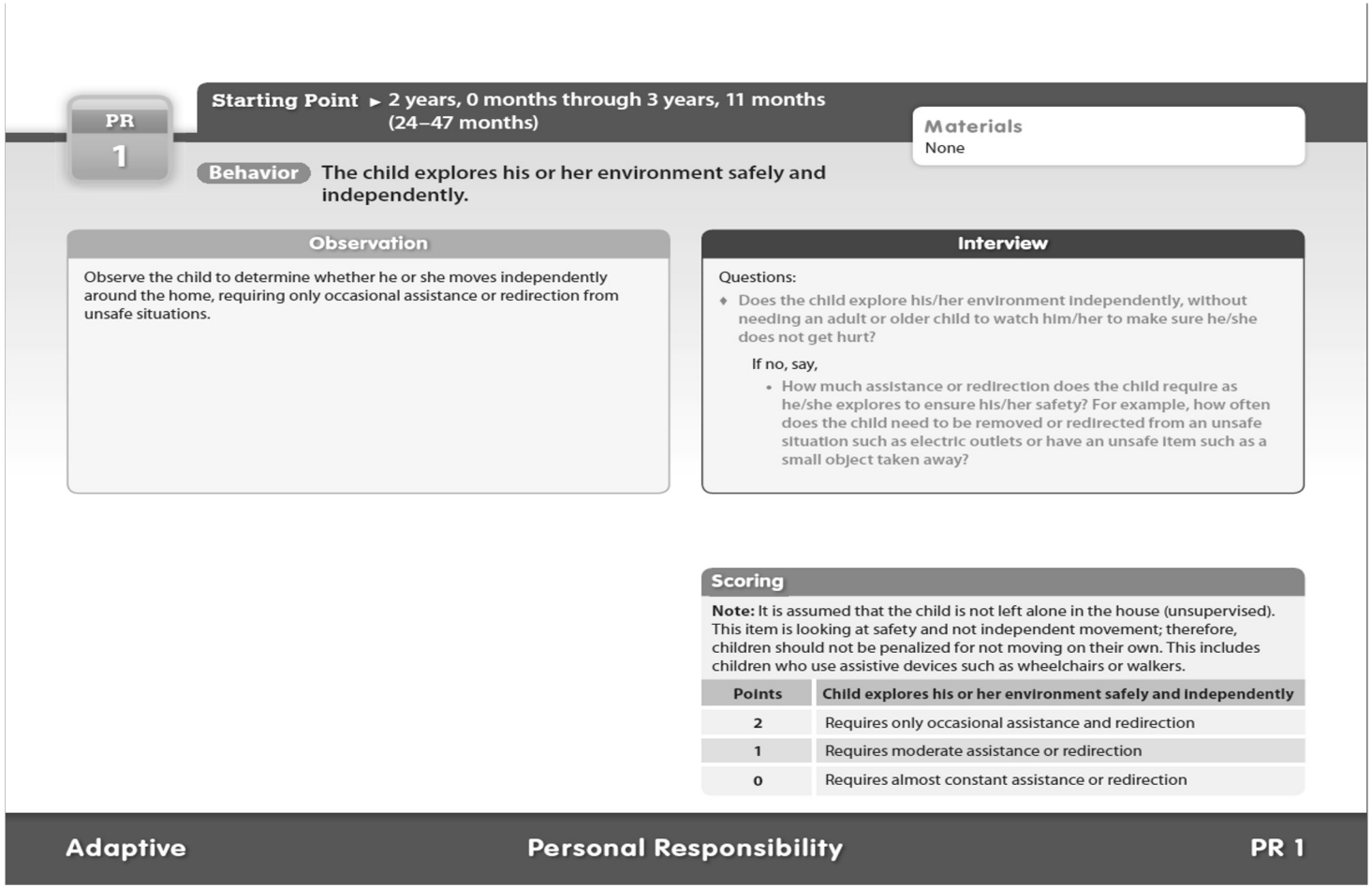
Battelle Early Academic Survey Sample Reports- Table of Scores- Literacy

					<25%tile	25th-49t%tile	>=50%tile
Domain/Subdomain/Area	**Raw Score**	**Scaled Score**	**Standard Score**	**Percentile Rank**	**Support**	**Monitor**	**On Track**
Literacy			100	75	x		
Print Concepts	8	8		25		x	
Phonological Awareness		5		5			x
Syllables	6				x		
Onset Rime	7					x	
Phoneme Identification	8						x
Phoneme Blending and Segmenting	4				x		
Phoneme Manipulation	3					x	
Phonics And Word Recognition		5		5			x
Letter Identification	8				x		
Letter Sound Correspondence	7					x	
Early Decoding	5						x
Sight Words	2				x		
Nonsense Words	3					x	
Long Vowel Patterns	8						x
Inflectional Endings	7				x		
Listening Comprehension	8	8		25		x	
Fluency	7	5		5			x

Layout of Item Books



Sample New Item- Adaptive Domain



PR 1

Starting Point ▸ 2 years, 0 months through 3 years, 11 months (24–47 months)

Materials
None

Behavior The child explores his or her environment safely and independently.

Observation

Observe the child to determine whether he or she moves independently around the home, requiring only occasional assistance or redirection from unsafe situations.

Interview

Questions:

- Does the child explore his/her environment independently, without needing an adult or older child to watch him/her to make sure he/she does not get hurt?

If no, say,

- How much assistance or redirection does the child require as he/she explores to ensure his/her safety? For example, how often does the child need to be removed or redirected from an unsafe situation such as electric outlets or have an unsafe item such as a small object taken away?

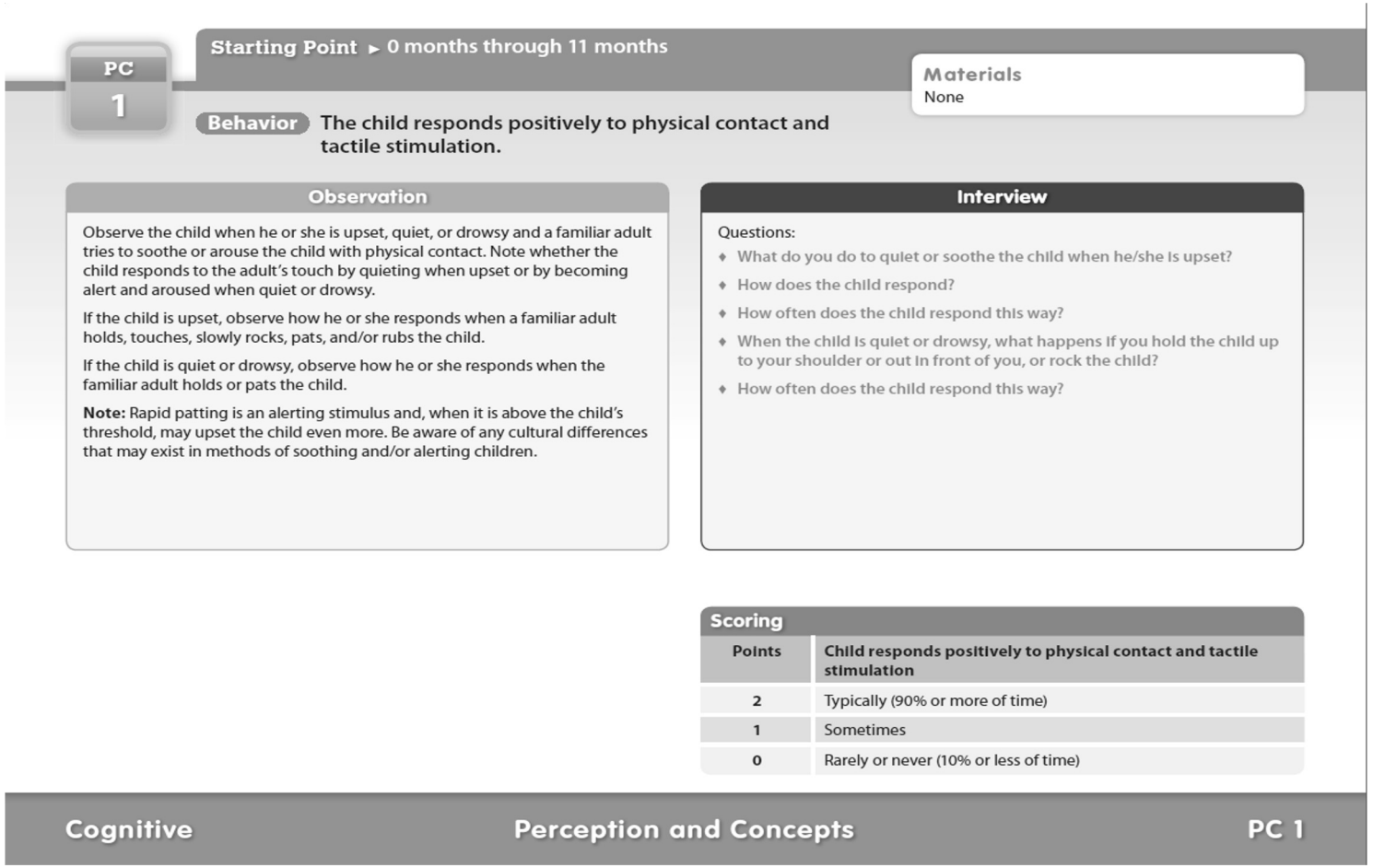
Scoring

Note: It is assumed that the child is not left alone in the house (unsupervised). This item is looking at safety and not independent movement; therefore, children should not be penalized for not moving on their own. This includes children who use assistive devices such as wheelchairs or walkers.

Points	Child explores his or her environment safely and independently
2	Requires only occasional assistance and redirection
1	Requires moderate assistance or redirection
0	Requires almost constant assistance or redirection

Adaptive Personal Responsibility PR 1

Sample New Item- Cognitive Domain



PC 1

Starting Point ▸ 0 months through 11 months

Materials
None

Behavior The child responds positively to physical contact and tactile stimulation.

Observation

Observe the child when he or she is upset, quiet, or drowsy and a familiar adult tries to soothe or arouse the child with physical contact. Note whether the child responds to the adult's touch by quieting when upset or by becoming alert and aroused when quiet or drowsy.

If the child is upset, observe how he or she responds when a familiar adult holds, touches, slowly rocks, pats, and/or rubs the child.

If the child is quiet or drowsy, observe how he or she responds when the familiar adult holds or pats the child.

Note: Rapid patting is an alerting stimulus and, when it is above the child's threshold, may upset the child even more. Be aware of any cultural differences that may exist in methods of soothing and/or alerting children.

Interview

Questions:

- What do you do to quiet or soothe the child when he/she is upset?
- How does the child respond?
- How often does the child respond this way?
- When the child is quiet or drowsy, what happens if you hold the child up to your shoulder or out in front of you, or rock the child?
- How often does the child respond this way?

Scoring

Points	Child responds positively to physical contact and tactile stimulation
2	Typically (90% or more of time)
1	Sometimes
0	Rarely or never (10% or less of time)

Cognitive | Perception and Concepts | PC 1

Sample New Item- Communication Domain

RC 1

Starting Point ▸ 0 months through 11 months

Materials
None

Behavior The child startles to loud sounds.

Structured

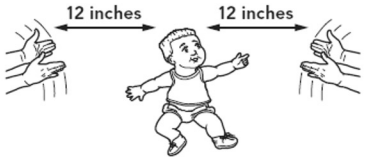
Place the child on his or her back on a firm surface. Stand behind the child's head and out of his or her sight. Move your hands to the child's right side, approximately 12 inches from his or her ear. Clap your hands two times. Then move your hands to the same position on the child's left side and clap two times (see diagram below). Note any changes in the child's behavior that indicate he or she is startled by the clapping. Behaviors indicating the child startles to the clapping might include:

- moving his or her eyes or head
- increasing or decreasing body activity
- changing his or her breathing rate
- changing his or her facial expression
- vocalizing

Observation

Observe the child in situations where there are unexpected sounds. Notice whether the child exhibits a startle response. Behaviors indicating a startle response might include:

- moving his or her eyes or head
- increasing or decreasing body activity
- changing his or her breathing rate
- changing his or her facial expression
- vocalizing



Scoring

Points	Child startles to loud sounds
2	Typically (90% or more of time)
1	Sometimes
0	Rarely or never (10% or less of time)

Communication **Receptive Communication** **RC 1**

Sample New Item- Motor Domain

GM 1

Starting Point ▸ 0 months through 11 months

Materials
Timing device, toy

Behavior The child maintains an upright posture without assistance for at least 2 minutes while being held by an adult.

Structured

Hold the child in an upright position facing you with his or her chest up to your shoulder. Support the child's back and head with your hand and arm. The child should not use your body for support. When the child's head and body are balanced, slowly move your hand and arm away from the child's back and head, but be ready to provide support if necessary. Have another person stand behind you and use his or her hands or voice or a toy from the Manipulatives Kit to attract the child's attention and then slowly move his or her hand to the right, back to the midline, and then to the left (see diagram).

Observe whether the child can maintain an upright body posture with his or her head balanced at the midline. Determine whether the child can maintain this posture while moving his or her head from side to side and whether the child can regain an upright body posture after momentarily losing balance. Note how long the child can maintain this balanced position. Repeat the procedure several times to determine whether the child's response is typical and to see how easily the child maintains an upright posture.

Observation

Observe the child when another person is holding him or her in the upright position described in the Structured administration procedure. Determine whether the child can maintain an upright body posture without assistance from the person holding him or her. Note how long the child can maintain this balanced position.

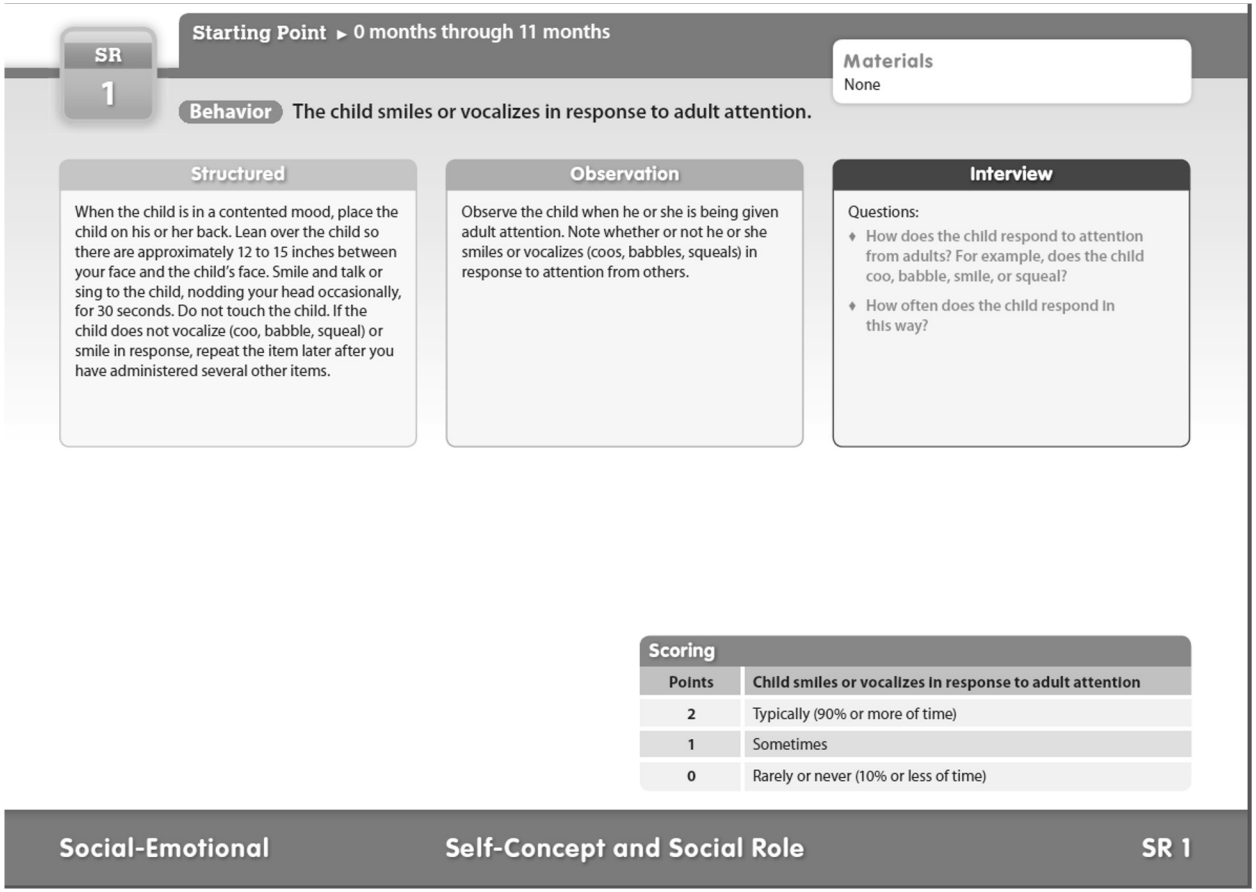
Scoring

Note: Some initial head bobbing is acceptable as long as it does not persist and the child is able to then maintain the position for the appropriate amount of time.

Points	Child maintains an upright posture with his or her head balanced and without assistance for
2	2 minutes
1	Less than 2 minutes
0	Does not maintain an upright position without assistance

Motor | Gross Motor | GM 1

Sample New Item- Social-Emotional Domain



SR 1

Starting Point ▸ 0 months through 11 months

Materials
None

Behavior The child smiles or vocalizes in response to adult attention.

Structured

When the child is in a contented mood, place the child on his or her back. Lean over the child so there are approximately 12 to 15 inches between your face and the child's face. Smile and talk or sing to the child, nodding your head occasionally, for 30 seconds. Do not touch the child. If the child does not vocalize (coo, babble, squeal) or smile in response, repeat the item later after you have administered several other items.

Observation

Observe the child when he or she is being given adult attention. Note whether or not he or she smiles or vocalizes (coos, babbles, squeals) in response to attention from others.

Interview

Questions:

- How does the child respond to attention from adults? For example, does the child coo, babble, smile, or squeal?
- How often does the child respond in this way?

Scoring

Points	Child smiles or vocalizes in response to adult attention
2	Typically (90% or more of time)
1	Sometimes
0	Rarely or never (10% or less of time)

Social-Emotional Self-Concept and Social Role SR 1

Sample New Item- Early Academic Domain

Starting Point ▸ 3 years, 6 months through 6 years, 11 months (42–83 months)

Materials
Olivia and Heather Are Friends book, 1 sheet of paper

Introduction
Say, I am going to ask you some questions about reading a book.

Item 1
Hand the child the book with the front cover facing down and the spine on the child's right.

Say, Show me how to hold this book if you want to start reading it.

Points	Scoring Criteria
1	Holds the book with the front cover facing up and the spine on the left
0	Holds the book incorrectly or does not respond

Item 2
With the book closed and the front cover facing up, say, Point to the name of the book.

Points	Scoring Criteria
1	Points to the title on the front cover
0	Points incorrectly or does not respond

Item 3
Open the book to pages 2 and 3.

Say, Now we are going to think about reading the book. Point to the page that I would read first.

Points	Scoring Criteria
1	Points to page 2
0	Points incorrectly or does not respond

Item 4
Turn to page 4 and point to the page.

Say, Point to the words on this page.

Points	Scoring Criteria
1	Points to the words on page 4
0	Points incorrectly or does not respond

Item 5
Open the book to pages 6 and 7.

Say, Point to where I would start reading on these pages.

Points	Scoring Criteria
1	Points to the first line of text at the bottom of page 6
0	Points incorrectly or does not respond

Item 6
Say, Now point to where I would stop reading on these pages.

Points	Scoring Criteria
1	Points to the word *bucket*, or the space after *bucket*, on page 7
0	Points incorrectly or does not respond

Item 7
Turn to page 3. Place a blank sheet of paper over page 2 so that the child sees only page 3.

Say, Point to just one word on this page.

Points	Scoring Criteria
1	Points to just 1 word on page 3
0	Points incorrectly or does not respond

Academic **Literacy** **Print Concepts 1–7**

Sample New Item- Early Academic Domain

Fluency

Rows 1–3

Say, Now you will look at the same pictures. Tell me the names of the pictures as fast as you can. Start with this picture (point below the picture of the apple in Row 1) and go across (move your finger from the child's left to right below the pictures in Row 1). You may begin.

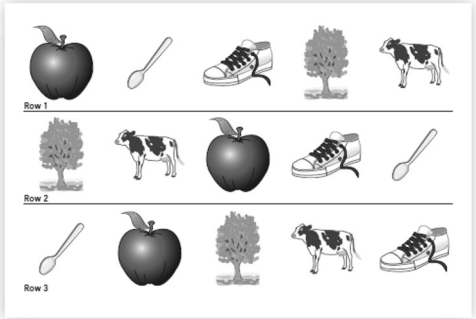
Start timing. Turn the page as soon as the child names the final picture in Row 3.

If the child begins with a picture other than the apple, stop the child and say, Start here (point to the apple in Row 1) and try again.

If the child does not name a picture after a 2-second pause, say, Try the next one.

Allow a maximum of 3 minutes and 30 seconds to complete all items in Rows 1 through 9.

Points	Scoring Criteria
1	Identifies the picture correctly
0	Identifies the picture incorrectly or does not respond



Academic Literacy FLU Rows 1–3

Sample New Item- Early Academic Domain

Numbers, Counting, and Sets

Item 21

Say, Look at the letter pattern. There are two letters missing in the pattern. Point to the 2 blank lines. Which letter comes next in the pattern? Point to the first blank line.

Points	Scoring Criteria
1	Indicates *B*
0	Responds incorrectly or does not respond

Item 22

Say, Which letter comes *after* that in the pattern? Point to the second blank line.

Points	Scoring Criteria
1	Indicates *A*
0	Responds incorrectly or does not respond

Item 23

Say, I am going to start counting by ones. When I stop, you keep on counting. Ninety-five, ninety-six, ninety-seven.

Note: The child may repeat 97. Allow the child to continue counting to 105 even if he or she makes an error. Stop the child at 105.

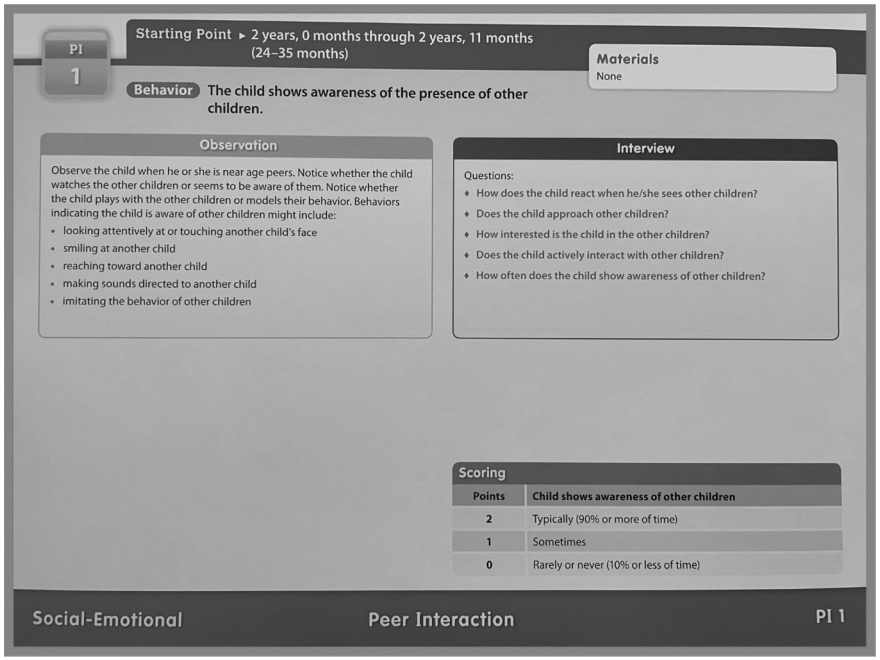
Points	Scoring Criteria
1	Counts correctly from 98 to 105
0	Makes 1 or more error(s) or does not respond

Academic Mathematics NCS 21–23

Using the BDI-3 as Part of an ASD Assessment Focused on ASD Behaviors

30+ items on the BDI-3 complete have been aligned with the DSM-5 criteria for ASD

Example : **Persistent deficits in social communication and social interaction**
→ Cross validate ASRS (i.e., smile appropriately? look at others when interacting with them?



PI 1

Starting Point ▸ 2 years, 0 months through 2 years, 11 months (24–35 months)

Materials: None

Behavior: The child shows awareness of the presence of other children.

Observation

Observe the child when he or she is near age peers. Notice whether the child watches the other children or seems to be aware of them. Notice whether the child plays with the other children or models their behavior. Behaviors indicating the child is aware of other children might include:

- looking attentively at or touching another child's face
- smiling at another child
- reaching toward another child
- making sounds directed to another child
- imitating the behavior of other children

Interview

Questions:

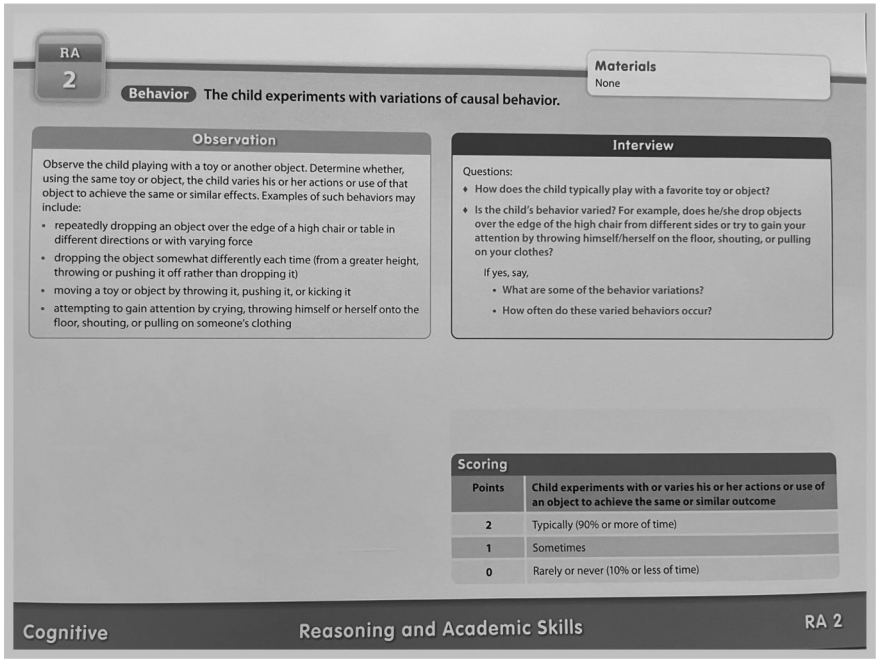
- How does the child react when he/she sees other children?
- Does the child approach other children?
- How interested is the child in the other children?
- Does the child actively interact with other children?
- How often does the child show awareness of other children?

Scoring

Points	Child shows awareness of other children
2	Typically (90% or more of time)
1	Sometimes
0	Rarely or never (10% or less of time)

Social-Emotional — Peer Interaction — PI 1

Example : **Restricted, Repetitive Patterns of Behavior, interests and/or activities**
→ Cross validate ASRS (i.e., play with toys appropriately?)



RA 2

Materials: None

Behavior: The child experiments with variations of causal behavior.

Observation

Observe the child playing with a toy or another object. Determine whether, using the same toy or object, the child varies his or her actions or use of that object to achieve the same or similar effects. Examples of such behaviors may include:

- repeatedly dropping an object over the edge of a high chair or table in different directions or with varying force
- dropping the object somewhat differently each time (from a greater height, throwing or pushing it off rather than dropping it)
- moving a toy or object by throwing it, pushing it, or kicking it
- attempting to gain attention by crying, throwing himself or herself onto the floor, shouting, or pulling on someone's clothing

Interview

Questions:

- How does the child typically play with a favorite toy or object?
- Is the child's behavior varied? For example, does he/she drop objects over the edge of the high chair from different sides or try to gain your attention by throwing himself/herself on the floor, shouting, or pulling on your clothes?

If yes, say,

- What are some of the behavior variations?
- How often do these varied behaviors occur?

Scoring

Points	Child experiments with or varies his or her actions or use of an object to achieve the same or similar outcome
2	Typically (90% or more of time)
1	Sometimes
0	Rarely or never (10% or less of time)

Cognitive — Reasoning and Academic Skills — RA 2

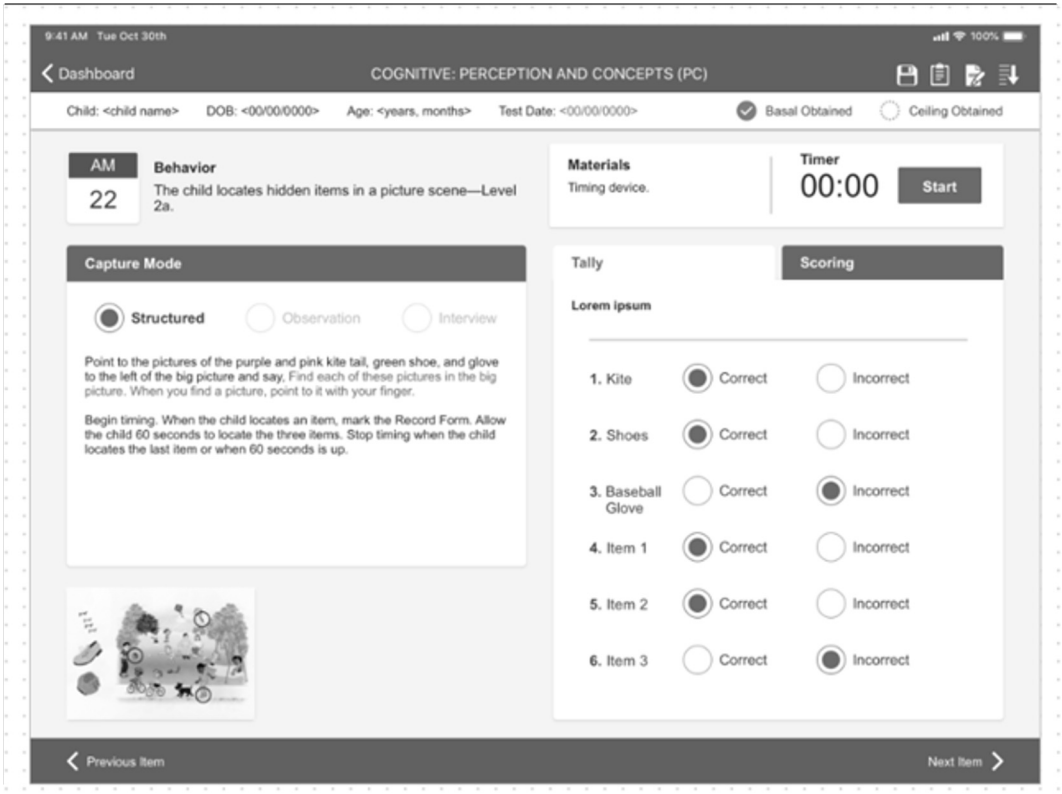
BDI-3 Scoring & Reporting

- BDI-3 scoring can be completed through the web-based **Riverside Score** system - a secure, web-based environment where examiners can easily enter raw scores, assessment data, and test session observations.

- BDI-3 Developmental Complete Sample Report

Mobile data solution (BDI-3 MDS)

- Administer the BDI-3 on-the-go using a compatible Windows Device or tablet.
- Use it with any combination of the complete test, screening test or BEAS
- Timer capability
- In-the-moment scoring
- Combines examiner test easel instructions and examiner test record forms
- Reduce human error with basal and ceiling indicators
- Can also use offline & synch back to Riverside Score once internet connection is available



Conclusions

- Our focus in ASD definition, diagnosis and treatment is shifting to a disorder of primarily social functioning.
- ASD is a lifespan condition.
- The identification of ASD is shifting to a technology driven assessment of critical biological variables (e.g. eye gaze)
- Children with ASD demonstrate measurable abnormalities in development that can be reliably and validly measured to design individualized treatment.
- The Battelle 3 offers a viable means to assess key developmental areas as part of a comprehensive evaluation for young children with ASD.

www.samgoldstein.com
info@samgoldstein.com
@drsamgoldstein
@doctorsamgoldstein
@CommonSenseScience
TRUTH. @CommonSenseScience

TEDx

Sam Goldstein, Ph.D.
sam@samgoldstein.com

The Power Of Resilience

https://www.youtube.com/watch?v=isfw8JJ-eWM&feature=youtube_gdata

Riverside Insights®

Questions?