

The development of a standardized measure of social competence in middle childhood:
Beginning to bridge the gap between empirical knowledge and clinical practice

by

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Abstract

Our understanding of children's social competence has increased tremendously over the past two decades. There is increasing evidence to suggest that social and emotional impairments are not restricted to children with autism, but rather may be associated a host of neurological conditions including acquired brain injury, learning disabilities, attention deficit disorder, and stroke. Although many investigators have begun to bridge the gap between clinical practice and research by applying experimental tasks to clinical populations, very few tools are available for the everyday clinical evaluation of social competence. This study aimed to take the first steps in the development of measures that would be suitable for the assessment of children between the ages of 6- and 12-years of age. The results of the study provide cross-sectional normative data for a number of tasks that have been developed and modified with clinical practice in mind. A discussion of the developmental progressions and the relationships among different aspects of social competence is also included.

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Introduction

Neuropsychologists are often called upon to provide a comprehensive assessment of a patient with known or suspected neurological difficulty. The assessment typically includes an evaluation of the patient's skills in a number of cognitive domains (e.g., memory, language, visual-spatial skills), as well as an investigation of psychosocial well-being (e.g., mood, psychiatric disturbances). In the case of children, referrals for assessment often originate with parental concern for a child's behaviour, or a teacher's concern about the child's performance in school. It is not uncommon for a referral question to include issues regarding the child's ability to interact with his/her peers. Concerns such as: "My child has difficulty making and keeping friends" or "My child does not fit in with other children his/her age" are often raised, even when the primary reason for referral is something else (e.g., poor school performance). In guiding their evaluation, neuropsychologists rely on standardized tools of assessment to provide normative information about a child's performance relative to his/her peers in a particular domain. Unfortunately, the paucity of measures of social interaction skills hinders the neuropsychologist's ability to form a complete picture of a child's difficulties in this area. Moreover, without appropriate and reliable measures, treatment interventions and remediations cannot be recommended with confidence, as there is no way to objectively evaluate their effectiveness.

The relevance of standardized measures of social interaction skills in clinical neuropsychology can be understood in the context of two goals for the neuropsychologist:

1. To be able to provide a well-rounded, objective assessment of a child's performance in cognitive, socioemotional and behavioural domains that are relevant to the concerns about a child's performance and/or behaviour.
2. To have increased knowledge and understanding of the mechanisms underlying children's difficulties in various cognitive, socioemotional and behavioural domains such that appropriate and effective treatment interventions might be developed, and empirically evaluated.

To date, very few measures exist in the domain of social interaction skills. The measures that do exist, tend to focus on specific aspects of a child's ability (e.g., theory of mind, understanding nonverbal cues), rather than examining a broad range of relevant skills. In order to properly understand which are the relevant skills, clinicians need to consider the various types of abilities that are associated with effective social interaction, and the relationships among them. The following discussion outlines some of the better understood constructs that could be considered as falling under the larger domain of "social competence". A discussion of some of the specific areas of development in middle childhood is included, as a large number of children referred for assessment range between the ages of 5 and 12 years of age. Finally, the relationship between cognitive and emotional skills and their development is then discussed briefly as it is relevant to choosing which types of skills should be evaluated by a global measure, and how they should be seen as contributing to children's performance in everyday life.

The construct of “social competence”

The concept of “social competence” used in this study was built upon Carolyn Saarni’s earlier conceptualization of “emotional competence” (Saarni, 1999). Emotional competence refers to one’s ability to interact appropriately and self-efficaciously in social transactions. In order to demonstrate emotional competence throughout one’s lifespan, an individual comes to possess important knowledge and skills about emotions that are derived from ongoing cognitive development and socialization processes. In her model, Saarni (1999) outlines at least eight important skills for emotional competence, including awareness of one’s own emotional state and the ability to discern others’ emotions. Although she acknowledges that emotional incompetence may have its origins in biology, she emphasizes that dysfunction becomes most apparent when we have to relate to others. Emotional experience is considered individualized, or contingent upon an individual’s specific context, social history and current level of cognitive developmental functioning (Saarni, 1999).

Saarni’s conceptualization of emotional competence includes an important role for cognitive representational abilities, although her focus is clearly upon skills and experiences related to emotion. She suggests that “as children’s cognitive capabilities become more complex, they are able to construct a more sophisticated understanding of expectations for emotional experience, in themselves as well as in others,” (p. 75, Saarni, 1999). In other words, a certain level of cognitive ability may be required for the attainment of higher levels of emotional understanding.

The concept of “social competence” expands on Saarni’s notion of “emotional competence” by not only considering the *emotional* aspects of social transactions, but also including skills and awareness of other aspects of social interaction involving *cognition*, such as false-belief and intentionality. Not only might these skills lay a necessary foundation for the development of emotional understanding, but they themselves may contribute to effective social behaviour.

With a similar emphasis to Saarni’s model, both the cognitive and emotional aspects of “social competence” are considered within the social context. Certain aspects of cognitive development are particularly sensitive to socialization processes. These are frequently labeled “social cognition”, and include terms and concepts such as “theory of mind”, interpretation, figurative language, influence of personal characteristics on thoughts. The ongoing relationship or intertwining of cognitive and emotional skills that is discussed by Saarni (1999) and others (e.g., Lewis, Sullivan & Michalson, 1984) is reflected here as well. Combining the areas of “social cognition” and “emotional competence” under the heading of “social competence” gives a broader picture of skills that are important for effective social interaction, understanding, and even a sense of self-efficacy. As will be discussed, research and clinical reports suggest that skills of “social competence” may play a critical role in the development of socially appropriate behaviour, social understanding, and self-concept.

The development of specific skills and abilities of social competence in middle childhood

The number of arguably separable content areas beneath the umbrella of “social interaction” is vast, and too extensive for the scope of this paper. However, based on a

detailed review of the literature, a certain family resemblance between the development of mental state awareness and emotional understanding is clear. It is these areas that will be the focus of this discussion. In the pages that follow, it will be argued that these developments are central to the acquisition and deployment of social interaction skills.

In very young children, the development of mental state awareness and emotional understanding each begin with a series of rudimentary behaviours observed in infants and toddlers that suggest some awareness of seemingly complex concepts such as “social referencing” and emotional expression (see Harris, 1989 for a review). For example, Klinnert (1984) presented toys to babies of 12 and 18 months of age. As each toy was introduced, the infant’s mother adopted either a fearful or smiling expression. Later, when similar toys were presented, the infants tended to approach the mother more quickly, and remain close to her when the toy was similar to the “fearful” condition but not in the “smiling” condition. Such findings suggest that even young infants are able to combine insights about others’ mental states with their understanding of emotional expression in determining their own social behaviour.

As the preschooler develops language skills, this awareness becomes more explicit with the basic recognition, comprehension and usage of mental state terms such as *want*, *believe*, *wish*, and emotion labels such as *happy*, *sad*, *scared* (Feldman, 1988; Shatz, Wellman & Silber, 1983). Social interactions are also altered as the child begins to understand more about the concepts of the mind, the self, and the role of context in determining thoughts and emotions (Schwanenflugel, Fabricius & Alexander, 1994).

Since the tendency of investigators has been to consider mental state awareness (or “theory of mind”) and emotional understanding as independently developing entities,

each will be considered here in turn, beginning with the understanding of other's mental states. By their fifth year, the majority of children can appreciate that appearance can be distinguished from reality (Flavell, 1993), that people can lie (Sodian, 1991), and that they can be mistaken (Wimmer & Perner, 1983). Some investigators argue that by the end the fifth year, a child's understanding of mental states is fully developed and, for all intents and purposes, matches that of any adult. Subsequent development, it is argued, comes about not through conceptual advances in wisdom about such matters, but rather through simple practice effects and prolonged experience (Perner, 1991; Perner & Davies, 1991; Perner & Wimmer, 1985). Others have argued for a more protracted developmental course in the understanding of minds, and suggest that the level of facility achieved by the fifth year represents only a small part of a more mature or adult view of mental states and their relation to social interactions (Carpendale & Chandler, 1996; Chandler, 1988; Chandler & Lalonde, 1996). The discussion that follows aims to elaborate on some of the areas of research suggesting not only that children do seem to acquire additional wisdom and skill after the fifth year, but that this increase in knowledge is represented in children's everyday behaviours. The discussion begins with behaviours that are argued to indicate direct inferences about the contents of other persons' minds (i.e., an understanding of false belief, lies, and sarcasm).

False belief, intentional deception and sarcasm

The young child's ability to recognize a mistaken belief arising from lack of information or experience is well documented using the standard "false belief stories" procedure. In the prototypical story, one character sees an object placed in location A. Once that character has left the room, another character moves the object from location A

to location B, upon which the subject is asked to determine where the first character will look for the object when s/he returns to the room. It is commonly acknowledged that a turning point in the development of false belief understanding occurs between the ages of three and five years: Three-year olds are said to lack an appreciation of false belief while five-year olds are said to have it (for example, see Flavell, 1993). Prior to developing this type of mental state awareness, young children, while admitting that the story character did not see the object being moved, will nevertheless insist that the protagonist will know where to look. Three-year olds will explain this anomaly by saying the character will look for the object in location B because that is where the object is. Typical five-year olds will say that the character will look in location A because that character did not see the object moved to the new location and therefore does not know it is really at location B.

Following closely on the heels of this discovery, children who come to understand that beliefs can be false, also learn that false beliefs can be engineered – in other words, they learn how to lie (Sodian, 1991). Since we gain knowledge from experience and perception, it follows that a lack of perceptual access to information – not seeing the object being moved – can lead to misunderstanding. Once children grasp the relation between perceptual access and belief formation they also seem to realize that by manipulating the perceptions and experiences of others, one can also manipulate the types of beliefs they might hold (Hala, Chandler & Fritz, 1991; O'Neill & Gopnik, 1991).

Understanding what others think or believe is a complicated matter, and it typically involves more than simply seeing whether or not an object has been moved. More sophisticated relatives of standard false belief tasks require children to make

predictions, not about what another person thinks, but about what one person thinks about what another person thinks – their beliefs about beliefs. For example, Johnny's mother does not know that he has found the birthday present she had hidden from him in the closet. She *believes* that Johnny does not *know* what he is getting for his birthday (she *thinks* that Johnny *thinks* that...). Perhaps not surprisingly, young children who otherwise successfully complete first-order tasks routinely fail these more complicated tasks (Perner, 1988). These "second-order" false belief tasks involving recursive thinking about beliefs are not typically passed by children until the ages of six-to-nine years (Perner, 1988).

It can be argued that part of understanding false belief or deception involves an awareness that what is said is not always what is meant. In the case of intentional lying, it is not intended that a person understand the true meaning of the deceitful statement – a part of what it means to tell a lie is to keep this deceptive intention private. In the case of other forms of communication that involve an awareness of mental states and intentions such as jokes or sarcastic comments, however, an appreciation of this intention is precisely what is needed in order for the communication to be effective (Leekam, 1991; Perner, 1988). A sarcastic remark is meant to contain both a true and false meaning – a compliment and a criticism (e.g., "Your new shoes look great"). Recognizing the *intention* in such communications appears to be more difficult than recognizing a simple false belief based on ignorance or lack of perceptual access to the truth (e.g., He didn't see the object being moved). Leekam (1991), for example, reports that only by the age of eight or nine were children consistently able to distinguish a joke from a deceitful remark. Similarly, Demorest, Meyer, Phelps, Gardner & Winner (1984) gave adults and

children (6 to 13 years of age) stories in which they were asked to identify sincere remarks, deliberate lying, and sarcastic remarks. While all children were able to correctly identify sincere remarks, the authors noted improvements in the identification of deliberate lying between six and thirteen years, and improvement in identification of sarcastic remarks between thirteen years and adulthood. Such findings suggest that acquiring a theory of mind, or understanding what others “know” demands more than a simple appreciation of what they “see” or what they “say”.

Interpretive theory of mind: Life beyond false belief

In response to the ongoing debate over what happens to a child’s developing theory of mind beyond the passing of false belief tasks, several researchers have proposed the existence of a more subtle and complex level of mental state understanding. According to one explanation, children’s ongoing development in middle childhood represents a transition from holding a *copy* theory of mind to an *interpretive* theory of mind (Chandler, 1988; Chandler & Helm, 1984). Individuals in possession of a copy theory of mind are able to understand that what a person sees can determine what they know – in other words, they appreciate that direct perception can lead to knowledge. Thus, in standard false belief tasks, a character holds an incorrect belief because s/he has not been privy to an essential piece of information. For example, John will not know that the scissors are now in the top drawer, if he did not *see* his sister put them there. He *believes* that the scissors are on the counter where he left them. By this model, children who are able to understand that ignorance can lead to false belief are said to possess a copy theory of mind – beliefs are a copy of reality.

In contrast, those with an “interpretive” theory of mind, understand that even when access to all of the essential information about some event is unrestricted, people are still free to hold different beliefs about the event. For example, Margaret and Tim are looking at an abstract piece of art. Margaret *believes* it is a picture of a dog, while Tim *believes* it is a flower. Some have proposed that it is not until middle childhood that children begin to appreciate that a single situation, object, or event witnessed in exactly the same way by two individuals, can be subject to multiple interpretations (Chandler & Lalonde, 1996; Carpendale & Chandler, 1996). Carpendale & Chandler (1996) argued that “interpretation is a thing needing to be done...in response to ambiguities brought on by a shortage of relevant information” (p.1693). In this light, children are said to possess an interpretive theory of mind only when they are able to appreciate the true nature of a potentially ambiguous situation. That is, that such events are “open” to more than one belief or mental state – You see a dog, while I see a flower. Passing a standard false belief task is no guarantee of success in such situations. Appreciating the differences of interpretation that can be provoked by ambiguous stimuli (e.g., ambiguous sentences, communication, pictures), would seem to demand a different set of skills. Not until the age of seven or eight, are children consistently able to recognize that contrasting interpretations might be the result of an ambiguous situation (Carpendale & Chandler, 1996; Lalonde & Chandler, 1995). These findings are consistent with those of other researchers who have described the relative difficulty of children younger than eight years in completing other tasks of interpretation including referential communication (Bonitatibus, 1988), and irony (Winner & Leekam, 1991).

Turning now to a discussion of emotional understanding, one's attention might be drawn to the remarkable similarities in the conceptual development of emotions to the understanding of mental states. Re-emerging themes include the developing awareness that emotions can be false, that they can be engineered, and that emotional responses to certain events can be "open" to interpretation, particularly when differences in background and personal traits exist.

Strategic control of emotions: Using display rules

Theory of mind theorists have argued that success on false belief and deception tasks reflects an understanding that beliefs need not always accord with reality. In a similar vein, a growing number of investigators have examined the use of *display rules* as a means to infer whether or not children understand that expressed emotions are not always the same as experienced emotions (Zeman & Garber, 1996; Gnepp & Hess, 1986; Meerum Terwogt & Olthof, 1989; Saarni, 1989; Harris, Donnelly, Guz & Pitt-Watson, 1986; McCoy & Masters, 1985). A display rule has been defined as "a principle guiding when and how people regulate their emotional expressions" (Gnepp & Hess, 1986).

Studies of children's understanding of display rules have included observational studies of children attempting to hide their emotions in disappointing situations (Saarni, 1984), as well as children's self reports concerning the actions they would take in order to hide their emotions in different situations (Zeman & Garber, 1996; Harris et al., 1986; Gnepp & Hess, 1986; McCoy & Masters, 1985). Display rules have been classified in many ways, including the distinction between emotions that are modulated for self-protection (e.g., to avoid embarrassment) versus those motivated by prosocial reasons

(e.g., to avoid hurting someone else's feelings; Gnepp & Hess, 1986). Gnepp & Hess (1986) found that children's understanding of display rules increased steadily between grades one through five, and that children were more likely to express display rules in situations of prosocial than self-protective motivation. The authors also reported that children's understanding of verbal display rules (i.e., *saying* something to hide your feelings) was better than their understanding of facial display rules (i.e., changing your outward expression to hide your feelings). Other studies have generally supported the finding that school-aged children develop an awareness of different ways to control overt emotional expressions. Harris, Olthof & Terwogt (1981) found that approximately half of the children at ages six, eleven and fifteen indicated that it was possible to display a substitute emotion. As a means to doing this, they cited changes in facial, verbal or behavioral expressions.

Other factors influencing children's use of display rules to hide their true emotions include gender, age, and the type of audience (Zeman & Garber, 1996). Zeman & Garber (1996) reported that girls and younger children were more likely to report a true feeling of sadness than attempt to cover it up. Also, children were more likely to report a desire to control their emotional expression in the presence of peers compared to their parents.

Taken together, these findings suggest that school-aged children develop a greater awareness that expressed emotions are not always the same as experienced emotions. By acknowledging and demonstrating the use of display rules to hide a true emotional expression, children appear to recognize that emotions, like beliefs, can be intentionally

falsified, and that another person's perception of one's emotional state can be controlled by intentionally deceptive means (i.e. display rules).

Recognizing multiple emotions

Much of the research into children's ability to understand the interpretive nature of emotional states has focused on the recognition that multiple emotions can be elicited by a single event or situation. Surprisingly, the developmental progression reported in the research is quite consistent. In the pioneering work of Susan Harter, it was first reported that children seen in a clinical setting had great difficulty acknowledging mixed feelings towards a caregiver or relative (Harter, 1977). She subsequently initiated a series of studies to systematically examine children's understanding of simultaneous emotions. During a structured interview, children were asked to nominate situations from their personal lives in which they had experienced basic emotions such as happiness, sadness, fear, and surprise. Children were also asked to identify situations in which they had felt two emotions, either in succession, or at the same time. Her findings revealed that children's acknowledgment of multiple emotions passed through several developmental stages and varied depending on whether the two emotions were of the same valence (positive or negative) and whether they occurred simultaneously or in succession (Harter, 1983; Harter & Whitesell, 1989). Very young children (ages three to six years) could easily describe situations evoking single emotions, but they were unable to conceive of a situation in which two emotions were felt either in succession or at the same time. Between six and eight years of age, children began to acknowledge that two emotions could be elicited by one situation, but insisted that the emotions would be experienced

one after the other. By about seven to eight years of age, children started to report situations in which two emotions could be experienced simultaneously, but tended only to describe situations that would evoke two emotions of the same valence (e.g., happy and excited). Harter & Whitesell (1989) reported that at around ten years of age, children “demonstrated a major conceptual advance” in that they were able to appreciate simultaneous *opposite* valence emotions (p.85). However, children described each emotion as occurring towards a different event or aspect of the situation. The negative emotion was directed at a negative event (e.g., “I was scared about taking the bus to school”) while a positive emotion was directed toward a different, positive aspect of the situation (“but at the same time, I was really happy when I saw my friend waiting at the bus stop). It was not until eleven to twelve years of age, that children were finally able to describe situations in which opposite valence feelings could be brought to bear on a single target (e.g., “I was excited to go to summer camp but also scared because I didn’t know anyone there”).

The findings of Harter and her colleagues have been replicated and extended by others to show that the same developmental trends occur when children are asked to judge multiple emotional responses of characters’ in a story (Meerum Terwogt, 1989; Harris, 1983) or when they are asked to report multiple feelings they might have in response to a given situation (Gallander, Wintre & Vallance, 1994). Meerum Terwogt (1989) found that children with emotional and behavioural disorders between the ages of six and eleven years progressed in a similar fashion; however, they were more likely to deny all emotions in a situation, and to rate the emotions in a situation as more intense than other children.

Once again, similarities in the development of emotional understanding and mental state awareness can be noted. In the school-aged years, while children are developing a greater understanding of the interpretive nature of thoughts and beliefs, they appear also to recognize interpretive qualities of feelings. They come to appreciate that multiple feeling states, like mental states, can be in conflict with each other without being incorrect or illogical.

Personalized Inferences in Cognition and Emotion

The notion of *interpretive diversity* – the ability to recognize that individual differences in background knowledge, experience, or expertise can contribute to an individual's beliefs and/or emotions in given situation – follows closely from the development of an interpretive theory of mind. In developing an interpretive theory of mind, children are said to come to understand that knowledge is constructed by the perceiver rather than simply copied or recorded from perceptual experiences.

Understanding that a person makes a contribution to the way information is perceived, leads to the appreciation that the same information may be interpreted in different ways. A further development in children's understanding is the appreciation that background knowledge, personal traits, or any number individual differences can contribute to a diverse number of interpretations among participants in the same situation.

Studies have shown that young children who pass standard false belief tasks are not always able to recognize that individual differences in background knowledge can result in different interpretations. In particular, researchers have examined children's ability to use personal information about a character's age (baby vs. adult) in making

judgments about the character's knowledge in different situations (Montgomery, 1993; Taylor, Cartwright & Bowden, 1991). Montgomery (1993) found that children between the ages of six and nine years tend to overestimate a baby's ability to benefit from verbal communication regarding the location of a hidden object. Such children tended to report that, like adults, babies could learn about the location of a hidden object if they were given verbal information about where it was. Only 33% of eight-to-nine year olds were able to understand: (1) that ambiguous statements do not convey information about an object's location, and (2) that a baby's lack of language skill would preclude the understanding of any statement, ambiguous or otherwise, about an object's location. This was a striking finding, given that, on direct questioning, children of this age demonstrate a good appreciation of a baby's cognitive limitations (Montgomery, 1993; Taylor et al., 1991).

Similarly, a study by Gnepp & Gould (1985) examined adult's and children's ability to use information about an individual's prior experiences to predict that person's *emotional* response in a particular situation. The authors defined a "personalized response" as one in which the subject took into account prior information to personalize the prediction of an emotion experienced in a given scenario. In contrast, a "situational response" was designated when a subject ignored prior information and predicted an emotional response solely based on current situational information. Subjects heard a story describing a character who is involved two separate events occurring one after another. The events were presented in temporal order, such that one might reasonably expect the first event to influence the character's feelings towards the second event. According to the concepts of *personalized* and *situational* responses described by Gnepp

& Gould (1985), a personalized response about the character's emotional reaction to the second event would take into account the influence of the first event. On the other hand, a situational response would ignore the influence of the first event, and focus entirely on the second.

Children's ability to spontaneously determine the relevance of previous events and apply this knowledge in making judgments developed steadily between first grade and college years. Only college students made reliable and consistent use of this information, while fifth grade students failed to make *personalized responses* about one-third of the time.

Taken together, the above-mentioned research suggests that, indeed, more sophisticated and socially valuable skills continue to develop throughout the school-aged years. Children's acknowledgment of multiple simultaneous emotional states, the emergence of an interpretative theory of mind, and the recognition that personal and environmental factors can influence mental and emotional states, all represent significant advances from what children are presumed to understand at the end of their fifth year. As one can see, many researchers have chosen to focus on either cognitive or emotional aspects of social competence, leaving only theoretical discussions of the relationship among these skills rather than empirical investigations.

The relationship between cognitive and affective development

The similarities in the patterns of development and the specific areas of knowledge that are acquired during middle childhood beg the question: Are these aspects

of cognitive development and affective development independent, or are they related in some way? Although this relationship is not often considered by investigators of social cognition, a number of theories have considered the role of cognitive functioning in the development of emotional systems and emotional understanding. Five major theoretical perspectives on emotional development are briefly presented below, focusing on each perspective's standpoint on the role of cognition in emotional functioning.

Biological Perspectives and Differential Emotions Theory

From the biological perspective, emotions are defined as innate, neuromuscular processes that remain stable throughout development. A given number of "basic" emotions are taken to exist as intrinsically discrete systems that are distinct from cognitive and other psychological processes. Despite a strong belief in the inherent modularity of emotional systems, proponents of this view (e.g., Ekman, Izard, Tomkins, Ackerman), maintain that, through maturation and socialization, emotions interact and become interconnected with cognitive and behavioural systems in order to serve adaptive functions. Supporters of Differential Emotions Theory (a biologically-based approach) distinguish between "independent" and "dependent" emotions. In considering the "basic" emotions, such theorists submit that the "sensation" or feeling component of these independent emotions is a reflexive response that is invariant over the lifespan (Ackerman, Abe & Izard, 1998). On the other hand, the development of dependent emotions relies on the affective-cognitive relationship and cannot occur without: (1) a sense of self, (2) the ability to discriminate the self from others, (3) the ability to sense the self and others as causal agents, and (4) some cognitive evaluative process enabling at

least rudimentary forms of comparison and judgment (Ackerman et al., 1998). In this way, dependent emotions are seen as fundamentally different from independent emotions because they are built on crucial interconnections of cognitive and affective systems during development. Emotional-cognitive interactions do not change emotional feeling states, rather, they connect feelings with changing images and thoughts. Changes in emotional development are considered to mainly reflect increases in communication between systems and the construction of control mechanisms for monitoring and regulating cognitions and/or emotions (Ackerman et al., 1998). Based on these assumptions, supporters of the biological perspective have suggested that maladaptive behaviour may reflect dysfunctional cognitive-affective connections or disconnections due to maturational and/or socialization difficulties.

Cognitive Perspectives

Although cognitive theory does not deny the role of biology in human functioning, proponents of this perspective emphasize the cognitive foundations of emotions. In this approach, emotions are not treated as distinct systems, rather they are conceptualized as a function of cognition. Kagan (1984) describes emotions as representing the relationship among: (1) external incentives, (2) thoughts, and (3) detected changes in internal feeling states. These three factors combine to form a relationship to which individuals then assign a label – an “emotion”. For example, seeing a strange dog, a child might expect physical harm, and perceive an increase in his/her heart rate. The relationship among these three variables becomes encoded as “fear”.

It follows, then, that emotional development occurs as a function of cognitive development. As new cognitive abilities are acquired (e.g., understanding the concept of self), the types of incentives that contribute to emotional states shift from external to internal. This allows individuals to begin to experience new types of emotions that would not otherwise have been possible (e.g., pride). Thus, according to this perspective, cognition and emotion are not merely related in development – emotional awareness is a product of cognitive functioning.

Structural-Developmental Perspectives (a.k.a. “social-constructivist” approach)

Models from the structural-developmental perspective have been proposed by Lewis (Lewis, Sullivan & Michalson, 1984), Sroufe (1996), Fischer (Fischer, Shaver & Carnochan, 1990), and Case (Case, Hayward, Lewis & Hurst, 1988). According to Sroufe’s (1996) approach, development is defined in terms of “directionality” and “structural transformation”. Psychological processes are defined in terms of the organization of their elements which undergo changes in development toward increased differentiation and integration (Griffin & Mascolo, 1998). Therefore, according to this view, psychological processes do not emerge at given periods in development, as all behaviour is seen as moving in continuous change from simple to more complex forms. Sroufe’s (1996) model is based on the notion that emotional development is linked to changes in neurophysiological, cognitive and social development, whereby “emotions” are defined as “a subjective reaction to a salient event, characterized by physiological, experiential and overt behavioural changes,” (p.15). Three innate and independent affective systems form the basis of Sroufe’s theory. Similar to the biological theories,

each of Sroufe's systems (joy, anger and fear) is discrete. However, while biological theories suggest that the basic emotions remain invariant across the lifespan, the structural-developmental perspective maintains that each of these emotions becomes increasingly complex through a series of stage-like transitions. At any given point in development, emotional functioning is defined by the organization among affect, cognition, physiological responsiveness and behaviour within a social context (Griffin & Mascolo, 1998). Certainly, then, changes in any of the underlying elements that comprise emotional functioning (e.g., cognition) could influence the overall quality of the psychological process as a whole.

Functionalist Approaches

Proponents of the functionalist perspective (e.g., Barrett) do not view emotions as subjective or objective entities existing in the brain or in behaviour. Emotional functioning is treated as a process of reciprocal interaction between the individual and the environment, as "appreciated" by the individual (Barrett, 1998). Although emotions may be associated with particular feeling states, thoughts, and/or behaviours, each of these represents only one element of the emotion process. Emotions are not innate, but evolve from an individual's involvement with the environment and are classified by "families" according to the function that they serve. Emotion "families" are defined by the three adaptive functions they promote: a behaviour-regulatory function, a social-regulatory (interpersonal communication) function, and an internal-regulatory (intrapersonal) function. For example, the behaviour-regulatory function of "joy" is to continue ongoing activities; the social-regulatory function is to communicate to others that ongoing activities are enjoyable; the internal-regulatory function serves to expand available

positive or creative thoughts or to motivate oneself to continue successful activities (Barrett, 1998). Thus, according to this view, emotions are defined in terms of what potential behaviours may do for the individual in their ongoing interaction with the environment.

According to the functionalist perspective, emotional development is not restricted to cognitive or structural changes, but may include any changes that affect the emotion process. Although the three adaptive functions that define an emotion “family” do not change with development, the ability to control emotional responses should increase with age. Similarly, enhanced ability to “use” emotional responses to serve additional functions should develop (e.g., using a happy voice to get oneself promoted in her job). With development, the number of situations that elicit emotion and the number of potential emotional responses increase considerably as children become more socialized (Barrett, 1998). In this way, changes in emotion may occur as a function of cognitive development (among other things) – as the individual becomes cognitively able to appreciate new and increasingly complex relationships with the environment.

Sociocultural Perspectives

Finally, sociocultural approaches bring to the discussion an increased sensitivity to the social or cultural contributions to the development of emotions. Emotions are not seen as discrete entities, but rather as a relationship among neural firing, experiences and expression as they are organized over time within social contexts. From this perspective, emotions are considered “socially constructed syndromes” that reflect larger social influences, as the social context exerts a direct influence on the formation of any emotional reaction (Averill, 1982). Although these theorists do not deny the role of

biology in emotion formation, they emphasize the influence of socially-based attitudes, beliefs and judgments in defining emotions, rather than focusing on innate feeling states (Griffin & Mascolo, 1998).

Each in its own way, these theories discuss a possible relationship between emotional and cognitive functioning through development. In the most extreme, cognitive theorists maintain that emotions are essentially cognitive interpretations of bodily states in a given context. Other theories (e.g., biological, structural-developmental) define emotions as independent entities that have a significant relationship and reciprocal influence on cognitive functioning throughout the lifespan. Finally, functionalist models do not treat emotions as an entity at all, but as an ongoing process of interaction with one's environment, which can be naturally influenced by one's level of cognitive functioning among other variables. In their own way, each perspective provides a backdrop against which to frame children's performance on measures of social competence. If one predicts a relationship between cognitive and emotional development, then it would not be surprising to observe relationships among tasks, and consistencies in level of performance across the two domains. Also, these theories provide ways of understanding the possible causes of impairment in social competence. According to theories that support cognitive-affective interaction in development, impairments in neurological and/or cognitive development would clearly influence emotional understanding in some way – either directly (e.g., cognitive or biological theories), or indirectly by influencing the types of interactions an individual has in her/his environment (e.g., structural-developmental or functionalist theories).

From the sociocultural perspective we are reminded of the importance of socialization experiences in skill development and application. The conceptualization of “social competence” presented earlier draws on ideas from many of these theories, suggesting important roles for biology, socialization processes, social context, and individual differences in the development of self-efficacy in social transactions.

Impairments in social competence: What we know so far

Researchers have characterized and documented “social disability” in many psychological and neurological disorders. Although investigations into children’s developing understanding of beliefs and emotions have traditionally focused on healthy children, an increasing number of studies of children with apparent deficits are now available.

Within the theory of mind literature, there are many reports suggesting that individuals with pervasive developmental disorders (including autism and Asperger’s syndrome) have considerable difficulty on theory of mind tasks relative to their non-autistic age peers (e.g., Leekam & Perner, 1991; Happé, 1993). While some higher-functioning individuals with autism have been able to successfully complete first-order false belief tasks, they are often unable to succeed at so-called second-order tasks, in particular, those involving metaphor, simile and irony (Happé, 1993). The findings in this area have been so numerous, that some have proposed that failure to develop mental state understanding is the principal deficit in autism (see Rogers & Pennington, 1991 for a discussion), and research has begun to explore underlying brain mechanisms that might explain this impaired performance (Rogers & Pennington, 1991; Brothers, 1990).

In adults, the relationship between theory of mind and right hemisphere dysfunction has been supported by several studies (Siegal, Carrington & Radel, 1996; Winner, Brownell, Happé, Blum & Pincus, 1998). Other studies have reported a significant relationship between theory of mind and performance on measures of executive function (McEvoy, Rogers, & Pennington, 1993; Ozonoff, Pennington & Rogers, 1991). A relationship to frontal lobe functioning has also been demonstrated by a number of neuroimaging studies (e.g., Baron-Cohen, Ring, Moriarty, Schmitz, Costa & Ell, 1994).

Although other literature specifically examining theory of mind task performance among children with various disabilities is minimal, difficulties in everyday behaviours such as making conversation, reading emotional and social cues, and controlling emotional expression have been reported for individuals with attention deficit disorder (Matthys, Cuperus & van Engeland, 1999; Milich-Reich, Campbell, Pelham, Connelly & Geva, 1999; Greene, Biederman, Faraone, Ouellette, Penn & Griffin, 1996), learning disabilities (Sprouse, Hall, Raymond, Webster & Bolen, 1998; Rourke & Tsatsanis, 1996), mental retardation (Moffatt, Hanley-Maxwell & Donnellan, 1995; Adams & Markman, 1991), and head injury (Dennis, Barnes, Wilkinson & Humphreys, 1998; Petterson, 1991; Jackson & Moffatt, 1987). Clinical experience suggests that referrals for neuropsychological assessment of cognitive impairments often reveal additional concerns regarding a child's general ability to interact socially.

While the findings of these studies certainly add to our knowledge of social competence in children with various disabilities, there are some limitations from the standpoint of clinical utility. First, each study has been conducted independently by

separate researchers, using different methodologies. Because of this, it is difficult to relate the nature and extent of social impairments across clinical groups. Is the type of difficulty experienced by one group (e.g., ADHD) qualitatively and/or quantitatively different from another group (e.g., nonverbal learning disability)? Are all researchers describing the same impairment when they make reference to “social disability” or the plethora of other commonly used terms?

Second, although the tasks employed by experimental designs are appropriate for group comparison, there are not always appropriate for clinical use. For the most part, experimental designs demonstrate statistical differences by comparing the performance of a clinical and non-clinical group on the same measure. Notwithstanding the fact that statistical significance does not always equate with clinical impairment, the results derived from an experimental format provide little information about the degree of impairment of an individual child relative to his/her peers. These studies are designed to look at overall group differences without providing interpretation at the individual level. In many studies, individual subject performance on measures of social competence is highly variable.

Finally, many of the protocols are lengthy, use dichotomous (pass-fail) rather than continuous scoring systems, or are appropriate for use with only a limited age group (e.g., only 3-year olds). Too many clinical psychologists are all but unaware of these paradigms or even the research in social competence. This may be related to the limited clinical utility of the tasks, as well as an overall lack of collaboration between the clinical and experimental fields.

Summary and Goals of the Study

Interaction in a social world requires more than good conversational skills and social graces. In fact, the task of unraveling the complexities involved in social interaction has been taken up by a diverse body of researchers including those in the fields of occupational therapy, social and developmental psychology, education and speech-language pathology. These various efforts have produced a bumper crop of conceptual terms, such as *theory of mind*, *discourse processing*, *referential communication*, and *social referencing*, all meant to capture some important nuance of the essential components of social interaction.

In psychology, researchers have concentrated their attention on skills such as cognitive perspective-taking, recognizing and expressing emotions, and the understanding of subtle uses of language to chart developmental changes in social interaction abilities. For each these skills, pockets of research have documented developmental progressions within typical populations of children and, in some cases, more limited information on development within atypical populations (e.g., those with learning disabilities, autism, attention deficit disorder). These latter investigations have pointed toward common and systematic impairments that may exist in these areas across these different groups. Despite this progress, the ability to evaluate social interaction abilities in a clinical setting remains limited. From a clinical perspective, the extant empirical studies are scattered: Most use experimental, non-normative tasks that are unique to each study and subject population, and few can be easily adapted for single subject assessment or clinical interpretation and integration.

This lack of applicability is particularly troubling given that experience from clinical practice suggests that problems in social cognition (both subtle and severe) may exist in a wide range of children presenting for assessment and treatment. There are currently no available measures that are both broad enough in scope and yet detailed enough in content to provide data for normative comparison for the assessment of such children. Although some more specific tests have recently been introduced (e.g., Muris, Steerneman, Meesters, Merckelbach, Horselenberg, van den Hogen & van Dongen, 1999 [The TOM Test]; Magill-Evans, Koning, Cameron-Sadava & Manyk, 1995 [CASP]), these measures tend to focus on circumscribed aspects of social interaction such as recognizing emotional states from visual cues (CASP) or making judgments and predictions based on the mental states of others (TOM Test). Among school-aged children, whose difficulties in social interaction range much farther afield and typically include generalized impairments in peer relations, school work and family life, these single focus tools are of little real help. The lack of a broad-based measure of the range of skills required for engaging in successful social interaction also hampers the clinician's ability to understand a particular child's skills in relation to other areas of strength and weakness in that child's profile. Thus, while there is general agreement between both clinical and developmental psychologists about the importance social interaction skills in typical and atypical development, little attention has been devoted to the construction of an assessment tool that includes more than one or two of the skills that are known to influence social interactions in children.

This study represented an attempt to move closer toward such a tool. In order to begin to develop a measure that would be suitable for evaluating social interaction skills

in school-aged children, and with an eye toward eventual clinical utility, there were several important factors to consider. These could be considered the more “methodological” issues of this study. The measure should:

1. *Be able to assess a broad range of skills and abilities known to be important to social interaction.* The selection of modalities should be representative (since it cannot be exhaustive) of the kinds of research findings available for a designated age group. One could begin by selecting domains based on available research methods that have demonstrated variability in the performance of typical subjects across the years of middle childhood.
2. *Provide normative data across a wide range of ages.* This can be achieved by using a large normative sample to preclude floor or ceiling effects on the various tasks.
3. *Be appropriate for clinical use and interpretation.* Pass/fail scoring criteria, in addition to constraining variability, do not ordinarily provide an adequate means of assessing ongoing development and diminish opportunities for detailed comparisons among same-aged peers.
4. *Have a relatively short administration time.* Since it is expected that such a measure might be given in the context of a larger neuropsychological test battery, pragmatic issues such as cost-effectiveness (in terms of time to administer the test) and the ability to maintain a child’s interest are important considerations.
5. *Demonstrate ecological validity and relevance to everyday behaviour and clinical practice.* Clinical referrals are most often initiated on the basis of some difficulty that a child is having in their daily living. Although an individual, standardized task may not directly evaluate everyday behaviour, it is crucial that performance on the

measure have some demonstrable and understandable relation to everyday functioning. One approach to establishing the ecological validity of a new measure would be to compare task performance with parent reports of everyday behaviours that develop during the middle school years, and also to particular social behaviours that have been reported in research to be impaired in various clinical populations.

The foregoing list was not meant to be exhaustive of the desired features of such a measure, but rather as a set of guidelines or criteria against which the proposed research should be judged.

With an eye toward more “conceptual” issues, this study also aimed to explore the ongoing development of a number of social interaction skills throughout the middle childhood years. Conceptually, the majority of these skills have been treated as independent of one another, and relationships between the developmental histories of these abilities have not been systematically explored. Moreover, the methods and tasks on which claims about the development of these abilities are made have been somewhat idiosyncratic. From the remarkable similarities in the development of emotional and mental state understanding, it makes one wonder whether their treatment as independent constructs is justified. One might suspect that these skills are not only related by the fact that they emerge at similar points in childhood development, but that their emergence reflects an overall shift in a child’s conceptual ability that is essential to developing more sophisticated, adult-level, social interaction skills.

For all of these reasons, this study examined the developmental trajectories of several of these skills, in order to understand the relationships among them in typically developing children. By selecting tasks in six of these key content areas - (1) false belief, (2) interpretive theory of mind, (3) display rules, (4) understanding multiple emotions, and making personalized inferences about (5) thoughts, and (6) emotions, this study was intended, not only to investigate the interrelationships among tasks, but to provide a preliminary base of normative information against which atypical development may be understood in future studies. In order to appreciate the relationship between task performance and everyday behaviour, parent and teacher reports were included in the protocol. This was intended not only to provide ecological validity to the development of this standardized measure, but also to provide an additional resource for clinicians in gathering data from parents, teachers and other individuals who interact with the children who are referred for assessment.

Methods

Subjects

Eighty-nine children between the ages of six and twelve years participated in the study. Descriptive statistics for the sample are provided in Table 1. Subjects were recruited through two public schools in the York Region Board of Education (a suburb of Toronto). Some brief demographics for the population of this area are given in Appendix A. Children were invited to participate by way of a letter sent home to parents. Exclusionary criteria included reported learning and/or attentional difficulties, or history

of significant head injury. Note: Children who volunteered to participate but met the exclusionary criteria were not refused, although their data was not included in the general analyses.

Table 1. Descriptive Statistics for the Sample

Age Group	N	Gender		Handedness		Vocabulary SS ¹	
		M	F	R	L	Mean (SD)	Range
6-year olds	12	5	7	11	1	11.3 (2.1)	8 - 15
7-year olds	14	7	7	14	0	11.9 (1.9)	9 - 16
8-year olds	10	4	6	8	2	11.5 (1.9)	10 - 15
9-year olds	17	10	7	15	2	12.4 (1.5)	10 - 16
10-year olds	14	3	11	10	4	10.6 (2.1)	7 - 14
11-year olds	11	4	7	10	1	12.0 (1.5)	9 - 15
12-year olds	11	5	6	11	0	11.3 (1.8)	8 - 14
Total	89	38	51	79	10	11.6 (1.9)	7 - 16

¹ Wechsler Intelligence Scale for Children (Third Edition) – Vocabulary Subtest

Measures

Screening Measures

All subjects received the Vocabulary subtest of the Wechsler Intelligence Scale for Children, Third edition (Wechsler, 1991). Scores on this measure were used to confirm that all subjects fell broadly within the average range of intellectual functioning (i.e., within 1 standard deviation). None of the participants tested scored below the average range, and therefore it was not necessary to exclude anyone from the study on these grounds.

Development of the measures

Each of the measures developed for this study was based on tasks and procedures described in previous studies. In selecting appropriate tasks, important considerations included whether the same measure could be used across the entire age span (6 to 12 years old), how it was scored (i.e., not pass/fail), and how long the task took to administer. Although the tasks in this study were based on methods reported in previous research, all of the stories used here were created for this study. In order to ensure that the language used in the stories did not exceed the level of comprehension that could be expected from our youngest participants, each story was analyzed for reading level using the option available within Microsoft Word® word processing software. Stories were modified such that no story had a reading level exceeding the third grade, and each group of stories were reasonably similar to each other in terms of the level required. Given that the grade estimate was based on reading ability, and that all of the stories were to be read aloud by the examiner, we were confident that all of the participants would be able to comprehend the language used.

False belief, intentional deception and sarcasm

Administration. This section included a total of 8 short stories: 2 first-order false belief, 2 second-order false belief, 2 intentional deception, and 2 sarcasm.

Subjects began with the second-order false belief tasks. Since the first-order false belief tasks are typically passed by children between the ages of three to five years, only those children who did not pass the second-order task were given the first-order false

belief task. All evidence from the research suggests that children who can pass a second-order task can also succeed at the first-order version. Therefore, children who successfully passed the second-order task were automatically given credit for the first-order task, and continued on to the intentional deception and sarcasm stories.

At the outset of the task, all participants were given the following instructions:

I will ask you to look at pictures and listen to some stories. If you don't understand the question or you forget what I asked, tell me and I will say it again. If any of the tasks make you uncomfortable, you don't have to do them. Let me know, and we can stop at any time. Okay, are we ready to start?

Each false belief story was then read aloud to the participant, accompanied by a picture depicting the main characters and the scene of the story. An example of a second-order false belief story is presented below (sample stories appear in Appendix B).

A man wearing a ski mask robs a bank downtown. He escapes from the bank without being seen. He hides the money in a briefcase and quickly takes off the mask and throws it in a garbage can. As he is getting ready to drive away, a policeman comes up to the car and knocks on the window. The policeman says, "Wait a minute." The man gets out of the car and starts running down the street. The policeman looks confused. He just wanted to tell the man that he had a flat tire!

Memory Question: Did the policeman see the man rob the bank?

Prediction Question: What did the man think the policeman was going to do?

Explanation Question: Why did he think that?

After hearing each false belief story, participants were asked a *memory* question regarding one piece of factual information from the story, in order to confirm that they have understood it correctly. For participants who answered this question incorrectly, the story was reread, until they provided the correct response. Participants were then

required to demonstrate an understanding of a character's false belief by *predicting* an action that the character would take (first-order) or by articulating the belief that the character had about another character's thoughts (second-order). Finally, participants were asked to *explain* their prediction.

Regardless of their performance on the false belief tasks, all participants continued directly to the intentional deception and sarcasm stories. These four stories were modeled on the Demorest et al. (1984) task involving the detection of intentional lying and sarcasm. Each story consisted of a short paragraph including a description of the facts of the situation, a description of the gestures and other nonverbal behaviours of the speaker, and a final remark made from one character (speaker) to the other character (listener). Once again, the stories were read aloud and accompanied by a picture of the scene. An example of a story involving intentional deception is presented below.

At school, Allison's class is learning how to draw animals. Allison likes to draw. She works very hard on her drawing of a cat. When Allison is finished, her drawing looks more like a rabbit than a cat. The ears are very long, and it has a bushy tail. Allison takes the drawing home to show her father. She carries it very carefully so that it will not get bent. Allison's father looks at the drawing. He thinks it is a picture of a rabbit. Allison says, "It is a picture of cat." Her father nods and says, "I can see that. I think it's the best drawing of a cat that I've ever seen."

Memory Question: What happened in the story?

Question 1: Did Allison's father think the drawing was the best one he had ever seen?

Question 2: How do you know he thought that?

Question 3: Did Allison's father want her to think it was the best one he'd ever seen or not?

Question 4: How do you know he wanted her to think that?

Following the story, participants were asked a *memory* question to determine their understanding of the facts of the story. As before, participants who answered incorrectly

were reread the story until they answered the memory question correctly. Participants were then asked four questions to determine whether they had interpreted the story as an episode of deceit or sarcasm. Question 1 was used to determine the participants' knowledge of the character's true belief. Question 2 determined the participants' explanation of why the character held that belief. Question 3 was used to ascertain the participants' understanding of the speaker's purpose in making the statement in the story. In Question 4 participants were asked to provide evidence for their response to Question 3.

Scoring. For the false belief stories, participants were given one point for each *prediction* question correctly answered (possible total of 4 points). In the case of the first-order stories, the prediction question was judged incorrect if the participant indicated that the character acted based on information or an event that took place while the character was not present (e.g., he looked in the right place even though he didn't see it moved there). A response was also judged to be incorrect if the participant gave the correct response for the prediction question but was unable to explain why the character would act in that way. A correct response would be one in which the participant correctly identified the character's action, and provided a reasonable explanation as to why the character would do so. In the case of the second-order stories, the prediction question was judged correct if the participant identified one character's false belief about another character's thoughts (e.g., the robber thought the police knew he stole the money), and provided a reasonable explanation for why the character held that mistaken belief.

A participant's response to each intentional deception and sarcasm story was judged by collating responses to the memory question and Questions 1 and 3, as suggested by Demorest et al. (1984). A response was interpreted as "deceptive" if:

- The participant indicated in the memory question that the facts did not accord with the final remark made by the character.
- In Question 1 the participant indicated that the speaker did not believe the remark that was made.
- In Question 3 the participant indicated that the speaker wanted the other character to believe the statement.

A response was interpreted as "sarcastic" if:

- The participant indicated in the memory question that the facts did not accord with the remark that was made.
- In question 1 the participant indicated that the speaker did not believe the remark that was made.
- In question 3 the participant indicated that the speaker did not want the other character to believe the statement.

One point for each correct judgment (deceptive or sarcastic) was given (total 4 points).

Interpretive theory of mind

Administration. Participants were introduced to the two puppets, Maxi and Mary, to begin these three tasks based on the study by Carpendale & Chandler (1996).

Participants always completed the tasks in the following order: referential ambiguity,

lexical ambiguity, pictorial ambiguity. No order effects have been reported for these tasks.

In the referential ambiguity task, three cards were arranged on the table in front of the participant as shown in Figure 1.

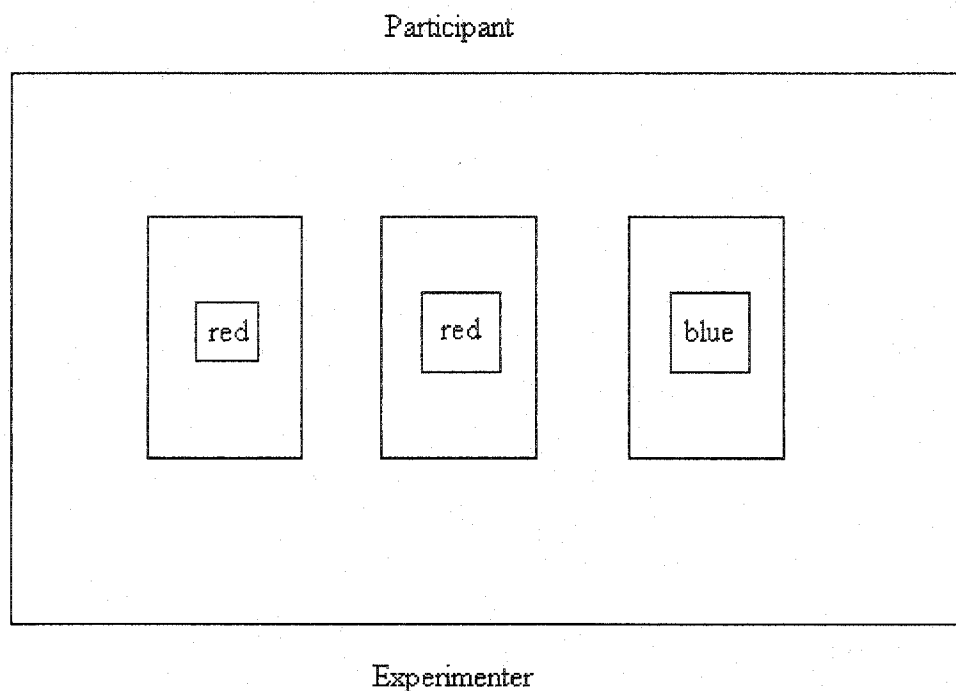


Figure 1. Layout for interpretive theory of mind: referential ambiguity task.

Participants were told that while the two puppets were hiding under the table, a sticker was going to be hidden under one of the cards. Then the puppets would come out and try to find out where the sticker was hiding. The procedure was then carried out as explained and the sticker was placed beneath the card with the big blue block. The puppets were brought out from under the table, and given the clue: *"The sticker is hiding*

under the card with the big block.” With the puppets on her hands, the experimenter pointed “Mary” to the big red block, saying *“I think the sticker is hiding under the card with the big red block.”* Then with “Maxi”, the experimenter pointed and repeated, *“I think it’s hiding under the card with the big blue block.”* The experimenter summarized for the participants by saying, *“Remember, the clue was: ‘it’s under the card with the big block’.”* Then the experimenter asked the child the *explanation* question: *“Is it okay for Mary to say it’s under the card with the big red block, and Maxi to say it’s under the card with the big blue block?”* Then they were asked to give an explanation of why this was, or was not, “OK”. In the *prediction* question, participants were asked, *“If we asked children in another school would they think it’s hiding under the card with the big red block or the big blue block, or wouldn’t you know what they would think?”* If the participant provided a decisive answer about the other child, the experimenter asked: *“How can you tell what they will think?”* or *“How sure are you that they will think that?”* If the subject replied, *“I don’t know”* the experimenter asked: *“Why is it hard to tell what they will think?”* Finally, in the *deviant interpretation* question, participants were told that a third person (Josef) holds an improbable interpretation of where the sticker is hiding (i.e., Josef thinks it is hiding under the card with the small red block). Then they were asked if it makes sense for Josef to say that or not, and why.

Participants continued with the lexical ambiguity task. The experimenter explained that in this task, Mary and Maxi were both told to *“wait here for a pear/pair”*. The participants were then shown a page illustrating both a piece of fruit (pear) and a two socks (pair). Pointing with the Maxi puppet, the experimenter explained that Maxi thinks

he is waiting for a “pear to eat”. But Mary (pointing), thinks she is waiting for a “pair of socks”. The experimenter summarized by saying, “I told them to wait here for a pair/pear.” She then asked the *explanation* question: “Is it okay for Maxi to say he’s waiting for a pear to eat, and Mary to say that she is waiting for a pair of socks? Why/Why not?” This was followed by the *prediction* question (i.e., what will another child think they are waiting for?), and the *deviant interpretation* question (i.e., Josef thinks he’s waiting for an apple, is that okay?).

Finally, in the pictorial ambiguity task, participants were shown an ambiguous line drawing (Jastrow’s “duck-rabbit” drawing, Attneave, 1974; Jastrow, 1900, see Figure 2). As before, the experimenter explained that the two puppets endorse different interpretations of the ambiguous picture – Maxi claims it is a rabbit, but Mary thinks it is a duck. The experimenter then paused to ensure that the participant could see both the duck and rabbit interpretations of the image. Once this was established, she continued with the *explanation* question (i.e., Is it okay? Why/Why not?), the *prediction* question (i.e., What will another child say?), and the *deviant interpretation* question (i.e., Josef says it looks like an elephant, is that okay?).

Scoring. Participants received a score of pass (1 point) or fail (0 points) for each of the questions on each of the tasks (total 9 points). Passing scores were judged according to the following criteria taken from Carpendale & Chandler (1996): For the *explanation question*, participants must have explained that it was possible for the two puppets to hold different interpretations of the stimulus, and understand that the

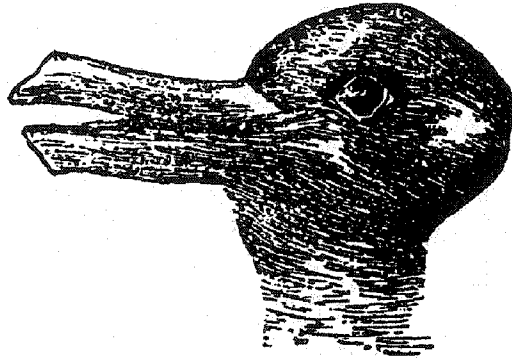


Figure 2. “Duck-rabbit” drawing.

differences in interpretation were due to the ambiguous nature of the picture or message. For example, in reference to the ambiguous picture, one participant responded,

“If you look one way it looks like a rabbit, but the other way it looks like a duck.”

Participants who stated that it was okay for the people to hold two different opinions but could not explain why were scored as failing.

For the *prediction question*, participants were expected to respond that they could not predict what interpretation the other child would make. Participants who made a prediction or stated that they could not predict the response but didn’t know why, were scored as failing. Sometimes, children appeared to be making a concrete prediction because they felt it was more likely that the other children would choose that response. After clarification (i.e., Would they say that for sure?), most children acknowledged that it was possible for some other children to give the other interpretation and these participants were awarded full points.

In response to the *deviant interpretation question*, participants must have stated that the unusual interpretation did not make sense and provide a logical reason for this

(e.g., It doesn't look like an elephant). Participants who endorsed the deviant interpretation or could not explain why it did not make sense were scored as failing. One exception to this guideline was applied in the case of the deviant interpretation question for pictorial ambiguity. On this question, a number of older children responded that it was okay for Josef to say it looked like an elephant, because that was his opinion. These children admitted that *they* could not see how it would look like an elephant, but insisted that Josef might be seeing something that they could not. In this case, full points were awarded as long as children were able to articulate that the interpretation didn't make sense *to them*, but regardless of this, Josef should be entitled to his own opinion.

Strategic control of emotions: Using display rules

Administration. Modeled on the task of Gnepp & Hess (1986), participants were presented with six brief stories about children in situations in which people would typically want to hide their true emotions. Half of the stories will be designed to elicit prosocially motivated display rules (protecting other people by hiding emotions) and the other half motivated by self-protection (to protect oneself from hurt or embarrassment). The following is an example of a prosocially motivated display rule story (sample stories appear in Appendix C).

This is a story about David. Last week, it was David's birthday. David's grandmother came for dinner and gave David his birthday present. She was there when David opened it. It was a hat. David thought it was very ugly.

Participants were instructed that after each story they would be asked to decide what the character in the story would say, and what kind of face s/he would make. At

this time, participants were shown an array of line drawings depicting different emotional expressions (Figure 3).

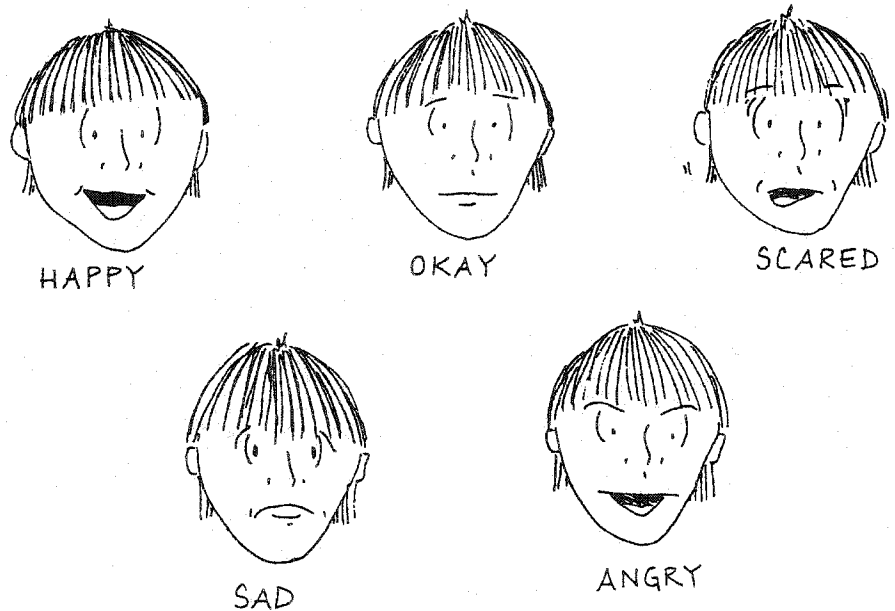


Figure 3. Display rules: Illustrations of facial expressions.

It was explained that, in giving their response, participants could choose any of the faces shown, or suggest a different type of facial expression if they wished.

Scoring. For this task, children's responses were coded as either a "display rule" (1 point) or an "other" type of response (0 points). According to the criterion set out by Gnepp & Hess (1986) a response indicating the use of a "display rule" was one in which the participant explained that the character's expression "did not reflect his or her true feelings, but rather that the protagonist qualified, modulated, or falsified the expression of

emotion for either a prosocial, or self-protective reason (e.g., pretending to like the gift so as not to make his aunt feel bad)” (p.105). All other responses were designated as “other” by exclusion. Participants received a total score reflecting the total percentage of display rules given to the total number of responses (6 stories x 2 responses [one verbal/one nonverbal]= 12 responses). Additional scores were also derived for the percentage of verbal versus facial display rules given.

Recognizing multiple emotions

Administration. Based on a task designed by Meerum Terwogt (1989) participants were presented with four short stories about scenarios in which two different emotions could be elicited simultaneously. Participants were told that they would be hearing some stories “about things that probably never happened to you exactly like this, but they could have”. They were instructed to imagine that these things really did happen to them, and to tell the examiner how they would feel if that was the case. To ensure that the child understood that it was acceptable to give more than one answer, participants were initially given a short trial story as described below.

Imagine you have a pet cat named Felix. One day Felix is playing in the house and he gets his paw caught in the door by accident. You notice that he can't step on his paw anymore. It must be hurt. You take Felix to the doctor. The doctor says that Felix will probably be alright, but he will need to stay in the pet hospital for one night.

Following the story, participants were asked if they would feel sad, afraid, angry or happy. The examiner then repeated the participant's response and introduced the

possibility of other emotional reactions. The following example would represent an examiner's response to a participant who stated that s/he would feel happy.

You told me that you would be happy. Other people told me that they would be sad because the cat got hurt and had to stay in the hospital. Some people might be angry because they think the cat was careless and that's why it got hurt. On the other hand, it is also possible that some people might feel afraid because maybe that doctor is wrong and the cat is not going to be okay. Everything is possible. There are no right or wrong answers. Everybody feels a bit different. I am interested in how *you* would feel. After each story I will ask you whether or not you would be happy, sad, angry or afraid, the way I did before. For each of those four questions I want you to consider how you would feel. If you feel nothing like that or nothing at all, you can say no to every emotion. If you think that you would have more than one feeling, you can say yes to two, three or even all four questions.

Once was established that the child understood these instructions the four test stories were presented (see Appendix D).

Scoring. Although was expected that the majority of participants would give responses corresponding to the emotions intended by the author, unexpected responses were considered equally if they were appropriate. The average number of emotions selected per story was recorded, as well as the number of stories in which the participant cited more than one emotion (possible total of 4). It was the latter score that was expected to be of greater interest, since the literature has shown a developmental progression in children's willingness to acknowledge more than one emotion simultaneously.

Early in the administration of this task it became apparent that differences among the age groups were not emerging. Participants tended to give the same types of

responses to each story, regardless of age. Also, performance on this task did not appear to correspond to performance on other measures. Good performance on other measures did not translate into greater success on this task, nor did poorer performance on other tasks reflect poor performance here. Participants may have had difficulty separating their own true experiences from the scenarios, and this may have influenced their responses. For example, one story described a situation of learning to ski for the first time. Many children explained that they already knew how to ski, and the younger children in particular may not have been able to suppress this experience when formulating their responses. Given the concerns about this task during administration, as well as failure to find significant age differences or correlations with other measures during preliminary analyses, it was decided that this task would be dropped from the battery.

Personalized inferences about others' thoughts

Administration. In this task, taken from Montgomery (1993), participants were presented with three realistic-looking dolls of an infant, a young child, and a mother. A chest of drawers proportionate to the size of the dolls was used to hide a small "poster" or sticker during the task. The chest had four drawers from top to bottom, all painted white except for the drawer second from the top, which was painted black.

Participants were introduced to the three dolls as "the mother and her children." "*Lucy is about 6 years old, and Johnny is about 6 months old. He can't walk or talk yet*". After being introduced to the family, participants were asked to point to the black drawer, the bottom drawer, the white drawers, and the middle drawers. From this, the ambiguity of the white and middle drawers could be noted implicitly by the participant.

After the preliminary screening, participants were told that “while Lucy’s mom and brother were away, Lucy decided to clean the house and put the posters away in the drawers.” Then, the mother and baby were removed from the table and placed out of sight. While holding the Lucy doll, the experimenter opened one of the drawers and inserted a small sticker so the participant could see. Then the drawer was closed. After the poster was hidden, either the mother or the baby was brought back to the table and the participant was asked, “*Did Lucy’s mom/brother see where she put it?*” Lucy was then made to tell the mother/brother doll that “*The poster is in the (x) drawer.*” After this statement, the participant was asked, “*Does Lucy’s mom/brother know which drawer the poster is in now?*”

Participants saw this same procedure repeated six times under varying conditions. For each trial, one of the two dolls (mother or baby) was selected as the listener. The nonlistener doll remained under the table, and the listener doll was brought out and placed in a position facing Lucy in front of the drawers. Each listener doll (either the mother or baby) received three different types of messages:

- (1) ambiguous verbal – mentioning a feature of the drawer common to at least one other drawer (i.e., “the white drawer”, and “the middle drawer”);
- (2) unambiguous verbal – mentioning a distinguishing feature of the drawer where the poster is hidden (i.e., “the black drawer”, and “the bottom drawer”);
- (3) visual message – the listener doll remained in the room while the poster was hidden, and the participant was asked whether the listener doll knew which drawer the poster was in.

As a control measure, at the end of the testing, participants were also asked whether babies “like Johnny” could see and hear.

Scoring. Participants’ responses to the questions about whether babies could see and hear were used only for screening purposes. Demonstrating participants’ ability to correctly answer these questions ensured that failure on any of the trials was not due to a misunderstanding about whether an infant could physically see or hear the required stimuli. The responses to visual messages were also reserved for screening purposes only, as Montgomery (1993) found that a majority (90%) of even preschool-aged children could recognize that seeing led to knowing about the location of the object. Participants who could not pass the visual trials (in this case only 1 child) discontinued the remaining trials and received a score of zero.

In terms of the ambiguous and unambiguous verbal messages, participants received one point for each correct prediction about whether the listener would know where the sticker was hidden. Thus, in this task participants were scored for personalized responses in four conditions:

1. The mother was given an unambiguous instruction.
2. The mother was given an ambiguous instruction.
3. The infant was given an unambiguous instruction.
4. The infant was given an ambiguous instruction.

In order to receive full points for these conditions, participants needed to recognize that the mother (an adult) would be able to benefit from an unambiguous instruction, but not an ambiguous one. They also needed to understand that an infant (only 6 months old) would not benefit from either instruction given his level of understanding of the English language. Thus a possible score of 4 points was assigned based on performance on these four conditions.

Personalized inferences about others' emotions

Administration. Based on the work of Gnepp & Gould (1985) this task consisted of four short stories each describing a primary character who was involved in two separate events: a "first" event and a "second" event depending on their order of occurrence. In each story, the events were presented in temporal order, such that one might reasonably expect the first event to influence the character's feelings towards the second event. For example, in one story, Jesse's aunt is invited for Thanksgiving dinner. Jesse knows that whenever her aunt comes over, her mother serves liver. Jesse hates liver. In the second half of the story, Jesse finds out that her aunt is sick and can't come for dinner. According to the concepts of *personalized* and *situational* responses, a personalized response to the story about Jesse might indicate that she would be happy that her aunt cannot come for dinner because she won't have to eat liver. A situational response might indicate that she would be sad because her aunt is sick (sample stories are provided in Appendix E).

After hearing the story, each participant was asked to predict and explain the character's feelings. If the participant did not suggest an emotional response, s/he was prompted with a follow-up question: *Did Amy feel happy, sad, or scared?*

Scoring. Participants' responses were scored as personalized or not personalized (i.e., all other responses including situational and other responses) according to the coding requirements given by Gnepp & Gould (1985). A participant who acknowledged both personalized and situationally-based emotions, received full points (e.g., she would be disappointed that the aunt couldn't come, but happy that she didn't have to eat liver). The findings of Gnepp & Gould revealed that over 90% of children's responses fell into either the personalized response or situational response categories. For the purpose of data analysis, the percentage of personalized responses to total responses was used.

Note: During the testing, it was noted that, regardless of age, participants were tending not to provide a personalized response to one of the four stories (story #2). After examining the data graphically, it appeared that individuals' performance on story #2 did not reflect their overall performance on the measure (see Figure 4 below). It is suspected that this was due to the content of the story itself. Story #2 outlined a scenario in which a boy wore his new t-shirt to school and his friends laughed and said the shirt looks silly. Later in the day, the boy ripped the t-shirt. Participants were asked to evaluate how he would feel when this happened. Although it was expected that children would respond that the boy might be happy because he wouldn't have to wear the t-shirt anymore, most children said that the boy would be sad because he really liked the t-shirt and it didn't matter what the other kids thought. This was likely a product of some good schooling on

peer pressure. For this reason, the second story was dropped from the final analyses.

Scores on the remaining three stories were used.

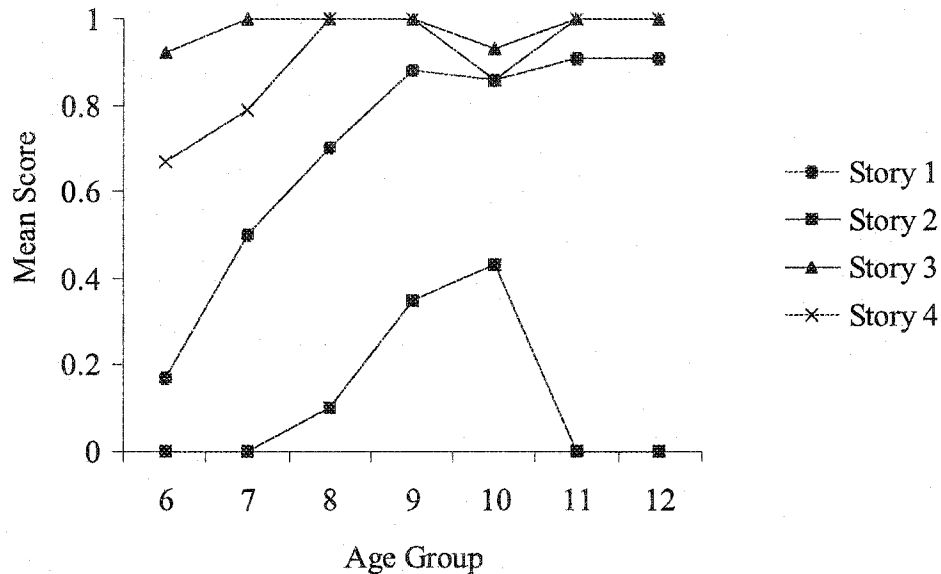


Figure 4. Performance on individual stories of the Personalized Emotions task.

Parent and Teacher Questionnaires

The questionnaires were designed to elicit parent and teacher reports of some everyday behaviours that might reasonably involve an understanding of mental states and emotions. All of the items were originally created by the author and her colleagues.

Their content included social interaction scenarios that would be commonly experienced by a school-aged child (e.g., making friends, being teased, understanding a joke), as well as specific skills or behaviours that have been reported empirically as areas of weakness in certain groups of children (e.g., autism, nonverbal learning disability). Items were sorted into those reflecting mental state understanding (*cognition*), emotional understanding (*emotions*), as well as items that could best be described as social

behaviours (e.g., making eye contact, taking turns). Items were presented in random order in both Questionnaires.

The Parent's Questionnaire consisted of 57 statements which the parents rated on a 4-point Likert-type scale (0 = never, 1 = sometimes, 2 = often, 3 = almost always). The Teacher's Questionnaire represented an abbreviated (33-item) version of the parent's questionnaire, including the items that seemed most applicable to the school environment. Sample items from Parent and Teacher questionnaires have been included in Appendix F.

Four scores were derived for each questionnaire based on different item groupings: (1) a total score, (2) a cognition score, (3) an emotion score, and (4) a behaviour score.

Order of tests

Although a counterbalanced presentation of measures is typically desirable in experimental design, the small number of subjects within each age group made it difficult to adequately control for order effects. Therefore, a fixed order was used both for the presentation of items within a task, and the order in which the tasks were presented. Carpendale and Chandler (1996) specifically addressed the issue of presentation order in their original study, and reported no such effects on the measures of interpretive theory of mind. Throughout the procedure, the normal precautions were taken to ensure that children did not become fatigued or disinterested as the protocol proceeded.

Reliability

All scores requiring judgment of verbal responses were scored independently by two examiners in order to check interrater reliability. Also, in order to examine the test-retest reliability of these measures, a smaller sample of participants was selected to complete the protocol a second time. This sample included two representatives from each age group in the original study ($N = 14$). The number of days between the first and second administration ranged from 18 to 35, with a mean difference of 25 days ($SD = 7$).

Procedure

With permission of the school board and the individual school principals, information packages were sent home to parents of children in grades one through seven. Included in the packages were a consent form, a brief background information sheet, and the Parent Questionnaire. In order for their children to participate in the study, parents returned a signed consent form and a completed copy of the Parent Questionnaire to the school. As an option, parents were invited to complete and return the Parent Questionnaire even if they chose not to have their child participate in the study. Teacher Questionnaires were given to the teachers of children who had received permission to participate in the study.

At the beginning of the protocol, the examiner explained the purpose of the study and the types of tasks to each participant, and each participant signed a form indicating their assent to the procedure. Administration of the protocol (including screening measures) took approximately 30 to 50 minutes depending on the age of the child. Upon

completion of the protocol, participants were thanked for their efforts and each child received a certificate of appreciation for their participation in the study. Small stickers were also used as incentives for cooperation throughout the procedure. All testing was conducted by the author.

Results

The results are presented in several sections reflecting the different questions this study aimed to address. First, each of the measures of social competence are discussed individually in terms of their developmental trends between 6- and 12-years of age, as it was important to create measures that could be used to evaluate social competence across this age range. Normative data for each of these measures by age is provided in Appendix G. Second, the relationship among the cognitive and emotional aspects of social competence is considered. Finally, preliminary psychometric data relating to the measures developed in this study are introduced. This data addresses the issue of content and ecological validity by providing a comparison of objective test performance with subjective behavioural ratings by teachers and parents. Measures of interrater reliability and test-retest reliability are also presented.

False Belief, Intentional Deception and Sarcasm Stories

Scores were converted into percent correct for each type of story. These data were analyzed using a 2(Gender) by 7 (Age) by 3 (Story-type) mixed model ANOVA with Gender and Age as between subjects factors and Story-type as a within subjects

factor. The linear and quadratic effects of age were of particular interest, and were evaluated regardless of the omnibus age effects.

The significant main effect of Gender ($F(1,75) = 5.19, p < .03$) indicated that, on average, girls (mean = 67.31) tended to outperform boys (mean = 58.43). There were also significant main effects of Age ($F(6,75) = 6.05, p < .001$), and Story-type ($F(2,150) = 132.25, p < .001$). The overall age trend was linear ($p < .001$).

At a glance, the graph plotting the three story types by age group suggested some noticeable differences in performance level for each story type (see Figure 5). Further analyses (repeated measures ANOVA for each paired combination of story types) revealed significant differences between the participants' performance on each of the measures. False belief story performance was significantly better than both intentional deception ($F(1,75) = 23.53, p < .001$) and sarcasm ($F(1,75) = 243.59, p < .001$). Performance on the intentional deception stories was significantly higher than performance on stories involving sarcasm ($F(1,75) = 110.31, p < .001$).

Although the omnibus Age by Story-type interaction did not reach conventional levels of statistical significance ($F(12,150) = 1.644, p < .09$), Figure 5 suggests that Story-type might interact with lower-order age trends. Thus, separate analyses focusing on the linear and quadratic age trends for each story type were run.

There was little age-related difference in the performance of participants on the false belief stories. The linear trend by age was marginally significant ($F(1,82) = 3.66, p < .06$). Closer examination of the data revealed near-perfect performance by the 6- and 7-year old participants suggesting a ceiling effect on this aspect of the overall measure.

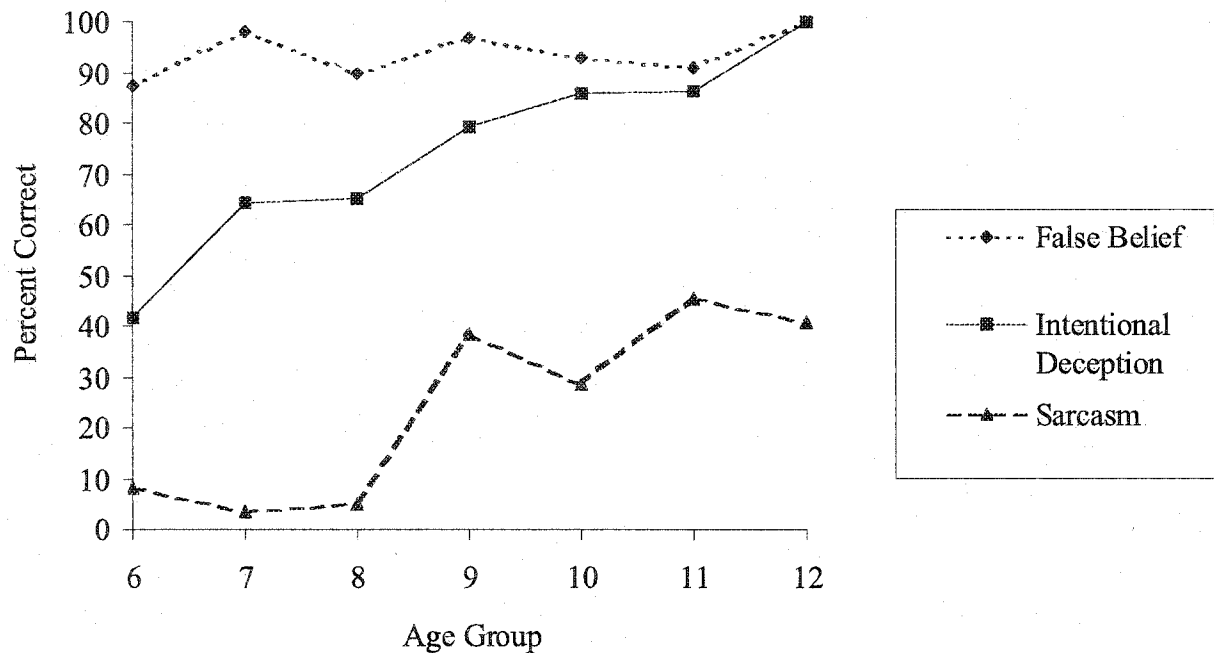


Figure 5. Comparison of three story types by age.

In contrast, a significant linear trend by age was found for performance on the intentional deception stories ($F(1,82) = 24.86, p < .001$). Figure 5 depicts a steady increase in children's performance between the ages of 6- and 12-years of age, culminating in perfect performance by the oldest age group.

The poorest performance of all of the story types was seen on the two sarcasm stories. Again, a significant linear age trend was noted ($F(1,82) = 14.99, p < .001$). The sarcasm stories were rarely passed by children under 9-years of age. This was confirmed statistically. Qualitatively, several distinctions can also be made among the performance of the different age groups. The youngest children (6- to 8-years old) almost always

interpreted the character's sarcastic remark as a literal truth, or they interpreted the character's intention in making the remark as an attempt to "not hurt the other person's feelings". Children between 9- and 11-years of age occasionally received credit for the sarcasm story questions because they recognized that the intention of the character making the sarcastic remark was not to deceive the other character. However, the majority of children who received full points in this age range, tended to explain that the character's remark was meant as a joke, or as an attempt to be "mean". These children, who correctly identified the intention of the character in these stories, rarely described it as "sarcastic". Interestingly, a number of children in this age range (9- to 11-years old) did identify the character's comment as being "sarcastic". However they went on, after further questioning, to say that the character's intention was to "not hurt the other person's feelings", demonstrating that although they were aware of the word "sarcastic" at some level, they did not have a true appreciation of its meaning. Several children in the older age groups (11- and 12-years old) were able to label the speaker's remark as "sarcastic" and demonstrate a full understanding of the speaker's intent. However, this was not the case for the majority of children at any age examined in this study.

Interpretive Theory of Mind

As described above, the scores were converted to percent correct for each type of interpretive task (lexical, pictorial, and referential interpretation). These data were analyzed using a 2 (Gender) by 7 (Age) by 3 (Interpretive task) mixed model ANOVA with Gender and Age as between subjects factors and Interpretive task as a within subjects factor. Again, the linear and quadratic effects of age were of particular interest, and were evaluated regardless of the omnibus age effects. The main effect of Gender was

marginally significant ($F(1,75) = 3.41, p < .07$), suggesting that, on average, girls' performance (mean = 87.34) was somewhat better than boys (mean = 80.75). There were also significant main effects of Age ($F(6,75) = 16.33, p < .001$), and Interpretive task ($F(2,150) = 10.76, p < .001$). The overall age trend was quadratic ($p < .001$). The omnibus interaction between Age and Interpretive task was not significant.

Figure 6 depicts performance on the three conditions (lexical, pictorial and referential ambiguity) plotted separately by age group. Keeping in mind that the maximum score for each condition is 3, it appears that the greatest improvements in scores may occur between the ages of 6- and 8-years, with a flattening of scores as they reach a ceiling for children between 9- and 12-years old.

Participants' performance on the lexical and pictorial interpretation conditions were significantly different from each other ($F(1,82) = 17.658, p < .001$). These data (although cross sectional) appear to suggest that children begin at 6-years of age with a better grasp of pictorial than lexical interpretation, but seem to achieve an equal understanding of each condition by the 10th to 12th year. This observation is supported by the analyses which revealed a significant interaction between the lexical-pictorial difference and age group ($F(6,82) = 2.66, p < .03$).

Similarly, the difference between the lexical and referential interpretation conditions was also significant ($F(1,82) = 19.481, p < .001$), where performance on the lexical and referential conditions appeared to develop at a similar rate with children's performance on the referential condition being superior at any given age. In support of this, there was no interaction between the lexical-referential difference score and age group.

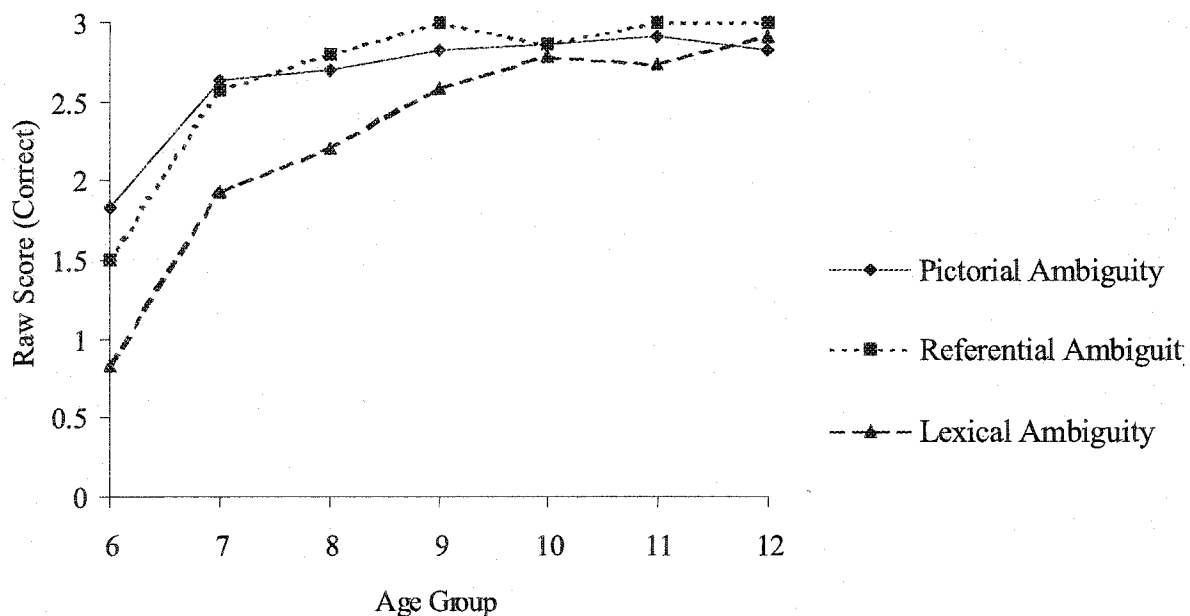


Figure 6. Three conditions of interpretive theory of mind by age.

Finally, as is suggested by the graphical representation, there was no significant difference between the referential and pictorial interpretation conditions, nor was there an interaction of this difference with age.

Overall, these results suggest that an understanding of the concepts of referential and pictorial interpretation begins to develop at an earlier age than lexical interpretation, although all three concepts seem to be generally well understood by about 10- to 12-years of age.

Display Rules

Scores were converted into percent correct for each type of display rule (i.e., verbal and facial). The data were analyzed using a 2 (Gender) by 7 (Age) by 2 (Display rule-type) mixed model ANOVA with Gender and Age as between subjects factors and Display rule-type as a within subjects factor.

The main effect of Gender was not significant. However, there were significant main effects of Age ($F(6,75) = 8.47, p < .001$), and Display rule-type ($F(1,75) = 48.60, p < .001$). The overall age effect was quadratic ($p < .02$). The omnibus interaction between Age and Display rule-type was also significant ($F(6,75) = 2.60, p < .03$). Thus, separate analyses focusing on the linear and quadratic age trends for each Display rule-type were run.

From visual inspection of the data, it appears that the most dramatic increases in children's performance are occurring between 6- and 8-years of age. In this range, children improved from achieving an average of 15 percent correct at 6-years of age, to 51 percent correct at 8-years of age. While this bears some resemblance to the children's pattern of performance on the interpretive measures, it is interesting to note that on this measure children did not reach ceiling level performance between 9- and 12-years of age, although their scores did tend to flatten out. Between the ages of 9- and 12-years old, children's average level of performance ranged between 51 and 62 percent.

In Figure 7 it appears that participants at all ages were able to provide more verbal display rules than facial display rules. However, the difference between the number of verbal and facial display rules provided does not appear to be great for the participants between the ages of 6- and 8-years of age. This was confirmed by a pair-wise

comparison of the verbal and facial display rules provided by each age group. The results suggested that only children between 9- and 12-years of age provided a significantly greater number of verbal display rules than facial display rules (p ranges from .046 to .001).

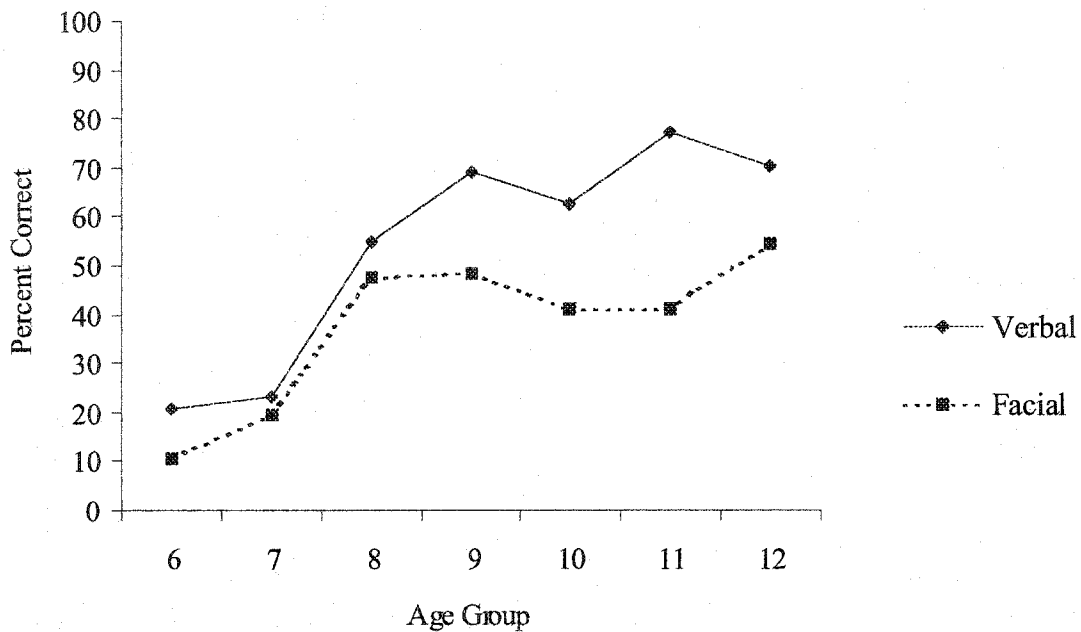


Figure 7. Performance on verbal versus facial display rules by age.

Trend analyses for each type of display rule indicated that both verbal and facial display rules increased significantly with age ($F(1,75) = 9.630, p < .001$; $F(1,75) = 5.143, p < .001$, respectively) and the trends were quadratic.

Previous studies have reported mixed results regarding whether children find it more difficult to produce display rules that are self-protective, versus those that serve to protect others. The results of this study clearly indicated that participants at all ages had

significantly more difficulty generating appropriate display rules in situations that involved the protection of oneself ($F(1,75) = 92.176, p < .001$).

Personalized Thoughts

Overall, participants' performance on this task was significantly related to age ($r = .378, p < .001$) but not gender. The pattern of development appeared again to be quadratic ($F = 6.075, p = .016$). The question was then asked: Does the participants' performance reflect merely a difficulty with the issue of ambiguity, or did the children fail to understand the difference between giving instruction to an adult or an infant? Figure 8 illustrates participants' performance by age, on each of the four conditions (mother-unambiguous, mother-ambiguous, infant-unambiguous, infant-ambiguous). By visual inspection it appears that children performed similarly for each character (mother or infant) regardless of whether the condition was ambiguous or unambiguous. This suggests that the children's main source of difficulty was not in the understanding of ambiguity. In contrast, Figure 8 illustrates that, overall, children performed more poorly on the conditions involving the infant rather than the adult. The fact that they did not perform differently on the infant-ambiguous versus infant-unambiguous conditions suggests, again, that the reason for failure on the infant conditions was not related to the understanding of ambiguity. In fact, children often tried to use the same reasoning in the infant and mother conditions (i.e., like an adult, an infant can benefit from an unambiguous instruction, but not an ambiguous one), and thus failed to recognize the important difference in dealing with adults versus infants.

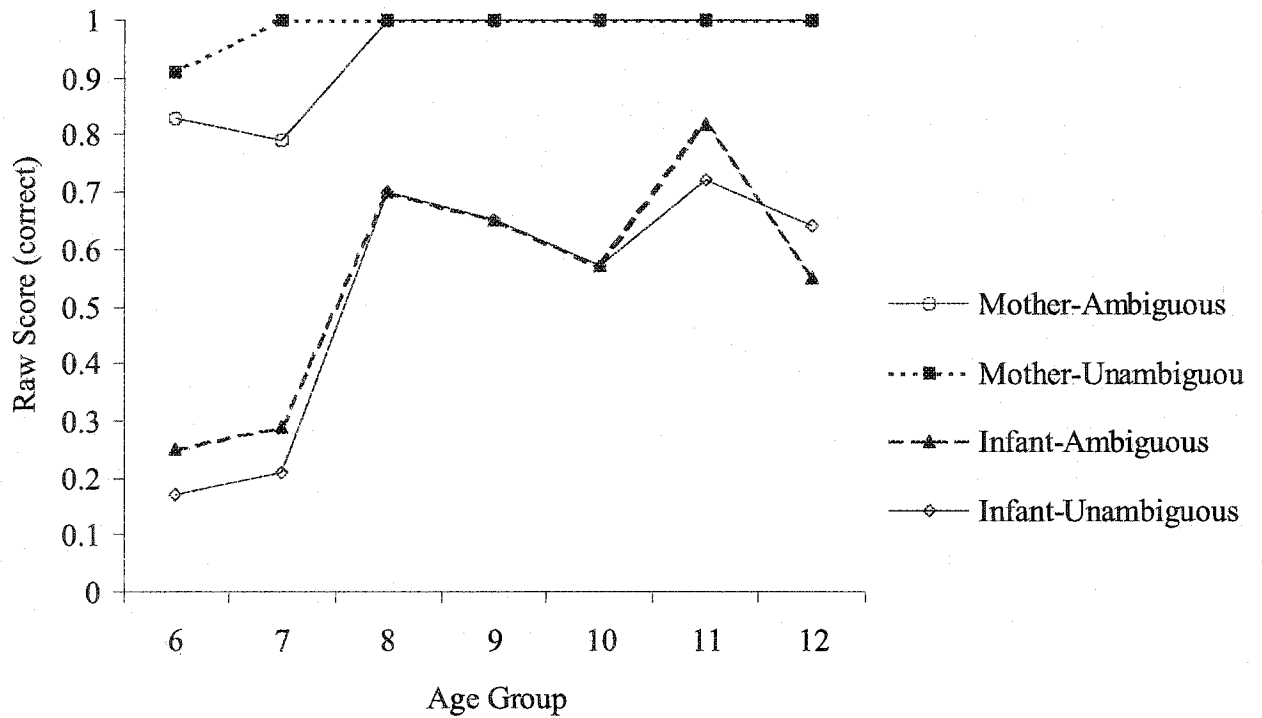


Figure 8. Four conditions of personalized thought by age.

These observations were confirmed statistically using paired samples t-tests. The results showed a significant difference between children's performance on the mother and infant conditions ($t = 8.584$, $p < .001$), but no difference in performance on the ambiguous versus unambiguous conditions.

Personalized Emotions

An analysis of children's performance on the measure of personalized emotions, a two-way ANOVA revealed a significant main effect of age group ($F = 6.017, p < .001$) but not gender. Further analyses revealed a significant quadratic trend in children's performance by age ($F = 6.806, p = .011$). The correlation with age was highly significant ($r = .473, p < .001$).

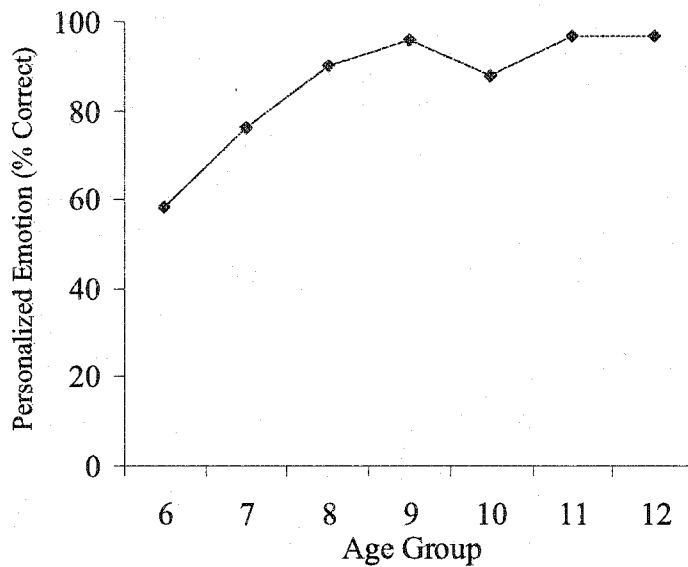


Figure 9. Performance on personalized emotion by age group

Once again, dramatic increases in performance were noted between 6- and 8-years of age, with a relative flattening of scores between 9- to 12-years of age. Children in the youngest age group (6-years old) demonstrated an average performance of 58 percent on this measure, while children between the ages of 9- and 12-years achieved average scores ranging from 88 to 97 percent, suggesting a possible ceiling effect in their performance.

Summary Score

Often, in clinical measures that include many subtests, a summary score is provided. In this case, the summary score would be intended to represent an estimate of the child's overall social competence in the areas tested. In order to evaluate whether the affective and cognitive variables could be combined into an overall competence score a constrained principal components analysis was run (Hunter & Takane, 1998). This procedure produces loadings on a component (linear combination) of the affective and cognitive variables under the constraint that the linear combination maximally correlates with age¹. The loadings for each variable on the summary score are presented in Table 2.

Given the strong loading of each measure on the predicted score, it would be reasonable to calculate a summary score representing overall performance for each participant using the regression weights from the analysis multiplied by the given participant's score on each measure. Considering the preliminary nature of this study, and the likelihood of revisions, future inclusions and exclusions from the current protocol, summary scores were not calculated or analyzed at this time.

¹ The component was calculated by regressing age on all of the tasks to create an overall score that maximally predicts age. The loadings represent correlations between the tasks and that overall score.

Table 2. Loadings of each individual measure on the summary score.

	Summary Score
False Belief, Intentional Deception & Sarcasm	.781
Interpretive Theory of Mind	.840
Display Rules	.759
Personalized Thoughts	.534
Personalized Emotions	.668

Relationship among measures: Correlations and developmental trends

These analyses aimed to examine two types of questions. First, notwithstanding age, are measures that tap the cognitive aspects of social competence related to measures that focus on affective ones? For example, are social cognitive measures more strongly related to each other than to measures of emotional competence? The analyses revealed significant correlations among all of the main scores for the five measures. The interrelationships of scores for the entire sample (N = 89) are presented in Table 3.

The correlations between cognitive with cognitive tasks, affective with affective tasks, and cognitive with affective tasks appear to be equally strong. In fact, the strongest correlation was found between a cognitive (false belief) and affective measure (display rules).

Table 3. Correlations among the five measures.

Measure	1	2	3	4	5
1. False Belief- Deception-Sarcasm	--	.518**	.540**	.355**	.462**
2. Interpretive TOM		--	.391**	.338**	.461**
3. Display Rules			--	.472**	.444**
4. Personalized Thought				--	.291*
5. Personalized Emotion					--

* $p = .006$; ** $p < .001$

The second issue of consideration was the relationship of the cognitive and affective tasks across development. Although it was not within the scope of this study to examine the nature of any causal relationships in the development of these measures, it was of interest to evaluate whether the skills required for these tasks appeared to develop in a particular order. In order to examine this, the following question was asked: At what age do at least 50% of children achieve a perfect score on each task? The results are

summarized in Table 4, illustrating the age at which each of the tasks is first passed by a majority of children.

Table 4. Age at which perfect performance on each task is achieved by at least 50% of children.

By 6 years of age	By 7 years of age	By 8 years of age	Not by 12 years of age
<ul style="list-style-type: none"> • First- and second-order false belief 	<ul style="list-style-type: none"> • Pictorial interpretation • Referential interpretation • Personalized emotions 	<ul style="list-style-type: none"> • Intentional deception • Lexical interpretation • Display rules to protect others' feelings • Personalized thoughts 	<ul style="list-style-type: none"> • Sarcasm • Display rules to protect ones' own feelings

Parent and Teacher Questionnaires – Content and Ecological Validity

Parent and Teacher Questionnaires were completed for each child who participated in the study. At the time of the study, the teachers had known their students for approximately 6-7 months. Analyses were conducted to examine elements of each questionnaire individually, as well as a comparison of the parent and teacher ratings for each child. Finally, the relationship between each questionnaire and the objective test measures was investigated.

Within each questionnaire, ratings on the three subscales and the total score were highly intercorrelated (see Table 5). Although two of the subscales and the Total score from the Parent Questionnaire were correlated with age (Cognitive: $r = .402$, $p < .001$; Affective: $r = .287$, $p < .01$; Total: $r = .325$, $p < .01$), the Behaviour subscale from the Parent Questionnaire and none of the subscales or the Total score from the Teacher Questionnaire were significantly related to age.

Comparing the two versions of the questionnaire, parent's and teacher's ratings of the participants were correlated for the Behaviour Subscale ($r = .342$, $p = .001$) and the Total Score ($r = .248$, $p = .019$). Parent's and teacher's ratings on the Cognitive subscale were marginally correlated ($r = .181$, $p = .090$). There was no significant difference between the mean overall ratings given by parents and teachers on the questionnaires. However, teachers did tend to rate the participant's higher on average on the Cognitive and Affective subscales ($t = 2.127$, $p = .036$ and $t = 3.621$, $p < .001$, respectively) and lower on the Behaviour subscale ($t = -4.980$, $p < .001$) than did parents.

Table 5. Correlations between Cognitive, Affective, Behaviour and Total Scores for the Parent and Teacher Questionnaires.

	Parent Questionnaire				Teacher Questionnaire			
	1. COG	2. AFF	3. BEH	4. TOT	5. COG	6. AFF	7. BEH	8. TOT
1.	--	.756	.438	.913				
2.		--	.475	.894				
3.			--	.697				
4.				--				
5.					--	.811	.779	.930
6.						--	.806	.905
7.							--	.946
8.								--

Note: COG = Cognitive subscale; AFF = Affective subscale; BEH = Behaviour subscale;

TOT = Total score.

All p 's < .001

In terms of validity, it is important to demonstrate the participant's performance on the objective measures is related to the behaviours and abilities of social competence they demonstrate in everyday living. The correlations between the parent/teacher ratings and the individual measures are presented in Table 6.

Table 6. Correlations between the Parent/Teacher Questionnaire and the objective measures.

	False Belief,				
	Intentional	Interpretive			
	Deception	Theory of	Display	Personalized	Personalized
	& Sarcasm	Mind	Rules	Thought	Emotion
<hr/>					
Parent Questionnaire					
Cognitive	.364***	.406***	.386***	.190 ⁺	.330**
Affective	.280**	.176 ⁺	.263*	.040	.163
Behaviour	.076	.076	.152	.011	-.075
Total	.307**	.288**	.337***	.113	.203 ⁺
<hr/>					
Teacher Questionnaire					
Cognitive	.287**	.338***	.188 ⁺	-.001	.257*
Affective	.262*	.296**	.204 ⁺	.011	.187 ⁺
Behaviour	.188 ⁺	.146	.105	-.112	.165
Total	.255*	.262*	.165	-.051	.219*

* $p < .05$; ** $p < .01$; *** $p < .001$.

⁺ $p < .10$.

Reliability

Interrater reliability and test-retest reliability for each of the measures is presented in Table 7.

Table 7. Interrater Reliability and Test-Retest Reliability for the Measures.

Measure	Interrater Reliability	Test-Retest Reliability
<u>False Belief, Intentional Deception &</u>		
Sarcasm	.83	.28
Interpretive Theory of Mind	.89	.82
Display Rules	.93	.93
Personalized Thought	.90	.45
Personalized Emotion	.64	.84

Discussion

The goal of this study was to begin to bridge the gap between empirical knowledge and clinical practice. In doing so, an attempt was made from a methodological standpoint, to develop measures of social competence that would be applicable and appropriate for clinical use. At the same time, by examining a broad range of topics, this study afforded the opportunity to look more carefully at the relationship between aspects of social competence, on a more conceptual level. Both the methodological and conceptual findings and their implications are discussed below.

At the outset, several guidelines were established as criteria for developing a clinically useful measure of social competence (see p. 29-30). First, a goal of this study was to be able to assess a broad range of skills and abilities relevant to social competence. Tasks were selected based on extensive research and included many

different components of social interaction considered important by other researchers, including several of the aspects of emotional competence described by Saarni (1999) and some of the well-researched aspects of social cognition. Moderately-sized correlations among all of the measures suggests that a relationship exists. At the same time, failure to find stronger correlations indicates that these five measures are not tapping exactly the same construct. The constrained principal components analysis also provided evidence of the independent contributions of each of the measures in predicting overall performance.

Second, the goal of providing normative data across a wide range of ages was also met. Normative data for five tasks was collected for children between 6 and 12 years of age. The only floor effects were seen as expected in the false belief tasks. Children typically achieved perfect performance on these stories by 6 to 9 years of age. Rather than excluding this portion of the task from future testing, it was important to maintain it as part of the overall task for several reasons. First, given the relatively poor performance of the six-year olds on the other tasks in this battery, it was important to establish and demonstrate that even the younger school-aged children were able to complete these fundamental stories. This suggests that in early middle childhood, children may have difficulty understanding concepts, such as intentional deception and sarcasm, that is not a result of a general misconception of the nature of beliefs and intentions per se. The second reason for keeping this portion of the task is for clinical utility. When testing children with cognitive impairments, poorer performance on these tasks may be noted, and it will be important to provide data for normative comparison in these cases in order to establish potential areas of weakness. Taken together with the

intentional deception and sarcasm stories, children's performance on this overall task (including false belief stories) demonstrated good variability with improving levels of performance between 6 and 12 years of age.

Ceiling effects were apparent on several tasks in this study despite previous research suggesting more variable performance in children between 6 and 12 years of age. On the interpretive theory of mind tasks, perfect performance was achieved by most children by 8 years of age. Still, understanding the interpretive nature of thoughts is considered an integral aspect of the social-cognitive skills children acquire during middle childhood. It is likely that this level of understanding represents a building block for more sophisticated cognitive and emotional understanding to come. For example, older children come to understand how personality traits can influence a person's point of view, or how a particular upbringing can cause an individual to react in a particular way that may be unusual. Understanding that different people can have different interpretations of the same situation or stimuli is essential for these developmental progressions. Thus, despite the ceiling effect seen on this task, the task was maintained considering the impact it may have on the development of more complex skills and the importance of measuring these progressions in clinical populations.

Overall, children's performance on the stories involving display rules tended to flatten out around 9 years of age. Interestingly, this ceiling effect did not result from children achieving perfect performance at any age. At best, children performed at around 60% on this task. As noted in the Results, children achieved slightly higher levels of success in generating verbal display rules (70-80% at best) than facial display rules (45-50%) although a similar pattern of flattening around 9-10 years of age was still seen for

both types of rules. One possible explanation for the ceiling effect on this task may lie in the distinction between display rules that serve to protect the feelings of others, and those that are designed to protect the interests of the self. As was reported earlier in the Results section, children in this study tended to be more successful in providing display rules to protect others rather than for themselves (or the main character in the story). In both cases (self and others), children demonstrated some leap in their level of understanding around 8 years of age. At this point, children appeared to possess a relatively high degree of understanding display rules as they applied to serving others. Children who were 9 years of age or older scored between 73% and 84% on these stories. In contrast, children's knowledge of display rules for the self appeared to increase gradually from 25% at 8 years of age, to only 41% at 12 years of age. Reasons for this difference between self- and other-motivated expressions of display rules are discussed in detail later in this discussion. Nonetheless, the ceiling performance of older children on the "other" stories may be contributing to the overall flattening of this scale. Room for improved performance by older children still exists in the display rules to protect self-interest, and therefore, this task was also retained for further investigation.

Finally, children's performance on the tasks involving personalized thought and personalized emotion both tended to reach ceiling around 9 years of age. Near-perfect performance on each of these tasks indicated that by this age, children were actively considering personal information when making judgments about an individual's feelings or beliefs. The thematic content of the stories used in the Personalized Emotion task and the scenario of the Personalized Thought task were both relatively simple in order to ensure familiarity for all of the participants. It is possible that scenarios involving more

sophisticated personal information (e.g., personality traits) or more mature situations may yield greater differentiation among the older participants, and are worthy of further investigation.

Considering again the criteria set out for this study, the measures both facilitate clinical interpretation and have a relatively short administration time (third and fourth goals, respectively). Scoring details were created and/or modified to allow for greater variability in scoring and comparison of performance continuously across middle childhood. The total administration time for the protocol ranged from 30 to 50 minutes. This included all 6 of the original tasks and the screening measure (WISC-III Vocabulary subtest). Thus, it is likely that the administration of the remaining five measures alone would be 20-40 minutes. Typically, younger children took longer to complete the tasks, although some older, and more talkative children also required longer durations.

Demonstrating the ecological validity of these measures (fifth criteria) was fundamental to this project for several reasons. In the psychometric sense of the phrase “ecological validity,” it was important to establish a relationship between the clinical measures and children’s everyday social behaviour. This was accomplished by comparing objective test performance with parent and teacher ratings of children’s social skills and performance in social transactions. Overall, the strong correlation between these ratings and the clinical measures suggests a relationship between the objective tasks and what they were intended to mirror – real life performance. Interestingly, children’s performance on both the cognitive and affective tasks correlated most highly with questionnaire items that were considered “cognitive”, although several tasks also correlated with the “affective” subscale as well. This may reflect the intertwining of

cognitive and emotional development in producing the behaviours or skills included in the questionnaires. Also, the objective tasks in this study required children to *think about* something – be it thoughts or emotions. While some of the questionnaire’s “affective” items queried children’s ability to *think about* emotion, many of the items targeted skills related to emotional expression or recognition. Because of the cognitive underpinnings of these skills, perhaps it is not surprising to find a strong relationship between performance on these types of tasks and parent and teacher reports of more “cognitive” abilities. In order to tap the types of affective skills and behaviours rated by parents and teachers on the “affective” subscale of the questionnaires, it may be worth including objective measures of emotion recognition, matching, or even recognition of nonverbal cues in the overall battery.

Although relatively strong relationships were noted between the objective measures and the Cognitive and Affective subscales of the questionnaires, hardly any relationship was observed between these tasks and the Behaviour subscale. Closer examination of these items suggests that parent and teacher ratings on these items tended to be less variable than other items. The ratings reflected a more dichotomous response pattern suggesting the presence or absence of the behaviour in the child rather than degrees of ability. Originally, these items were designed to include social behaviours that could be expected of children between 6 and 12 years of age, as well as behaviours that have been commonly reported as problematic in children with various cognitive and social impairments. Thus, it may not be surprising that these items were rated as merely being present or absent, rather than along a more graduated scale. In the future, it may be worthwhile including these items in a separate section at the end of the questionnaires,

using a dichotomous rating format (yes/no). In clinical populations this would allow for the identification of problematic behaviours, without contributing to the overall score on the questionnaire.

Finally, another reason why the ecological validity of the tasks was of paramount importance to this study is because, by definition, the actual performance of these skills in social transactions is key to social competency. As Saarni pointed out, it is “when we have to relate to others [that] our dysfunction becomes most apparent” (p.302). In a protected or secluded environment, a lack of social interaction skills may not be as detrimental to an individual’s sense of self-efficacy. In a sense, parent and teacher ratings may represent a third party view of each child’s actual social competence. In the future, it would be important to compare these third party perspectives with a first-person, self-evaluation of these same behaviours. This would not only provide additional information into the level of insight clinical patients have about their own areas of strength and weakness, but also to provide a method for evaluating discrepancies between objective task performance and the subjective ratings. Such differences, seen in clinical evaluations, may represent actual discrepancies between skill development and the application of knowledge to everyday behaviour. In other cases, differences in reporting may reflect different perspectives or levels of awareness regarding areas of concern.

In summary, from a methodological standpoint, this study yielded five tasks related to social competence that may be appropriate for clinical use in school-aged children. The ability of these tasks to differentiate among typical and atypical populations remains to be seen. Based on the ceiling effects around 9-10 years of age,

further investigations of tasks and skills that develop later in childhood and adolescence seem warranted.

Conceptually, this study aimed to examine the relationship between social cognitive skills and emotional understanding. The study was instituted with the belief that both social cognition and emotional competence contribute to the development of social competence, and that there is likely a significant intertwining of these skills throughout development. Although several theorists have proposed models depicting a relationship between cognitive and emotional functioning, few studies have examined this relationship systematically. The results of this study supported the notion of a cognitive-affective relationship in development, with strong correlations between all of the objective measures. In fact, equally strong correlations were noted between different cognitive measures, between different affective measures, and between cognitive and affective measures, suggesting that, relationships among these tasks may be better understood on a more conceptual level than according to their surface features (i.e., not simply according to their cognitive and affective content).

It has been suggested that the development of certain emotional skills demands a requisite level of cognitive functioning (e.g., Saarni, 1999). In other words, a cognitive concept must be acquired and mastered on its own before it can be applied to the understanding and development of other related concepts. It is therefore likely that skills involving similar underlying concepts will emerge around the same point in development. This was supported by the ages at which the different tasks seemed to emerge in this study. Certain fundamental concepts such as false belief and deception are known to

develop in the preschool and early school years (i.e., ages 3-5) and this makes sense in terms of the development of more sophisticated concepts that follow. Also, studies have shown basic emotion recognition and expression to develop as early as infancy, setting the stage for additional building blocks to be added.

Considering the ages around which at least 50% of children successfully completed each task, it is not surprising that once children established an understanding of second order false belief (6 years old), and interpretive theory of mind (7 to 8 years old), the understanding of display rules and intentional deception followed shortly after. In many ways, display rules are an expression of intentional deception. In fact, the types of answers children gave in response to the intentional deception stories could be construed as explanations for why one of the characters exhibited a display rule. For example, why did the young girl's father say that it was the best drawing he'd ever seen, when it was not true? Although children did not generate the expression of the rule themselves in this task, correct responses demonstrated an understanding of the rationale for intentionally lying to another person in order to protect them in some way. Furthermore, children demonstrated an appreciation of the method that was used in order to accomplish that deception. In other words, understanding intentional deception may represent the basic or fundamental concept, while the use of display rules may represent an understanding of the methods by which such deception may be carried out. Additionally, the display rule stories examined more carefully the differing situations and motivations that an individual might have for creating an intentional deception.

Considering that, although children came to understand the need for display rules to protect others around the age of 8 years, many children had not yet grasped the

relevance of display rules for the protection of self-interests even by the age of 12 years. This again represents a new level of understanding and likely requires a more sophisticated level of cognitive functioning, namely mental flexibility.

Display rules for others, in many ways, could be considered a collection of socially acceptable rules generated by one's community and specific to one's culture. A person comes to learn the appropriate display rules for interacting in various situations by growing up as a member of his/her society. For the most part, these rules are relatively invariable and can be acquired through practice and memorization over time, once the child has developed the necessary level of cognitive functioning to understand the concept of display rules at all. In fact, some researchers have suggested that children may demonstrate display rule behaviour and intentional deception long before they are able to express an understanding of its rationale (e.g, Josephs, 1993; also see Saarni, 1999 for further discussion). Lalonde and Chandler (1995) demonstrated that social skill knowledge and theory of mind skill is dissociable, such that adequate social knowledge (e.g., knowing when to say "please" and "thank you") does not translate into mental state understanding. Thus, the acquisition of this type of knowledge and the application to everyday practice can be accomplished by relatively younger children because of the low demand for decision-making skills in a given situation. Display rules of this nature follow a pattern of: if [*a given situation*] then [*a display rule*]. This difference in mental flexibility was nicely demonstrated by some of the children in this study. To the question of how a girl should respond to tasting a terrible homemade cookie in front of her friend's mother, the youngest children (6-7 years) responded truthfully (e.g., "Yuck, I don't like this"), while slightly older children expressed knowledge of the culturally-appropriate

display rule for this situation (e.g., by being gracious and saying that the cookie was good). Some even older children (11-12 years) expressed an understanding of the correct display rule, but also demonstrated more complex thinking by suggesting that it would be possible not to eat the cookie without directly lying to the friend's mother either (e.g., by saying, "No thank you, I'm not very hungry right now."). These children demonstrated skills in flexible thinking and problem-solving beyond the rote application of a rule in a given situation. This type of thinking may be related to the later development of display rule usage in protecting one's self-interests. In these cases of protecting oneself, rules cannot be developed and applied with the same kind of rigidity because, as individual situations vary, so does the appropriate response. Methods of intentional deception in these scenarios must be creative and spontaneous, reflecting a higher degree of mental flexibility that is not typically developed by children until late childhood and throughout adolescence.

Thus, as predicted in models such as the one used in this study, the development of skills in emotional and social understanding may be inextricably linked to an individual's level of cognitive ability. Rather than differentiating among tasks purely on the basis of their surface content (i.e. because it is about emotions or thoughts), it may be beneficial to embrace a more complex view of social competence that values the reciprocal relationship of cognitive and emotional understanding throughout development. It is unlikely that a true understanding of social competence can be achieved without accounting for such factors as biology, social experience, cultural context and the necessary interactions among each of these in producing complex social behaviours.

Although it was never the goal of this study to create a measure that could ultimately account for each of these factors in children's development of social competency, the development of these measures is not incompatible with this type of approach. Further research could be directed at examining the relationship of these types of tasks with aspects of a child's social and cultural experience. Indeed, some of this research has already begun (see Saarni, 1999 for some examples).

Ultimately, it was the primary goal of this study to forge a stronger relationship between the ever-growing empirical knowledge of social competence development, and the undeniable need for adequate clinical evaluation and intervention in this same area. The results of this study provide a necessary first step in the development of normative data for clinically useful measures. The value of these particular measures and others of this kind in the clinical domain, remains to be borne out by additional research and clinical application.

Support for this project by teachers, clinicians and researchers alike, suggests that the importance of broadening our understanding of social competence is far-reaching. Unlike children with learning disabilities who are challenged academically, children with social impairments bear the burden of their disability in almost every environment. It is undeniable that one's attitudes and opinions of another individual stem largely from social interchanges. Being at a social disadvantage puts children at risk for poor relationships with peers, parents and teachers. From an educational standpoint, increased awareness of social impairments can serve to encourage acceptance and understanding by teachers towards these challenging students.

Moreover, teachers represent a rich source of information regarding children's social interactions, coupled with specific training in education and remedial strategies. Perhaps, then, one must consider bridging the gap between many professionals, in order to extend our knowledge from research to assessment and ultimately towards remediation of social difficulties.

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Appendix A. Brief demographics for the two regions of the sample (Statistics Canada).

	Region 1	Region 2
Population in 1996	7243	6356
Mother Tongue		
English	4330	3960
French	50	20
Chinese	1455	1330
Home Language		
English	5115	4930
French	20	-
Chinese	1360	960
Ethnic Origin		
English	815	450
Canadian	790	685
Chinese	1720	1605
Polish	675	600
Jewish	2610	2585

Appendix B. Sample false belief, intentional deception and sarcasm stories

First-order False Belief

John and Anna are making a birthday present for their mother. John is using the glue and Anna is using the tape. When they finish, John says, "I will go and hide the present in my room so it will be a surprise". John puts the glue on the table and goes to hide the present. Anna starts cleaning up the kitchen. She takes the glue from the table and puts it in the drawer. Then she goes to watch t.v. in the den. Soon, John comes back to the kitchen. He needs the glue to make a card for his mother.

Memory Questions: Where is the glue right now?

Did John see Anna move the glue?

Prediction Question: When John comes back where will he look for the glue?

Explanation Question: Why will he look there?

Second-Order False belief

The grade three class is going to get a new pet. A little bunny named Whiskers. The teacher, Mrs. James, wants the bunny to be a surprise. She tells the class they will be getting a turtle. She hides the bunny in the coatroom so that she can surprise the class after lunch. The bell rings, and one of the students, Sally, goes to the coatroom to get her skipping rope. She sees the bunny. Sally thinks, "We are not getting a turtle for our class

pet, we are getting a bunny!” Then she goes to have lunch. Mrs. James does not see Sally find the bunny. At lunch, the principal says to Mrs. James, “Do any of your students know you got a bunny for the class?”

Memory Questions: What new pet did Mrs. James get for her class?

Did Mrs. James see Sally find the bunny?

Prediction Question: What does Mrs. James say to the principal?

Explanation Question: Why does she say that?

Intentional Deception

Tina got a new pair of rollerblades for her birthday. Tina does not know how to skate, but she wants to learn. Everyday Tina goes outside to practice on the street in front of her house. Tina is not very good at skating. She falls down a lot. Tina's friend Jeff is outside playing with his yo-yo. Jeff sees Tina fall down many times. Jeff walks over to talk to Tina. Tina says to Jeff, "I have been practicing my skating everyday. Can you tell?" Jeff smiles and says, "Yeah, you are pretty good".

Memory Question: What happened in the story?

Question 1: Did Jeff think Tina was a good rollerblader or not?

Question 2: How do you know?

Question 3: Did Jeff want Tina to think that she was a good rollerblader or not?

Question 4: How do you know he wanted Tina to think that?

Sarcasm

Over the summer Daniel grew three centimetres. Some of his old clothes do not fit him anymore. One morning Daniel gets dressed and sees that his blue pants are too short. His socks are sticking out from the bottom of his pants. Daniel wears the blue pants to school anyway, because he will not have time to get new pants until the weekend. At

school, Daniel sits next to Sarah. Sarah looks at Daniel's short pants. She giggles and points at the pants. Sarah says, "Those pants are very stylish".

Memory Question: What happened in the story?

Question 1: Did Sarah think that Daniel's pants were nice or not?

Question 2: How do you know she thought that?

Question 3: Did Sarah want Daniel to think she liked his pants or not?

Question 4: How do you know she wanted Daniel to think that?

Appendix C. Sample display rules stories

Story #1 – Prosocial

This is a story about David. Last week it was David's birthday. David's grandmother came for dinner and gave David his birthday present. She was there when David opened it. It was a hat. David thought it was very ugly.

What did he say?

Why did he say that?

What kind of face did he make?

Why did he make that face?

Story #2 – Self-protective

This is a story about Kim. Kim likes to play the piano. She practices her songs every day. One day Kim enters a contest for piano playing. She plays her favourite song but still she does not win. At the end of the contest, the winner gets a prize. Everybody claps.

What did she say?

Why did she say that?

What kind of face did she make?

Why did she make that face?

Appendix D. Sample multiple emotions story

It is a school day. Your teacher announces that today the class is going to begin reading a new story. The teacher wants someone to start reading the story out loud. She looks around the classroom at all of the students. Then she chooses you.

Appendix E. Sample personalized emotions story

This is a story about Donna. One night, on television, Donna watched a movie about poisonous snakes that live in the jungle. The snakes had large mouths and giant, sharp teeth. The next day, Donna's teacher announced to the class that they were going to have a new class pet: A snake named Fang!

Appendix F. Sample items from the Parent and Teacher Questionnaires

1. Does your child understand the meaning of a sarcastic remark?
2. Does your child make appropriate eye contact during conversations?
3. Does your child try to win an argument by persuading someone to change their mind?
4. Does your child understand the difference between something that is done “on purpose” versus “not on purpose”?
5. Does your child acknowledge that two people can have different opinions on the same issue?
6. Is your child able to tell how others are feeling by “reading” their facial expressions?
7. Does your child understand when they are being teased?
8. Does your child use gestures to express a nonverbal emotional message (e.g., giving a hug or a wink)?
9. Is your child able to show empathy towards others?
10. Does your child understand that some might not always agree with their point of view?
11. Does your child appropriately use words like: guilty, proud, shame
12. Is your child able to act spontaneously in social situations?
13. Does your child understand that it is possible to “change your mind”?
14. Is your child able to think about how things might be in the future?
26. Does your child misunderstand social situations?

Appendix G. Normative data.

Age	<u>n</u>	False-belief, Deception, Sarcasm	Interpretive TOM	Display Rules	Personalized Thoughts	Personalized Emotions
6-years	12					
M		56.25	46.30	15.63	54.17	58.33
<u>SD</u>		17.27	28.75	20.73	23.44	28.87
7-years	14					
M		66.07	79.37	21.43	57.14	76.19
<u>SD</u>		10.32	18.93	25.21	22.85	27.51
8-years	10					
M		62.50	85.56	51.25	85.00	90.00
<u>SD</u>		10.21	18.92	25.99	24.15	16.10
9-years	17					
M		77.94	93.46	58.82	82.35	96.08
<u>SD</u>		15.01	13.64	23.70	22.99	11.07
10-years	14					
M		75.00	94.44	51.79	78.57	88.10
<u>SD</u>		18.99	8.44	22.39	25.68	28.06
11-years	11					
M		82.95	95.96	59.09	88.64	96.97
<u>SD</u>		14.00	8.99	16.86	20.51	10.05
12-years	11					
M		85.23	96.97	62.50	79.55	96.97
<u>SD</u>		9.87	7.19	25.62	24.54	10.05