Theory of Mind:
Going to the Heart of Autism and Social Communication Disorders
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Disclosure: Carol Westby provides continuing education programs on Theory of Mind


Criteria for Language Impairment

A. Persistent difficulties in the acquisition and use of language across modalities (i.e., spoken, written, sign language, or other) due to deficits in comprehension or production that include the following:
   1. Reduced vocabulary (word knowledge and use)
   2. Limited sentence structure (ability to put words and word endings together to form sentences based on the rules of grammar and morphology)
   3. Impairments in discourse (ability to use vocabulary and connect sentences to explain or describe a topic or series of events or have a conversation.

B. Language abilities are substantially and quantifiably below those expected for age, resulting in functional limitations in effective communication, social participation, academic achievement, or occupational performance, individually or in any combination.

C. Onset of systems is in the early developmental period.

D. The difficulties are not attributable to hearing or other sensory impairment, motor dysfunction, or other medical or neurological condition and are not better explained by intellectual disability (intellectual development disorder) or global developmental delay.

Criteria for Social (Pragmatic) Communication Disorder

A. Persistent difficulties in pragmatics or the social uses of verbal and nonverbal communication as manifested by all of the following:
   1. Deficits in communication for social purposes, such as greeting and sharing information, in a manner that is appropriate for the social context.
   2. Impairment of the ability to change communication to match context or the needs of the listener, such as speaking differently in a classroom than on a playground, talking differently to a child than to an adult, and avoiding the use of overly formal language.
   3. Difficulties following rules for conservation and storytelling, such as taking turns in conversation, rephrasing when misunderstood, and know how to use verbal and nonverbal signals to regulate interaction.
   4. Difficulties understanding what is not explicitly stated (e.g., making inferences) and nonliteral or ambiguous meanings of language (e.g., idioms, humor, metaphors, multiple meanings that depend on the context for interpretation).
B. The deficits result in functional limitations in effective communication, social participation, social relationships, academic achievement, or occupational performance, individually or in combination.

C. The onset of symptoms must be present in the early developmental period (but deficits may not become fully manifest until social communication demands exceed limited capacities).

D. The symptoms are not attributable to another medical or neurological condition or to low abilities in the domains of word structure and grammar, and are not better explained by autism spectrum disorder, intellectual disability (intellectual development disorder) and global developmental delay, or another mental disorder.

**DSM-5 criteria for Autism Spectrum Disorders**

A. Persistent deficits in social communication and social interaction across contexts, not accounted for by general developmental delays, and manifest by all 3 of the following:

1. Deficits in social-emotional reciprocity; ranging, for example, from abnormal social approach and failure of normal back and forth conversation; to reduced sharing of interests, emotions, and affect; to failure to initiate or respond to social interaction.

2. Deficits in nonverbal communicative behaviors used for social interaction; ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body-language or deficits in understanding and use of gestures; to total lack of facial expression and nonverbal communication.

3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, form difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

Specify current severity. Severity is based on social communication impairments and restricted, repetitive patterns of behaviors.

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).

2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day).

3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest).

4. Hyper- or hyporeactivity to sensory input or unusual interests in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).
Specify current severity. Severity is based on social communication impairments and restricted, repetitive patterns of behaviors.

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

**Note:** Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger’s disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Specify if:

- With or without accompanying intellectual impairment
- With or without accompanying language impairment
- Associated with a known medical or genetic condition or environmental factor
  (Coding note: Use additional code to identify the associated medical or genetic condition.)
- Associated with another neurodevelopmental, mental, or behavioral disorder
  (Coding note: Use additional code[s] to identify the associated neurodevelopmental, mental, or behavioral disorder[s].)
- With catatonia (refer to the criteria for catatonia associated with another mental disorder, pp. 119-120, for definition) (Coding note: Use additional code 293.89 [F06.1] catatonia associated with autism spectrum disorder to indicate the presence of the comorbid catatonia.)

Severity levels for autism spectrum disorder
<table>
<thead>
<tr>
<th>Severity level</th>
<th>Social communication</th>
<th>Restricted, repetitive behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 3 &quot;Requiring very substantial support&quot;</td>
<td>Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.</td>
<td>Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.</td>
</tr>
<tr>
<td>Level 2 &quot;Requiring substantial support&quot;</td>
<td>Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and how has markedly odd nonverbal communication.</td>
<td>Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.</td>
</tr>
<tr>
<td>Level 1 &quot;Requiring support&quot;</td>
<td>Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful response to social overtures of others. May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.</td>
<td>Inflexibility of behavior causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.</td>
</tr>
</tbody>
</table>
**Articles with Ideas for Assessing ToM**

These research articles include the tasks that were used.


You can take the adult version of the "Mind in the Eyes Test" at these websites:
  
  glennrowe.net/BaronCohen/Faces/EyesTest.aspx and
  
  www.questionwritertracker.com/quiz/61/Z4MK3TKB.htm
  
  http://www.romankrznaric.com/outsrospection/2010/01/30/359

Child's version of "Mind in the Eyes Test" and faux pas test available at:
http://www.autismresearchcentre.com/arc_tests

Download “Yoni” slides used by Samay-Tsoory for assessment of cognitive and affective ToM
http://sans.haifa.ac.il/downloads.html

Videos for the "Reading the Mind in Videos can be downloaded from this site:
http://www.autismresearchcentre.com/arc_tests

**Standardized Tests**


### Development of Theory of Mind

**Carol Westby**

<table>
<thead>
<tr>
<th>Age</th>
<th>Cognitive Theory of Mind</th>
<th>Affective Theory of Mind</th>
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<tbody>
<tr>
<td>Birth-6 months</td>
<td>--Responsive joint attention</td>
<td>Primary intersubjectivity</td>
</tr>
<tr>
<td></td>
<td>--Follow line of regard</td>
<td>--Respond to emotional reactions of others</td>
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<tr>
<td></td>
<td>--Behavioral regulation; Initiate behavior request</td>
<td>--Imitates expressions</td>
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<tr>
<td></td>
<td>--Initiate joint attention on objects</td>
<td></td>
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<tr>
<td>6-8 months</td>
<td></td>
<td><strong>Secondary Intersubjectivity</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>--Display joy, sadness, disgust, anger</td>
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<tr>
<td>8-12 months</td>
<td>--Understand physical relation between a person’s line of sight and their behavior; one sees what one looks at</td>
<td>--Use emotional expression of caregivers as social reference for approach-avoidance</td>
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<tr>
<td></td>
<td></td>
<td>--Display emotions of happy, mad, sad, surprised, disgusted, afraid</td>
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<tr>
<td>13-17 months</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>--Sense of self</td>
<td>--Seek to change affect of another by direct contact</td>
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<tr>
<td></td>
<td>--Engage in pretend</td>
<td>--coordination/coregulation of interactions</td>
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<tr>
<td></td>
<td>--Recognize that different people may like different things</td>
<td></td>
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<tr>
<td>18 months-2 years</td>
<td>--Understand that imaginary objects are different from real objects</td>
<td>--Predict that receipt of broken toy will make child unhappy</td>
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<tr>
<td></td>
<td>--Understand that people’s actions can be determined by their desires, intentions, and thoughts</td>
<td>--Emergent altruistic behavior</td>
</tr>
<tr>
<td></td>
<td>--Understand that perceptual activity (seeing, being told) is in some way connected to knowing</td>
<td>--Emergence of sense of self</td>
</tr>
<tr>
<td></td>
<td>--Words like <em>remember, know, and think</em> appear in spontaneous speech</td>
<td>--Use words happy, sad, mad, scared</td>
</tr>
<tr>
<td></td>
<td>--Understand that different people can see different things</td>
<td>--Change doll’s affect by bringing suitable object</td>
</tr>
<tr>
<td>3 years</td>
<td>--Match emotion words happy, sad, mad, afraid to photographic faces</td>
<td>--Talk about causes and consequences of emotions (e.g., “Santa will be happy if I pee in the potty.”)</td>
</tr>
<tr>
<td></td>
<td>--Schematic facial recognition</td>
<td>--Use object and “friend” to change affect</td>
</tr>
<tr>
<td></td>
<td>--Know the situations that will provoke primary emotions (match emotion word to picture)</td>
<td>--Display self-conscious emotions: <em>embarrassment, pride, shame, guilt</em></td>
</tr>
<tr>
<td>Age Range</td>
<td>First Order Cognitive Theory of Mind</td>
<td>First Order Affective Theory of Mind</td>
</tr>
<tr>
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</tr>
</tbody>
</table>
| 4-5 years | --Pass false contents and false beliefs tasks  
---Can predict a person’s actions on basis of a person’s false beliefs  
---Understand not only what people see but also how it appears to them  
---Understand how access to information by seeing or hearing is causally related to knowledge and how knowledge and belief can be causally related to actions in the world (beliefs cause people to act in certain ways)  
---Recognize ambiguous figures | --Identify character’s feelings according to whether or not wishes are fulfilled | --A believes that B believes X  
---A believes that B feels | --Object and friend used to comfort baby to make father happy |
| 6-8 years | --Make appropriate judgments of situations in which one knows, remembers, forgets, or guesses  
Second order cognitive ToM  
---A believes that B believes X  
---A intends that B believe X | Second order affective ToM  
---A believes that B feels  
---A believes that B feels | --Can offer appropriate situations for emotions like jealousy, worry, pride, shame, guilt  
---Understand that one can have first one emotion and then a second emotion in response to a situation | --Use words proud, jealous, worried  
---Develop strategies for regulating emotions |
| 8-10 years | --Higher order theory of mind  
---Understanding of strategies to hide deceit and to detect deceit  
---Understand figurative language  
---Presentational lies (to make oneself look good in the eyes of others) | --Understand that one can have two concurrent emotions of opposite type in response to a situation  
---Recognize/understand sarcasm  
---Recognize social faux pas | --Emotional dissemblance (can hide emotions)  
---Can intentionally use facial expressions to mislead  
---Use of words relieve and disappointed emerge at preadolescence  
---Employ sarcasm | --Use words proud, jealous, worried  
---Develop strategies for regulating emotions |
<table>
<thead>
<tr>
<th>To Develop this Level</th>
<th>Characteristics of those ready for this level</th>
<th>Intervention Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre ToM/pre sense of self</td>
<td>-- not responsive readily to those around; no or limited referencing; --limited initiation of interaction</td>
<td>--develop emotional sharing, referencing, coregulation --mutual regulation --develop motor imitation, affective imitation, and imitation with objects</td>
</tr>
<tr>
<td>Sense of self/pretend/pre level 1 ToM</td>
<td>--responsive to those around; references; engages in turn taking; --requesting behaviors; --functional use of objects</td>
<td>--develop pretend behaviors --develop awareness of physical and psychological self; mutual regulation --develop autobiographical memory by self talk/parallel talk</td>
</tr>
<tr>
<td>Level 1 Tom</td>
<td>--demonstrates an emergent sense of self --engages in pretend</td>
<td>--awareness of what one knows, doesn’t know, remember, forget --child engages in reflection to develop autobiographical memory --identify nonsocial emotion in self --strategies to begin to regulate one’s own behavior/ emotions --cognitive flexibility – more than one way to do a task; cognitively reappraise situation</td>
</tr>
<tr>
<td>Level 2 ToM and +</td>
<td>--identify primary emotions --pass ToM level 1 tasks</td>
<td>--strategies for learning; think alouds; questioning the author --goal-directed planning, problem solving --reflection on one’s knowledge/emotions --self presentational skills</td>
</tr>
</tbody>
</table>
# Social Communication Rating Scale (Pre-ToM)

**Student____________________**

**Target behavior____________________________________________________________**

| 1 | Little or no understanding of desired behavior. Absence of skill, even with support. | Date:  
Example behavior and context: |
|---|----------------------------------------------------------------------------------|---|
| 2 | Minimal understanding of desired behavior. Some emerging skill with limited range of application with maximum support. | Date:  
Example behavior and context: |
| 3 | Basic or moderate understanding of desired behavior. Can apply in some contexts with moderate support. | Date:  
Example behavior and context: |
| 4 | Moderate to strong understanding of desired behavior. Can apply in a range of contexts with minimal support. Requires additional experience. | Date:  
Example behavior and context: |
| 5 | Strong understanding of desired behavior. Competent demonstration of skill across contexts with little or no support. | Date:  
Example behavior and context: |

Maximum support – can be environmental; manipulating toys and context
# Social Communication Rating Scale (ToM present)

**Student____________________**

**Target behavior____________________________________________________________**

<table>
<thead>
<tr>
<th>1</th>
<th>Little or no understanding of desired behavior. Absence of skill, even with support. No awareness or self-monitoring.</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Minimal understanding of desired behavior. Some emerging skill with limited range of application with maximum support. Awareness and self-monitoring must be explicitly taught.</td>
<td>Date:</td>
</tr>
<tr>
<td>3</td>
<td>Basic or moderate understanding of desired behavior. Can apply in some contexts with moderate support. Some awareness and self-monitoring behaviors displayed with supports and reminders.</td>
<td>Date:</td>
</tr>
<tr>
<td>4</td>
<td>Moderate to strong understanding of desired behavior. Can apply in a range of contexts with minimal support. Requires additional experience. Awareness and self-monitoring is more evident with some independence.</td>
<td>Date:</td>
</tr>
<tr>
<td>5</td>
<td>Strong understanding of desired behavior. Competent demonstration of skill across contexts with little or no support. Awareness and monitor; adjust own performance.</td>
<td>Date:</td>
</tr>
</tbody>
</table>

Example behavior and context:
References

Interventions with ToM Components

Baron-Cohen Mind Reading and Transporters Computer Programs


The Transporters computer program available at: www.thetransporters.com


Developmental, Individual Difference, Relationship-based (DIR®/Floortime™) Model


Early Start Denver Model


Hanen


**Joint Attention Symbolic Play and Engagement Regulation  JASPER**


**Let’s Face It Computer Program to Teach Facial Processing**

[http://web.uvic.ca/~letsface/letsfaceit/](http://web.uvic.ca/~letsface/letsfaceit/) (games and manual with ideas for teaching emotions can be downloaded free)


**Relationship Development Intervention (RDI)**


Social Communication Emotional Regulation Transactional Support SCERTS


Social Thinking


Other Computer Programs/Apps with Research Base

Face Say


Children's Books on Bullying/Emotions/Trickery

Bullying


Emotions


**Perspective Taking**


**Trickery**


**Computer Programs on Emotions**

Let's Face It! (web.uvic.ca/~letsface/letsfaceit/) Free set of research-based computer games to recognize faces and emotions

FaceSay Computer Computer Social Skills Games (home version $79; school version $245/5 students)
Language for Theory of Mind. Laureate Learning Systems, Winooski, VT.

Mind Reading (http://www.jkp.com/) You can explore over 412 emotions, seeing and hearing each one performed by six different people. There are also mini-stories to provide contexts. $125

Model Me Kids DVDs & Software (http://www.modelmekids-store.com/)

The Transporters (www.thetransporters.com/)

**iPad apps**

ABA Flash Cards - Emotions FREE
AutismXpress FREE; AutismXpress Pro $1.99
Avokiddo emotions $2.99
Dusty D. Dawg Has Feelings Too FREE
Eye Contact Zoo; Look in My Eyes (Restaurant, Steam Train, Dinosaurs, Mechanic) $2.99
Facing Up All Smiles FREE
Feelings Book $14.99
Feel Electric! (developed by the Electric Company and the US Military) FREE
FirstWords: Feelings $1.99
I Can Do Emotions $2.99
I Was So Mad -- Little Critter book $1.99
Kimochis Feeling Frenzy FREE
Learn Feelings for Preschool Kids $0.99
Moody Me FREE
Odd Face Out FREE
Social Skill Builder (Free sample app; full programs $89.99, e.g. My School Day, School Rules, Social Detective)
Smurks $3.99
The Social Express $89.99
Sosh $39.99
The Monster at the End of This Book; Another Monster at the End of This Book $4.99
Touch and Learn - Emotions FREE
Touch & Say FREE
Odd Face Out FREE
VolaFriends $1.99