

A Developmental Perspective for Promoting Theory of Mind

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Social neuroscience research has resulted in changing views of the theory of mind (ToM) construct. Theory of mind is no longer viewed as a unitary construct, but rather as a multidimensional construct comprising cognitive and affective ToM and interpersonal and intrapersonal ToM, each of which has differing neurophysiological/neuroanatomical foundations and behavioral manifestations. Clinicians working with persons with social communication/pragmatic communication disorders should consider evaluating these dimensions of ToM and the cognitive, social-emotional, and language components underlying them. Then they might use this information to develop a ToM profile for each client so they are better able to implement specific intervention strategies to target the linguistic and cognitive/affective foundations for ToM development. In this article, we describe the characteristics of developmental stages of affective and cognitive and interpersonal and intrapersonal ToM and how to match intervention goals and strategies to those stages. Some activities and strategies have empirical support; others are based on what is known about typical development and patterns of impairment. **Key words:** *intersubjectivity, intervention, joint attention, mental state vocabulary, metacognition, self-regulation, sentential complements, theory of mind*

THE ARTICLES in this issue of *Topics in Language Disorders* (Vol. 34, No. 4) explore theory of mind (ToM) from various perspectives. Neurophysiology, environmental influences, language skills, and behavioral manifestation of ToM deficits are considered in several types of populations.

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Effective and appropriate social communication/pragmatic language skills require a communicator to have a ToM. The concept of theory of mind emerged in the 1970s when Premack and Woodruff (1978) defined ToM as the ability to impute mental states to oneself and others. The term was rapidly adopted by developmental psychologists. By the late 1980s and early 1990s, deficits in ToM had become associated with autism (Baron-Cohen, 1995). Theory of mind deficits and delays in developing ToM, however, are not limited to children, adolescents, and adults with autism spectrum disorders (ASDs) and social communication disorders. Deficits in ToM underlie many of the social communication difficulties exhibited by persons with a variety of conditions, including language impairment (Ford & Milosky, 2003), deafness (see Stanzione & Schick, 2014, in this issue), attention-deficit/hyperactivity disorder, traumatic brain injury (Martin-Rodrigues & Leon-Carrion, 2010), Parkinson's disease, dementia (Freedman & Stuss, 2011), behavioral disorders, and psychiatric conditions (Baron-Cohen, 2011). Because ToM deficits are commonly associated with language impairment,

it is imperative that speech–language pathologists and other language specialists know how ToM develops, the effects of ToM deficits on social communication skills and discourse comprehension, the cognitive and linguistic foundations for ToM, and how to promote development of ToM.

THE THEORY OF MIND CONSTRUCT

Traditional ToM construct

Until relatively recently, ToM was viewed as a unitary construct wherein reasoning about the mental states and emotional states of self and others was considered to be one and the same cognitive ability. In this unitary view, the presence of ToM has been defined operationally based primarily on assessment tasks that required comprehension of another person's false beliefs. False belief tasks generally have involved questioning about other people's beliefs about the contents of a box (e.g., candies in a crayon box) or the location of an object (e.g., when a toy is moved to a new location). In such tasks, children are shown a crayon box and asked what they think is inside. After the children guess crayons, they are shown that their prediction was wrong—the crayon box actually contains candy. The experimenter then recloses the box and asks the children what they think another person, who has not been shown the true contents of the box, will think is inside. The children pass the task if they respond that another person will think there are crayons in the box, but fail the task if they respond that another person will think that the crayon box contains candy (Gopnik & Astington, 1988).

In the most common version of the false belief locations task, children are shown two dolls, Sally and Anne, who have a basket and a box, respectively (Frith, 1989). Sally also has a marble, which she places in her basket, and then she leaves the room. While she is out of the room, Anne takes the marble from the basket and puts it in the box. Sally returns, and the child is then asked where Sally will look for the marble. Children pass the task if

they answer that Sally will look in the basket, where she put the marble; children fail the task if they answer that Sally will look in the box, where the children know the marble is hidden, even though Sally cannot know this, since she did not see it being hidden there. For both of these tasks, children must be able to understand that another's mental representation of the situation is different from their own, and they must be able to predict behavior on the basis of that understanding.

New views of the ToM construct

There are at least two issues with this traditional view of ToM that require reconsideration—expansion of the ToM construct beyond cognition and extended development of ToM ontogenetically (both younger and older than previously thought). First, the traditional view is that ToM is a unitary construct that has to do with the cognitive aspects of knowing what another person knows. Consequently, assessments have focused on evaluating understanding of cognition—thinking about what someone thinks, knows, or believes.

In the last 15 years, however, neuroimaging studies have provided evidence that ToM is not a unitary construct. Rather, there are several different dimensions or types of ToM, each having differing neurophysiological/neuroanatomical underpinnings (Abu-Akel & Shamay-Tsoory, 2011; Frith & Frith, 2003; Northoff et al., 2006; Shamay-Tsoory, 2011). Dvash and Shamay-Tsoory (2014), in their article in this issue of this journal, identify cognitive and affective dimensions of empathy. Shamay-Tsoory's neuroscience group in Haifa, Israel, has been particularly active in documenting the neurophysiological/neuroanatomical and neurochemical bases of ToM. This work has shown that ToM can be differentiated into the traditionally recognized cognitive ToM, which involves thinking about the thoughts, knowledge, beliefs, and the intentions of others, along with a dissociable affective ToM, which involves thinking about and experiencing the emotions of others. That is, affective ToM can be further

differentiated into affective-cognitive ToM, which can be described as cognitive empathy (i.e., awareness of, or recognition of, the emotions of oneself or others) and affective empathy, which can be described as the ability to respond to the emotions of others (i.e., to feel as others are feeling). Other researchers have reported that ToM also differentiates into interpersonal ToM (thinking about the thoughts and emotions of others) and intrapersonal ToM (thinking about or reflecting on one's own thoughts and emotions) (Lucariello, Durand, & Yarnell, 2007; Northoff et al., 2006; Tine & Lucariello, 2012). Lucariello et al. (2007) and Tine and Lucariello (2012) have modified traditional ToM tasks to assess both interpersonal and intrapersonal cognitive and affective ToM (see examples in Table 1).

The second issue with the traditional view of ToM is that ToM does not suddenly emerge between ages 4 and 5 years. From the moment of birth, healthy infants in homes with caring adults attuned to their needs begin to develop the foundations of ToM. Infants attend to their caregivers, who look at them and talk to them.

Essentially from birth, newborns also attempt to reproduce mouth and facial movements of the caregivers. Some neuroscientists attribute these early imitation skills to the functioning of mirror neurons—neurons that are activated when one initiates a movement, but also when one sees someone else engage in that movement (Keysers, 2011). It is thought that these early interactions lay the foundations for affective ToM (Gallagher & Hutto, 2008). During the toddler and preschool years, children then begin to realize that they are separate from others and develop the social-cognitive and language skills that are associated with passing false belief tasks.

Clinical implications of the ToM construct

McPartland and Pelphrey (2012) suggested that findings from social neuroscience could be used to define subgroups of persons with disabilities with particular profiles. Researchers and clinicians could then work together to determine which profiles respond best to particular interventions. Using the

Table 1. Examples of Interpersonal and Intrapersonal ToM

	Interpersonal ToM	Intrapersonal ToM
Cognitive	Child sees a sponge painted to look like a rock, and touches it. Then child is asked: If another kid comes in, and does not touch the object, what will he think it is? (Must say other child will think it's a rock)	Child is shown a sponge painted to look like a rock and asked: What is this object? Then the child touches the sponge and is asked: What is the object really? What did you think it was before touching it? (Expected answers: <i>rock, sponge, rock</i>)
Affective	Child is told a story: "David falls and gets hurt, but tries to hide how he feels so that other kids will not laugh at him." Then child is asked: How does David really feel? How does David try to look on his face? Does he look happy, sad, or okay? (Must describe underlying feelings as being different from look on the face)	Child is told, "You are playing and fall down in front of some other kids and hurt yourself. You try to hide how you feel so that other kids will not laugh at you." Then child is asked: How do you really feel when this happens? How do you try to look? Do you look happy, sad, or okay? (Must describe underlying feelings as being different from look on the face)

cognitive and affective ToM framework, Baron-Cohen (2011) has described cognitive and affective ToM profiles in persons with a variety of psychiatric disorders as well as classic autism and Asperger Syndrome. Lucariello and colleagues (Lucariello et al, 2007; Tine & Lucariello, 2012) reported that children from low socioeconomic backgrounds had better interpersonal than intrapersonal ToM and children with ASDs had better intrapersonal than interpersonal ToM (Tine & Lucariello, 2012).

Clinicians working with persons with social communication/pragmatic communication disorders should consider evaluating all the dimensions of ToM (cognitive/affective and interpersonal/intrapersonal) and the cognitive, social-emotional, and language components underlying these dimensions. Then, they might use the results to develop a ToM profile for each individual so they are better able to implement specific intervention strategies to target the linguistic and cognitive/affective foundations for ToM.

In this article, we describe the developmental stages of affective and cognitive and interpersonal and intrapersonal ToM and match intervention strategies to those stages. We cite the evidence and provide a rationale for these intervention strategies, even though the developers of the interventions may rarely, if ever, refer to these ToM dimensions. Our intent is not to teach persons to pass the variety of ToM tasks that have been developed, but rather to use persons' performance on these tasks as an indication of how they interpret social experiences and discourse in the world. The goal is to teach the cognitive, linguistic, and social/emotional skills that underlie ToM so that individuals can use these skills to communicate and interact more effectively. This need for a different therapeutic approach is based on prior research that has shown that children and adolescents who have been taught explicitly to respond to ToM tasks often have shown little or no generalization from one ToM task to another. Furthermore, trained performance on ToM tasks has not translated to social competence in every-

day life (Begeer et al., 2011; Hadwin, Baron-Cohen, Howlin, & Hill, 1997).

At this time, there are no standardized assessments available to evaluate the multiple dimensions of ToM. Many research articles that have assessed ToM dimensions, however, include the protocols used, so one can develop a set of assessment tasks to be used informally as criterion-referenced tools. Some summaries of tasks are available. For example, Wellman and Liu (2004) describe a developmental set of cognitive ToM tasks employed in a number of studies. Pons, Harris, and de Rosnay (2004) describe tasks for evaluating affective ToM for children between 3 years and 11 years. O'Hare, Bremner, Nash, Happe, and Pettigrew (2009) and Liddle and Nettle (2006) provide examples of higher order levels of ToM tasks. Hutchins and Prelock (in press) are developing a standardized ToM test battery that evaluates some aspects of cognitive and affective ToM, although they do not explicitly distinguish between these ToM dimensions.

Table 2 shows the development of ToM and its precursors. Both cognitive and affective ToM move through several levels of development. First-order ToM, which develops between 4 and 5 years of age, involves thinking about what someone else is thinking or feeling. Second-order ToM, which emerges shortly after first order (or by age 7 years) in typically developing children, involves thinking about what someone is thinking or feeling about what someone else is thinking or feeling. Beyond second-order ToM, higher order cognitive and affective ToM involves tasks that require recognizing lies, sarcasm, figurative language, idioms, or understanding multiple embeddings (e.g., He *thinks* that she *hopes* that they *believe* she *loves* the gift). These skills typically develop between 8 and 12 years of age.

Precursors to these ToM stages begin in infancy. They involve reciprocal interaction/emotional sharing between infants and caregivers (called *primary intersubjectivity*), joint attention in reference to objects (called *secondary intersubjectivity*) (Gallagher & Hutto, 2008), a sense of self, pretend skills,

Table 2. Development of Theory of Mind

Age	Cognitive Theory of Mind		Affective Theory of Mind	
	Intrapersonal Cognitive	Interpersonal Cognitive	Interpersonal Affective	Intrapersonal Affective
Birth to 6 months		Primary intersubjectivity (emerges birth to 6 months)		
6–8 months	-Responsive joint attention		-Responds to emotional reactions of others -Contagious empathy	-Imitates expressions -Displays joy, sadness, disgust, anger
8–12 months		Secondary intersubjectivity (emerges 8-12 month)		
13–17 months	-Follows line of regard -Initiates joint attention on objects -Understands physical relation between a person's line of sight and their behavior; one sees what one looks at	-Behavioral regulation; initiates behavior request	-Uses emotional expression of caregivers as social reference for approach-avoidance	-Displays emotions of <i>happy</i> , <i>mad</i> , <i>sad</i> , <i>surprised</i> , <i>disgusted</i> , <i>afraid</i> -Seeks to change affect of another by direct contact -Coordination/coregulation of interactions
18 months-2 years	-Recognizes that different people may like different things or have different desires	-Emergent sense of self -Engages in pretend	-Consciously recognizes distress in others; predicts that receipt of broken toy will make child unhappy	-Emergent altruistic behavior: comforts another; changes another's or doll's affect by bringing suitable toy -Uses words <i>happy</i> , <i>sad</i> , <i>mad</i> , <i>scared</i>

(continues)

Table 2. Development of Theory of Mind (Continued)

Age	Cognitive Theory of Mind		Affective Theory of Mind	
	Interpersonal Cognitive	Intrapersonal Cognitive	Interpersonal Affective	Intrapersonal Affective
3 years	<ul style="list-style-type: none"> -Understands that people's actions can be determined by their desires, intentions, and thoughts -Understands that perceptual activity (seeing, being told) is in some way connected to knowing -Understands that different people can see different things 	<ul style="list-style-type: none"> -Understands that imaginary objects are different from real objects -Words like <i>remember</i>, <i>know</i>, and <i>think</i> appear in spontaneous speech 	<ul style="list-style-type: none"> -Matches emotion words to photographic faces -Schematic facial recognition -Knows the situations that will provoke primary emotions (can match emotion word to picture) 	<ul style="list-style-type: none"> -Talks about causes and consequences of emotions (e.g., "Santa will be happy if I pee in the potty.") -Uses object and "friend" to change affect -Begins to display self-conscious emotions: <i>embarrassment</i>, <i>pride</i>, <i>shame</i>, <i>guilt</i>
4-5 years	<ul style="list-style-type: none"> First-order cognitive theory of mind; predicts what someone is thinking or feeling -Passes false contents and false beliefs tasks -Can predict a person's actions on basis of a person's false beliefs -Perspective taking; understands not only what people see but also how it appears to them 	<ul style="list-style-type: none"> -Understands 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) -Future time travel for predicting physical changes -Recognizes ambiguous figures 	<ul style="list-style-type: none"> First-order affective theory of mind -Predicts what someone is feeling -Understands that emotions are caused by what someone thinks is the case, even if what they think conflicts with reality; predicts emotions based on false beliefs -Identifies character's feelings according to whether or not wishes are fulfilled 	<ul style="list-style-type: none"> -Sense of self through time - Episodic/autobiographical memory and future time travel -Can describe a personal situation in which they were happy, sad, mad, scared, and surprised

(continues)

Table 2. Development of Theory of Mind (*Continued*)

Age	Cognitive Theory of Mind		Affective Theory of Mind	
	Interpersonal Cognitive	Intrapersonal Cognitive	Interpersonal Affective	Intrapersonal Affective
6–8 years	<p>Second-order cognitive ToM; predicts what one person is thinking about what another person is thinking -A believes that B believes/thinks X -A intends that B believe/think X</p>	<p>-Makes appropriate judgments of situations in which one knows, remembers, forgets, or guesses</p>	<p>Second-order affective ToM; predicts what one person thinks/feels another person feels -A believes that B feels -A intends that B feel -Can offer appropriate situations for emotions like jealousy, worry, pride, shame, guilt -Understands that one can have first one emotion and then a second emotion in response to a situation</p>	<p>-Uses words <i>proud, jealous, worried</i> -Develops strategies for regulating emotions</p>
8–10 years	<p>Higher order ToM -Understands strategies to hide deceit and to detect deceit -Understands figurative language -Recognizes cognitive lies</p>	<p>-Uses metacognitive strategies for comprehending and monitoring comprehension</p>	<p>-Understands that one can have two concurrent emotions of opposite type in response to a situation -Recognizes/understands affective sarcasm -Recognizes social faux pas -Recognizes affective or white lies</p>	<p>-Emotional dissemblance (can hide emotions) -Can intentionally use facial expressions to mislead -Words <i>relieve</i> and <i>disappointed</i> emerge at preadolescence -Employs sarcasm -Tells affective or white lies -Tells presentational lies (to make oneself look good in the eyes of others)</p>

emotional recognition, and mental state vocabulary (Astington & Baird, 2005).

We have placed these precursors and ToM skills into 4 stages. Ideally, interventions for ToM should consider the cognitive, linguistic, and interactional underpinnings for cognitive and affective ToM and interpersonal and intrapersonal ToM at each developmental stage. Table 3 shows intervention goals and strategies for each of these 4 stages. The interventions described represent only some of the activities that can be used to develop the cognitive, linguistic, and social-emotional foundations at each stage. Interventions for very young or severely delayed children always begin at the earliest stage. Children and adolescents who have ToM deficits and are capable of working on first, second, or higher order ToM tasks still may need some focus on the earliest pre-ToM stages as well. Even high functioning adults with Asperger disorder may continue to exhibit deficits at the level of primary and secondary intersubjectivity. For example, clinicians might work with adolescents on comprehending sarcasm, which entails higher-order ToM, but simultaneously target increased joint attention with, or referencing of, others so the individual with ASD is better able to interpret the emotions and behaviors of others.

The remainder of this article describes the characteristics of each of these ToM stages and goals and intervention strategies associated with these stages. The activities and strategies are based on those that have empirical support or on what is known about typical development and patterns of impairment. (See Supplemental Digital Content A for evidence-based studies, available at: <http://links.lww.com/TLD/A35>.)

DEVELOPMENT AND FACILITATION OF TOM

Stage 1: Pre-theory of mind, engagement

Development and assessment

In typical children, this stage is between birth and about 18 months. From birth,

neurotypical children exhibit primary intersubjectivity or emotional sharing with others. In attuned intersubjective interactions with caregivers, babies share the emotions of their caregivers and mirror their expressions—the underpinnings for affective ToM. Children develop a variety of joint attention skills. By 6 months, they follow the line of regard of others (responding to joint attention), and by 8 to 12 months, they develop secondary intersubjectivity, employing joint attention to initiate a behavior request to get desired objects or actions (e.g., to obtain a food item or toy) or to initiate social joint attention simply for the sake of interaction (Mundy & Newell, 2007). In initiating social joint attention, neurotypical children also reference those they are interacting with. For example, they borrow the perspective of another person, they use others' reactions as a reference point to resolve uncertainty, they determine the emotional meaning of an unfamiliar person or object, and they determine the effect of their behavior on others. They recognize if someone is fearful or angry, responding by moving away, or if someone is happy by moving closer. It is critical for clinicians to recognize the difference between simple joint attention—looking at the same object the caregiver is looking at—and true social referencing—interpreting the intents and emotions of the caregiver. Mundy (2003) has an assessment tool, the Early Social Communication Scales (http://www.ucdmc.ucdavis.edu/mindinstitute/ourteam/faculty_staff/escs.pdf), that can be used to assess and distinguish among these types of joint attention. Once infants and toddlers are able to engage in initiating joint attention, they begin to coordinate or coregulate their joint attention with others by taking turns in interactions.

Intervention

In Stage 1, intervention begins by focusing on establishing engagement through activities involving emotional sharing or primary intersubjectivity (e.g., face-to-face interactions such as peek-a-boo) or secondary intersubjectivity in turn-taking activities with

Table 3. Interventions for Developing Theory of Mind

Characteristics of Level to Develop	Intervention Objectives Outcomes				
	Characteristics of Those Ready for This Level	Intrapersonal Cognitive	Intrapersonal Affective	Interpersonal Cognitive	Interpersonal Affective
Stage 1: Pre-ToM engagement -Primary intersubjectivity -Secondary intersubjectivity Stage 2: Pre-ToM -Sense of self -Pretend skills	-not responsive readily to those around; no or limited referencing -limited initiation of interaction -responsive to those around; references; engages in turn taking -requesting behaviors -functional use of objects	-motor imitation and imitation with objects -pretend behaviors -awareness of physical and psychological self; mutual regulation	-emotional sharing, referencing, coregulation -mutual regulation -affective imitation -foundations for autobiographical memory by self talk/parallel talk	-motor imitation and imitation with objects -pretend skills -descriptive language skills	-emotional sharing, referencing, coregulation -affective imitation -identification of primary nonsocial emotions in self and others -identification of emotions associated with situations
Stage 3: First-order ToM -Passes false belief contents and location tasks -Mental time travel; autobiographical memory and future thinking	-demonstrates an emergent sense of self -engages in pretend	-awareness of what one <i>knows, doesn't know, remembers, forgets</i> -cognitive flexibility; more than one way to do a task; cognitively reappraise situation	-reflection to develop autobiographical memory -identification of nonsocial emotion in self -strategies to begin to regulate one's own behavior/emotions	-vocabulary of sense verbs (<i>see, bear, smell, taste, feel</i>), mental state verbs (<i>think, know, guess, etc.</i>), and emotions words -determination of how others are cognitively appraising the situation -multiple meanings for words -figurative language -sarcasm -recognition of multiple factors in context that contribute to person's interpretation/ appraisal of situation -rules for conversational interactions	-Inference of persons' characters' emotions from situations -prediction of persons' emotions/behaviors in a situation -identification of nonsocial emotions in others -vocabulary for secondary emotions -attention to multiple features in context to interpret emotions -figurative language -sarcasm -recognition of complex, subtle emotions; nuances of emotions
Stage 4: Second-order ToM and higher -Figurative language -Metacognitive strategies -Conversational skills	-identifies primary/nonsocial emotions -passes ToM Level 1 tasks	-strategies for learning; think-alouds; questioning the author -goal-directed planning, problem solving	-reflection on one's knowledge/emotions -self-presentational skills	-recognition of multiple factors in context to contribute to person's interpretation/ appraisal of situation -rules for conversational interactions	-features in context to interpret emotions -figurative language -sarcasm -recognition of complex, subtle emotions; nuances of emotions -read conversational cues for turn taking and response to conversation

a toy. To be engaged with others and maintain interactions with others, all persons must respond to joint attention and initiate joint attention. They must notice what others are looking at as well as draw the attention of others to their own interests. A number of studies have sought to train responding to joint attention and initiating joint attention. Most of these studies employed a behavioral approach, focusing on teaching attending to a stimulus for tangible reinforcers (Meindl & Cannella-Malone, 2011). Few considered the role of social attention. That is, such studies have taken the *form* of responding to joint attention (eye-gaze shifting) but not the *function* of responding to joint attention (to coordinate attention); or the function of initiating joint attention to access an object, but not to reference and engage with a person. To ensure that the participant's behaviors are instances of responding to joint attention and initiating joint attention and actually function to obtain social attention, it is important that the behavior ultimately and demonstrably be maintained by social attention. Socially oriented responding to joint attention and initiating joint attention are frequently invoked through physical interactions such as tickling (Charman et al., 1997).

Responding to joint attention and initiating joint attention are separate skills requiring separate interventions. This is not surprising when considering the evidence from neuroimaging studies that responding to joint attention is associated with posterior cortical systems—the superior temporal cortex and the parietal, temporal, and occipital association cortices, whereas initiating joint attention is associated with the prefrontal association cortex and the orbital frontal cortex (Mundy & Newell, 2007). Initiating joint attention is more complex than responding to joint attention. Studies have not shown an increase in initiating joint attention as a result of an increase in responding to joint attention, but learning to imitate does tend to result in an increase in responding to joint attention (Ingersoll & Schreibman, 2006). Imitation activities may activate the mirror

neuron system that has been associated with empathic responding (Keysers, 2011).

Engagement with others requires that children participate in more than single isolated instances of responding to joint attention and initiating joint attention. Playful interactions and communication require ongoing coordination or coregulation of responding to joint attention and initiating joint attention. All participants in an interaction must be watching one another, know when they are to take their turn, and provide a signal to others to take their turns. Gutstein (2009) recommended that, for many persons with ToM deficits, interacting partners should amplify their emotions because individuals with ToM deficits fail to notice subtle emotional cues.

To encourage engagement and gain shared attention with a child, an adult should choose activities and objects that the child enjoys and offer them for play. If the child is focused on the objects, but not the adult, the adult intrudes in the play, holding back some materials, using parallel play and proximity to the child to allow the child to get used to having the adult in his or her space. During these interactions, adults also should seek to have children imitate actions, drawing attention to imitation by imitating the children's behaviors as well as seeking to have the children imitate the adults' behaviors. In our work on primary and intersubjectivity with older students, we make videos of interactions between adults and other students in which the participants amplify their emotional behaviors (facial expressions, vocal prosody and intensity, and body gestures). Students analyze and interpret the interactions. As students begin to identify the obvious cues, we make new videos in which the emotional cues are increasingly more subtle.

Several well-known interventions for ASDs, with varying degrees of empirical evidence, focus on activities that promote social engagement through responding to joint attention, initiating joint attention, and coordination/coregulation of responding to joint attention and initiating joint attention, for example, Relationship Development Intervention

(Gutstein, 2009); DIRFloortime (Developmental Individual-Difference Relationship-based Model; Greenspan & Wieder, 2009); the JASPER intervention (Joint Attention, Symbolic Play, Emotional Regulation; Goodes, Ishijia, Chang, & Kosari, 2013; Lawton & Kasari, 2012); the SCERTS model (Social Communication, Emotional Regulation, and Transactional Support; Prizant, Wetherby, Rubin, Laurent, & Rydell, 2006), and the *More Than Words* program (Sussman, 2012). (See research evidence on interventions in Supplemental Digital Content A <http://links.lww.com/TLD/A37>.) Gerber (2007) produced a DVD, *Visual Realty*, that demonstrates assessment and intervention to increase engagement. It can be viewed at <http://www.youtube.com/playlist?list=PL25410923E953E679>.

Stage 2: Pre–theory of mind, sense of self

Development and assessment

In neurotypical children, this stage develops between 18 months and 4 years, beginning with the emergence of a sense of self and pretend play. Awareness of a sense of self has often been assessed by placing a spot of rouge on children's faces and observing their response when they see themselves in a mirror (Lewis, 2014). Children with a sense of self show embarrassment, touching the spot on their faces, and even avoiding looking in the mirror again.

With a sense of self, children realize that they are separate from others, and they begin to notice that they might have different likes and desires from others, a foundation for ToM. They also begin to exhibit conscious affective empathy or altruism manifested by intentionally attempting to help or comfort another (Thompson & Newton, 2013). At this stage, children also begin pretending. For example, they can pretend to eat a plastic cookie without really attempting to eat it. A sense of self and pretending both involve development of cognitive intrapersonal ToM because they both entail the ability to reflect consciously on the representations children have of their appearance and behavior (Perner, 1993).

Between 2 and 5 years, neurotypical children learn to identify nonsocial emotions, essential for interpersonal and intrapersonal affective ToM. By 5 years of age, children are usually accurate in recognizing universal nonsocial emotions (*happy, sad, mad/angry, surprised, disgusted, afraid*) and associating these emotions with particular events and experiences such as, *The boy is angry because his bike was stolen; The girl is sad because her cat is sick* (Michalson & Lewis, 1985; Pons et al., 2004). Children in environments in which adults reflect on experiences also develop a variety of mental state words (e.g., *think, know, guess, remember*), and some evidence suggests that children who are exposed to more mental state words develop ToM earlier (see Stanzone & Schick, 2014, in this issue). When adults not only discuss with children what they have done or experienced, but also evaluate those experiences, children begin to develop the foundations for autobiographical memory for experiences (Fivush, 2011). Autobiographical memory involves remembering or *experiencing* oneself in the past. This is in contrast to semantic memory, which involves knowing some facts about an event. For example, young children might have semantic memory (also called *scriptal knowledge*) for things associated with a birthday party, such as getting gifts, eating cake and ice cream, playing games, but they might not yet have an autobiographical memory for their own last birthday. That is, they may not remember their personal experience at their own birthday party, such as not liking the cake, spilling juice on the carpet, or how they felt when they won a game. Autobiographical memory furthers people's sense of self, and hence, their intrapersonal ToM (Prebble, Addis, & Tippett, 2013).

Intervention

Pretend play is viewed as a precursor to ToM (Doherty, 2009) and targeting pretend play in intervention provides a way to develop many of the cognitive, social-emotional, and linguistic foundations necessary for ToM. One study showed that preschool children who were trained to pretend to take on mommy,

daddy, and child roles in topics about home, shopping, and school exhibited improved emotional recognition and improved performance on appearance reality tasks (recognizing that an object that looks like a rock is really a sponge), both of which are precursors to first-order ToM (Allen & Kinsey, 2013). Another study showed that elementary and high school students who participated in a class in creative dramatics, compared with those who participated in art and music, exhibited greater affective empathy and the high school students also exhibited increased performance on higher order ToM tasks (Goldstein & Winner, 2012). This study involved using creative dramatics to teach students explicitly to think about the mental and emotional states of the characters they were playing and to feel as the characters would feel, thus developing both cognitive and affective ToM.

In our clinical work, we assess children's developmental pretend play levels, using the Westby Playscale (Westby, 2000). Between 18 months and 4 years, children's pretense moves from pretend on oneself about familiar everyday themes with concrete props, to pretend on dolls or stuffed animals (first acting on and talking to the dolls and then talking for the dolls), to taking on familiar, observed roles (store cashier, doctor, firefighter), and finally to less familiar themes and roles with more abstract themes or no props. We develop play and language goals on the basis of the children's baseline developmental pretend play and language levels, and attempt to extend those levels through play. Initially, when themes are introduced, we act as directors or coplayers, scaffolding the play, modeling dialogue, and expanding children's utterances. In this way, language skills are developed along with symbolic play skills. Play themes provide opportunities to display emotions, interpret emotions, and respond to the emotions of others. For example, one child can pretend to be sad and worried because her dog is sick. The child can be scaffolded to take her dog to the vet, who can respond by being concerned but comforting. The vet

then treats the dog, the dog recovers, and the owner is relieved and grateful.

Children with ASDs often have rigid play scripts (e.g., playing pirate repeatedly in the same way). Introducing new and varied play scripts based on scripted plays or on storybooks with an emphasis on the emotional states of characters can target development of interpersonal cognitive and affective ToM. Reading a story with props and exposing the child to the story several times can lay the foundation for beginning to move the child to pretending within the story in a more creative way, using props such as an eye patch, parrot puppet, and pirate hat. The Play Prompt Hierarchy (Kasari, Fannin, & Goods, 2012) provides a system for evaluating how much support children require to play from requiring a general verbal prompt, for example, "What toy should we pick?" to requiring a full physical prompt in which the adult assists the child in obtaining and playing with the toy.

Language is also promoted through conversations about personal experiences. These types of conversational interactions are particularly helpful in promoting children's development of mental state and emotional vocabulary that are essential for supporting ToM (Howard, Mayeux, & Naigles, 2008). Staff at the New Mexico Preschool for the Deaf engage children in interesting activities with the intent to later have conversations about the experiences. For example, children took a field trip to a pumpkin patch to get pumpkins and have a hayride. At school they made jack-o-lanterns from the pumpkins. The activities were photographed and videoed. Clinicians, teachers, or parents then used the photos or videos to reminisce about the experience. They not only discussed what they did, but also evaluated the experience, remembering not only their behaviors, but also their thoughts, feelings, and interpretations. In reminiscing about the experiences in this manner, adults are promoting not only children's understanding and use of mental state and emotions words but also children's sense of self or intrapersonal ToM. Furthermore, these guided conversations highlight for

children that different people can have different subjective perspectives on the same objective event, thus promoting development of interpersonal ToM. For example, the children were excited to find a dead mouse in a smashed pumpkin, but the teacher felt disgusted. Children produced storyboards for the experiences. Photos of the activities were glued to a large poster board. The children dictated captions that were written under each photo; and when their parents visited, the children related the experiences using the storyboards to guide them. In this way, the storyboards supported the children reminiscing. According to Laible (2004a, 2004b), young children who have more opportunities to reminisce about emotional experiences show higher levels of emotional understanding and regulation (interpersonal and intrapersonal affective ToM).

Stage 3: First-order ToM

Development and assessment

First-order ToM involves reflecting on what someone is thinking or feeling. Classic first-order ToM tasks assess cognitive or affective false belief through false belief contents (e.g., candy in a toothpaste box) or false belief location (e.g., Sally-Ann task) activities. Neurotypical children usually pass first-order ToM tasks between 4 and 5 years of age. Passing ToM tasks is highly dependent on language skills, particularly mental state and emotion words, and comprehension of sentential complements with communication verbs (e.g., Cookie Monster *asked*, “Can I have another cookie?”) and mental state verbs (e.g., Ginny didn’t *think* she would win the spelling bee) (Hale & Tager-Flusberg, 2003).

With the development of first-order ToM, children’s understanding of emotions expands beyond nonsocial emotions to social emotions. Social emotions require the representation of the mental states of other people. Examples are embarrassment, guilt, shame, and pride. In contrast, basic emotions such as happiness, sadness, or anger require only the awareness of one’s own emotional state.

Children as young as 2 to 3 years can express emotions resembling guilt and remorse. Five-year-old children are able to imagine situations in which nonsocial emotions would be felt; however, the ability to describe situations in which social emotions might be experienced does not appear until 7 years of age (Harris, Olthof, Terwogt, & Hardman, 1987).

The cognitive and language foundations for autobiographic memory are being laid down in Stage 2. In Stage 3, between ages 4 and 5 years, children begin to exhibit *mental time travel*. This means that they can exhibit autobiographical memory for experiences, or the ability to think about themselves in the past, as well as *future mental time travel*, or the ability to think about themselves in the future (Atance & O’Neill, 2005). Mental time travel involves a sense of self and, therefore, it both requires and promotes development of intrapersonal ToM. Future mental time travel frequently involves counterfactual reasoning, which is the ability to think about alternatives to reality. Counterfactuals often take the form of “if-then” conditional propositions in which the “if” specifies a personal action and the “then” specifies a goal, for example, “If Matt had run, he would have caught the bus.” Engaging in role play promotes children’s counterfactual reasoning because they must consider what is reasonable/unreasonable or possible/not possible in a particular role. For example, *If I’m a vet, then I can give the dog a shot and bandage its leg. If I’m the dog’s owner, not the vet, then I can’t do surgery on the dog’s broken leg.*

Intervention

To develop affective ToM, children will need to continue to develop the ability to recognize emotions and the situations in which they occur. A number of DVDs, computer programs, and apps have been developed to teach emotions, some of which have evidence to support their use. *The Transporters* is a DVD program (www.thetransporters.com) that was developed to improve emotional recognition and understanding in children with ASDs aged 3–8 years. It has 15 stories

based around eight characters who are transportation vehicles. All vehicles have human faces showing emotions and are depicted as toys in a child's bedroom. *The Transporters* series was designed so that each emotion and mental state are not only labeled by the narrator but also explained in terms of its context. In one study, children who used *The Transporters* improved in recognition of the emotions and generalizing this emotional recognition to naturalistic clips of human characters not attached to vehicles (Golan et al., 2010).

Mind Reading is an interactive computer program developed for children and adults with ASDs to help them learn to recognize both simple and complex emotions and mental states from facial and vocal expressions (Baron-Cohen, Golan, Wheelwright, & Hill, 2004; <http://www.jkp.com/mindreading>). This program covers 412 distinct emotions and mental states, organized developmentally. Results from a treatment trial of *Mind Reading* (Golan & Baron-Cohen, 2006) found that adults with ASDs who used the program improved significantly more in their ability to recognize a range of complex emotions and mental states (e.g., *ashamed, jealous, panicked, arrogant*) compared with a matched control group with ASDs who did not use the program. Training with the software led to improvement on close generalization tasks using stimuli from the software, although there were problems with distant generalization tasks, which involved stimuli not included in the software. *Let's Face It!* is a free series of games (which can be downloaded from <http://web.uvic.ca/~letsface/letsfaceit>) that are designed to improve line of regard and face recognition abilities (Tanaka et al., 2010). Children with ASDs in the treatment group playing the *Let's Face It!* games exhibited significant improvements in face recognition (recognizing mouths in isolation and processing eyes holistically) compared with a control group with ASDs.

Picturebook stories also can be used to develop interpersonal cognitive and affective ToM (Adrian, Clemente, & Villanueva,

2007; Nikolajeva, 2013; Slaughter, Peterson, & Mackintosh, 2007). Books by Jan Thomas are particularly useful for teaching mental state and emotions words and developing ToM. The books are geared toward preschool children, but they can be used with children through mid-elementary school. Each book typically has a single episode story told primarily through the voices of its animal characters. The amount of text is minimal. The characters' expressions are superb. In her drawings, Thomas conveys various emotions—not only happy, sad, frightened, and angry, but additional emotions such as surprised, frustrated, concerned, puzzled, worried, enthusiastic, disappointed, confused, and relieved. The emotions are conveyed through the characters' eyes/eyebrows, mouths, and body stances. The plots of the stories trigger the characters' emotions and the emotions carry forward the stories.

The Doghouse (Thomas, 2008) encourages children to predict what the animals are thinking that would cause them to be afraid. Mouse, Pig, Cow, and Duck are playing a game of ball when Pig accidentally kicks the ball into the doghouse. They all look worried as they ask, "Who will get it out?" Mouse volunteers each animal in turn to go into the doghouse. He justifies his decisions, for example, Mouse says, "Cow will. Cow is big, brave, and strong." Cow goes in but does not come out. Pig tries next, as Mouse deems him smart, wise, and stinky. Pig takes offense at the "stinky" designation but proceeds into the doghouse. Pig does not return either. As the story progresses, the animals look more frightened. This facilitates teaching a continuum of words for fear—*worried, scared/frightened, terrified, petrified*. Duck, who is noisy, goes last—and disappears just like the others. Mouse is now the only one left outside. He timidly calls out, "Can't you come out, Duck?" Dog appears in the doorway and says, "No! Because I am having duck for dinner." Mouse assumes the worst—that the dog is eating the duck (he has a false belief), but the last spread shows all the animals inside the dog's house sitting down to a meal. Mouse joins the party on the

endpapers, just in time for dessert. Following reading and discussing the story, the children enact it.

Because ToM skills are highly correlated not only with mental state and emotional vocabulary, but also with syntax, it is important that children's syntactic skills be evaluated and developed along with targeting ToM development. Wilson (2012) is producing a series of CDs to teach the language structures underlying ToM, beginning with verbs of perception (*bear, see, smell, taste, feel*) and verbs of intention/desire (*want, need, like*). Additional CDs to be developed will teach verbs of communication (*say, tell, ask*) with sentential complements and verbs of cognition (e.g., *know, don't know, think, believe, guess, remember, forget*) with sentential complements. Research studies training children on sentential complements not only resulted in their acquiring the linguistic knowledge fostered by the training, but also significantly increased their scores on a range of ToM tasks (Hale & Tager-Flusberg, 2003). Questions using communication and mental state verbs can easily be asked about the Jan Thomas stories, for example, "What did mouse *say* to cow?" Answer: "Mouse *said*, 'Cow will. Cow is big. Cow is strong. Cow is brave.'" "What did Mouse *think* when the dog said he was having duck for dinner." Answer: "Mouse *thought* that dog had eaten duck."

We also teach sentence structures with adverbial dependent clauses to explain when and why characters' feelings in stories occur. Table 4 shows some examples based on the story, *Yeh-Shen*, a Chinese version of Cinderella (Louie, 1996). The adult puts the character names and the *when* situations in the chart and students then complete the chart by putting in the appropriate feelings and explanations. The adult then models how the concepts can be expressed, for example, "When the fish talked to Yeh-Shen, she felt happy and contented because she now had a friend" or "The stepmother was resentful and jealous when she found out about the fish because she didn't want Yeh-Shen to have anything that would make her happy."

To foster development of episodic memory (and intrapersonal ToM), clinicians can use journal writing or journaling, using a video camera. After making a video of a favorite activity such as a family vacation, allow children to watch the video, commenting on how they felt at the time of the episode depicted on the screen, what they did, and how much fun they had. Have the children talk about the experience, first while watching the video, and then when not watching the video. As part of autobiographical memory activities, mental time travel can be facilitated. After reminiscing about an experience, children can talk about what could have happened if at different points in the experience they had done something differently. They can make plans regarding how they might do the activity in the future, particularly when an activity did not work out as intended. Adults can model the use of counterfactuals—"if we . . . then" "if we do not . . . then" regarding what they could or could not do the next time to make the activity more fun or to accomplish a particular goal.

Stage 4: Second-order ToM and higher

Development and assessment

For neurotypical children, this stage begins immediately after their development of first-order ToM. Second-order ToM, which involves predicting what one person thinks or feels another person is thinking or feeling, generally develops by the age of 7 years. Higher order ToM develops after the age of 7 years. Cognitive and affective interpersonal ToM involve multiple embeddings (Sarah *hoped* that Joe would *believe* that she *knew* what Mrs. Brown *wanted*) or comprehension of lies, sarcasm, figurative language (where what is said is not what is meant) or faux pas (where what is said causes unintended harm).

Although most research has focused on cognitive ToM tasks at first, second, and higher order, assessment tasks at all these levels can involve either cognitive or affective ToM. For example, a lie can be cognitive (e.g., taking

Table 4. Syntactic Frame for Expressing Emotions Based on Stories

Person/Character	When	Feeling	Why
Yeh-Shen Stepmother	the fish talked to her stepmother found out about the fish	happy, contented, joyful jealous, resentful	she had a friend she didn't want Yeh- Shen to have anything that would make her happy
Yeh-Shen	stepmother ate the fish	sad, forlorn, distraught	she had lost her only friend.

Note. These examples are related to the story, *Yeh-Shen*, a Chinese version of Cinderella (Louie, 1996).

your friend’s iPad and saying you have not seen it when she asks if you know where it is) or affective (e.g., telling your aunt you love her rhubarb pie even though you think it is disgusting), or sarcasm can be cognitive (e.g., saying, “What a tidy office,” when walking into an office with books scattered all over the floor and chairs and the desk piled with papers in disarray) or affective (e.g., saying, “What a good father you are,” when the father has forgotten to pick up his son after school).

Many of the higher order intrapersonal cognitive and affective ToM skills are associated with metacognitive and self-regulation skills. Metacognition refers to learners’ awareness of their own knowledge, emotions, and strategies for learning and managing emotions. Self-regulation refers to the use of processes that motivate and sustain thoughts, behaviors, and affects to attain goals (Zimmerman & Moylan, 2009). Learners with good metacognitive and self-regulatory skills are able to monitor and direct their own learning processes and social interactions.

Intervention

Explicit teaching of figurative language, including metaphors, idioms, and sarcasm, is a part of the Common Core language arts curriculum from mid-elementary through high school. In addition to addressing these specific language needs at stage 4, we give considerable attention to developing metacognitive (intrapersonal cognitive ToM) skills and

emotional regulation (intrapersonal affective ToM). Improved intrapersonal ToM can contribute to improvements in interpersonal ToM when persons evaluate what they know, do not know, and need to know in particular situations. This reflection can cause persons to consider more closely and evaluate the actions of others.

Think-alouds can be used to teach the ToM skills that students need to monitor their comprehension as they view pictures or read. Using such an approach, the speech-language pathologist or teacher models a think-aloud by verbalizing what he or she is doing to attempt to make sense of what he or she is seeing or reading. Think-alouds require both intrapersonal and interpersonal ToM. Students must first be able to recognize whether or not they are comprehending; if they are not, they must reflect on the strategies they could use (intrapersonal ToM) to understand why the characters in a story are doing what they are doing, and as they interpret the behavior of characters in the stories, they must use their interpersonal cognitive and affective ToM. Traditionally, students are asked to use think-alouds as they read a text. They read a portion of the text and then stop to describe how they are making sense of what they are reading—what they understand or do not understand; how they are trying to make sense of what might be confusing; the inferences they are making about the characters and what evidence they use to make

these inferences. This provides the opportunity for clinicians to scaffold higher level thinking and affective sensitivity. For students with language-learning and reading impairments, doing think-alouds while reading can be particularly challenging because of the load placed on working memory, particularly if students have to struggle with decoding while they simultaneously are expected to reflect on their processing of the text. For this reason, we initially teach think-alouds with pictures. We have found the books *The Invention of Hugo Cabret* (Selznick, 2007) or *Wonderstruck* (Selznick, 2011) particularly useful for students from upper elementary school through high school. These books are 530 and 630 pages, respectively, but more than half of the pages are pictures. The pictures do not represent the printed text, but rather are their own “texts.” (See the components of a think-aloud and a sample think-aloud from the *Invention of Hugo Cabret* in the Supplemental Digital Content B for this article, available at: <http://links.lww.com/TLD/A36>).

The think-aloud strategy can be integrated with the questioning-the-author strategy (Beck & McKeown, 2006). When using questioning-the-author strategy, clinicians or teachers first remind students that texts have been written or drawn by someone. They then say that to understand the texts, it can be helpful to try to figure out the author’s intent (which requires interpersonal cognitive ToM). Clinicians and teachers then can guide students to begin to see the difference between what the author actually says and inferring what the author probably means. In *The Invention of Hugo Cabret*, when Isabel asks Hugo, “Why are you so interested in my key?” the clinician can point out that students watched a video of Brian Selznick, the book’s author, demonstrating how a real automaton needed to be wound by a key to work and that he had made the key a central part of his story. The students then can be encouraged to make suggestions about where the key came from. Finally, the clinician/teacher validates the students’ suggestions and asks for evidence that

the author may have provided to support the students’ ideas.

Students also can learn to employ metacognitive skills to reflect on and analyze their emotional responses to situations. This requires that they use both intrapersonal cognitive and intrapersonal affective skills. The goal of the STAMP program (Stress and Anger Management Program; Scarpa, Wells, & Attwell, 2012) is to teach children to recognize and regulate their own emotions (intrapersonal affective ToM). Children first are taught about the range of emotions (e.g., varying intensities of happy or angry), the vocabulary for the emotions, and how to recognize their body cues that signal when they are happy, stressed, or angry. Then they are taught how to use an emotional toolbox, which consists of strategies they can use to help them deal with their anger and anxiety, and cognitive restructuring, which includes changing the way they think about something so they have more positive feelings and actions. STAMP emphasizes the use of self-talk, which is a metacognition/intrapersonal ToM target. Self-talk has an effect on internal states and internal states have an effect on how one interacts with others (thus affecting interpersonal ToM) (Gross, 2008).

Superflex is a curriculum designed to teach elementary school students how to regulate their behaviors and become stronger social problem solvers by employing intrapersonal cognitive ToM (although the authors do not specifically refer to ToM) (Madrigal & Winner, 2008). Children learn to associate patterns of thought with Superflex, a hero who has flexible thinking and a Team of Unthinkables, a set of characters who have inflexible thinking. For example, the Unthinkable character, Rock Brain, does not want to listen to others’ ideas and keeps trying the same social strategy over and over again. Superflex tries to avoid Rock Brain by listening to others’ ideas and trying a different social strategy. Superflex and his pals visually and explicitly model to students what might be happening to them when they are not having social success, as well as strategies that

can help them achieve a more positive social result.

Southam-Gerow (2013) offers a variety of strategies to develop intrapersonal and interpersonal ToM for upper elementary school children and adolescents. The techniques were developed for children with poor emotional awareness, limited emotional understanding, poorly developed empathy skills, or children who have poor emotion regulation. Clinicians present vignettes, talk about how the person might feel, and then add information and ask how this new information will change the way the child thinks that person might feel. Consider the following example from Southam-Gerow:

First, the clinician sets the scene by saying, "Darius's neighbor just got a new dog that really likes kids." The clinician then asks how the child thinks Darius might react to the dog. Following this discussion, the clinician adds some new information to the vignette, saying, "Darius's neighbor just got a new dog that really likes kids, but Darius was once bitten by a dog." The child is next asked how he now thinks Darius will react to the dog now; how might Darius's feelings change given that he has had a traumatic experience with the dog?

By varying the parameters of the situation, the goal is to teach children to develop flexibility in their thinking so they can begin to understand why a social strategy that might work in one situation may not work in another. Students are taught to consider multiple factors when inferring the thoughts and feelings of others as well as when recognizing their own thoughts and feelings. These strategies fit well with the concept that persons with ASDs may be considered to be "context blind" (Vermeulen, 2012). That is, even when individuals with ASDs are able to recognize emotional facial expressions, they may not recognize how other contextual factors in the specific situation might influence people's thoughts and feelings. Contextual factors could include the setting for the situation (familiar/unfamiliar; formal/informal), the age and gender of the persons, the intentions of persons in the situation, or persons' experiences.

By the time neurotypical children comprehend second-order and higher ToM, they are engaging in complex peer social interactions. These interactions prove to be quite difficult for students with ToM deficits because they require integration of all ToM dimensions. Brinton, Robinson, and Fujiki (2004) used the Conversation Game to teach the skills needed for conversation. The game combines video analysis, role-play, and practice conversations to promote conversational skill development, perspective taking, awareness of, and responding to the needs of the conversational partner. Movie clips not only help students recognize conversational cues in real time with real people but also allow clinicians to pause the clip, rewind, and watch again focusing on one character's perspective and then another's. Creating clips of social situations loosely based on the life of the student can be helpful in targeting specific social situations without subjecting the student to psychological stress. A clip of a mother and daughter arguing over why the daughter cannot take the car contrasted with a second clip of the same mother and daughter resolving their conflict over the car can be used to explicitly teach the student what the mom and daughter are thinking and feeling.

CONCLUSIONS

Theory of Mind deficits lie at the heart of autism and are major contributors to pragmatic language difficulties exhibited by children and adults with a wide variety of conditions. ToM is not a unitary construct. In the last 15 years, neuroimaging studies have provided evidence of distinctive dimensions of ToM. Cognitive ToM, affective cognitive ToM, and affective empathy have differing neuroanatomical foundations. Furthermore, thinking about the thoughts or emotions of others (interpersonal ToM) and reflecting on one's own thoughts and emotions (intrapersonal ToM) involve differing neurophysiology and appear to involve different skill sets. Clinicians working with persons with pragmatic communication disorders should

consider evaluating these types of ToM in their clients so they can develop a ToM profile for each client with needs in this area. In that manner, they will be prepared better to implement specific intervention strategies to promote development, some of which have been reviewed in this article. Interventions should then be directed to developing the cognitive, social-emotional, and language foundations for ToM.

Our goal for this article is to enable service providers to locate and use a variety of clinical tools to promote ToM across the life span. The research literature indicates that children with disabilities most likely follow a developmental trajectory similar to that of neurotypical children, but at a slower rate (Conti-Ramsden et al., 2012). Hence we, typically select goals based on students' present developmental levels in each ToM dimension. However, there are other issues to consider when selecting goals. For example, just because a skill develops at a particular time in typical

development does not necessarily mean that that skill is a precursor to a later developing skill. Therefore, when establishing intervention goals, service providers should ask two questions: (1) What is the child ready to learn? and (2) What would help communication the most? (Brinton & Fujiki, 2010). The first question addresses the developmental issue and the second addresses the functional aspect of all communication. Each ToM dimension has its own developmental trajectory (Lucariello et al., 2007; Sebastian et al., 2012). The intent of the interventions is not to teach persons to pass a hierarchy of ToM tasks, but rather to learn to interpret social experiences and discourse in the world. Consequently, when establishing intervention goals for persons with ToM deficits, service providers need to consider both the persons' developmental strengths and needs in each ToM dimension and the contextual social expectations or demands in home, school, and community.

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