ABSTRACT

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This study examines a new method of assessing emotion understanding in preschoolers. Prior research has established that preschool is a critical time for emotion understanding development and that emotion understanding abilities are related to such important outcomes as social competence. Traditionally, measures of emotion understanding present multiple-choice questions that require children to select one emotion that is most likely to be elicited in various situations. However, this study proposes an alternative method in which children are asked to explain their answers on a subset of items. Their open-ended responses are then coded for quality of reasoning. Results establish preliminary evidence of the reliability and validity of the new assessment method. Notably, multiple regression analyses indicate that the coded emotion reasoning scores are a better predictor of social competence than

scores obtained using traditional multiple-choice procedures. Limitations of the study and implications for future research are also discussed.

ASSESSMENT OF EMOTION UNDERSTANDING IN PRESCHOOLERS: MULTIPLE-CHOICE VS. OPEN-ENDED METHODS

By

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Dedication

This thesis is dedicated to my parents, Bonnie and Butch Verron, who have never failed to love and support me from the very beginning.

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Chapter 1: Overview of the Literature

Emotion understanding is a construct that has received increasing attention in child research. It has been related to such important outcomes as the ability to regulate emotional arousal (Schultz, Izard, Ackerman, & Youngstrom, 2001), the ability to establish positive peer relationships (Izard, Fine, Schultz, Mostow, Ackerman, & Youngstrom, 2001), prosocial behavior (Iannotti, 1985), and even school success (Leerkes, Paradise, O'Brien, Calkins, & Lange, 2008). Children who are deficient in emotion understanding abilities are more likely to be rejected by peers and to exhibit greater behavior problems, including problems with aggression (Schultz, Izard, & Bear, 2004). Such children are particularly likely to misinterpret social and emotional cues and thus struggle with navigating the complex social and academic worlds that are inherent in early schooling. Therefore, it is evident that emotion understanding abilities are critical for children to develop, especially in their early years.

In order to gain a better understanding of the current literature and state of research in the emotion understanding field, over 30 studies on emotion understanding were reviewed. When reviewing the studies, the following questions were considered: How do investigators define emotion understanding? How do researchers conceptualize emotion understanding in relation to other constructs? What measurement techniques are used to assess emotion understanding? The overriding question considered was how emotion understanding is conceptualized and measured in preschool populations, with a particular focus given to how its measurement may be improved. An overview of the findings from many of these

studies, including sample characteristics and related constructs, can be found in Table 1.

Defining Emotion Understanding

Despite the increased focus on emotion understanding in recent years, a review of the literature has revealed that several inconsistencies as to how emotion understanding is defined and conceptualized are still evident in the field. For example, though "emotion understanding" is the term used in the present investigation, previous investigations have offered many other terms. In the literature the term "emotion understanding" has often been used interchangeably with terms such as "emotion knowledge," "emotion situation knowledge," "affective perspective taking," "emotion prediction," and "emotion recognition." Researchers have also varied vastly in how they define these terms, as is illustrated in Table 2. For instance, Southam-Gerow & Kendall (2000) define emotion understanding as simply referring to "people's knowledge about their feelings" (p. 319), while Cassidy, Werner, Rourke, & Zubernis (2003) define it as "the ability to understand another's emotional state based on a given situation in the world" (p. 2003). Though the first definition is broad and focuses on knowledge of one's own feelings, the latter takes a different approach to defining emotion understanding by focusing on the specific ability of understanding the emotions of others in particular situations. Such differences are common in the literature. Ultimately, how emotion understanding as a construct is defined in a given investigation is typically closely tied with how it is operationalized within each study.

This inconsistency and lack of a clear definition in the literature may be in part due to the fact that the skills that characterize emotion understanding change with development. Several theoretical models of emotion knowledge development have been proposed (see Table 3). Denham (1998), for example, posits that there are nine levels of emotion knowledge. At Level 1 is the ability to simply recognize and label facial expressions. Level 2 involves the ability to identify stereotypical emotion-eliciting situations, but the same ability for nonstereotypical situations is not theorized to begin until Level 5. Later levels of emotion understanding, on the other hand, involve more complex abilities such as utilizing emotion regulation strategies, understanding display rules, understanding mixed emotions, and developing moral emotions. Pons, Harris, & de Rosnay (2004) propose a very similar model but also distinguish between the understanding of emotions that are based on desires (e.g. happy) and those that are based on beliefs (e.g. surprised). In both models, children are theorized to experience an age-related progression of emotion knowledge from toddlerhood into childhood.

Development of emotion understanding. Due to changes in emotion understanding throughout development, how it is defined and measured are likely to differ depending on the population of focus. Children first become able to recognize and label facial expressions around the age of 18 months (Bretherton, McNew, & Beeghly-Smith, 1981). Facial expressions of happiness are recognized first, while the ability to distinguish between negative expressions of sadness, anger, and fear develops later (Denham & Couchoud, 1990; Camras & Allison, 1985). Though recognizing facial expressions is the most basic emotion understanding ability

proposed in Denham's (1998) model, it is one of particular importance. As Pollak, Cicchetti, Hormung, & Reed (2000) explain, "it represents the early utilization of social cues in which children's subsequent interpretations and behavioral responses will depend" (p. 680).

The next emotion understanding skill that develops, the ability to identify which emotions are likely to be elicited in various situations, emerges during the preschool years. This ability is supported by children's increasing cognitive and theory of mind abilities, which allow them to understand the perspective of others (Cutting & Dunn, 1999). A study by Gnepp, McKee, and Domanic (1987) supported this, finding that children as young as four years of age are able to understand that almost everyone feels the same way in unequivocal situations and that individual differences influence one's reactions to more equivocal situations. These findings suggest that preschool-aged children are able to consider how another might feel instead of basing answers on their own viewpoint. Thus, it is around this age that emotion understanding abilities become increasingly sophisticated and important. It is also during this developmental period that children become able to verbalize more coherently and fluently about the causes of their own and others' emotions (Denham, 1986; Denham & Couchoud, 1990), making the preschool age a common focus in emotion understanding investigations.

Emotion understanding and social competence. Previous research with preschoolers has also revealed that emotion understanding development is tightly intertwined with social competence. According to Rose-Krasnor's (1997) prism model, social competence cannot be reduced to specific, predefined behaviors.

Rather, at its topmost level it is broadly defined as “effectiveness in interaction’ (p. 119). Social competence is thus viewed not as an ability that resides within individuals, but instead as a joint product of individuals and their social environments.

Although social competence is considered a broader concept, Rose-Krasnor (1997) explains that the bottom and most concrete level of her prism model of social competence represents the “behavioral base … upon which higher levels are built” (p. 123). This bottom level includes specific abilities, such as perspective taking, communication, and problem solving skills. In this way, emotion understanding skills are theorized to be one of building blocks of social competence.

Additionally, it is important to note that, according to this view, children are likely to require certain sets of skills and behaviors in order to be socially competent. However, simply possessing these skills is not sufficient to ensure social competence. For example, in everyday interactions children have been noted to fail to perform a behavior which is within their repertoires due to a lack of motivation or high emotional arousal (Rose-Krasnor, 1997). Thus, other considerations such as motivation and the ability to employ skills in appropriate conditions are also viewed as important aspects of social competence.

In line with this view, previous investigations have confirmed the underlying link between emotion understanding and social competence. For example, studies conducted by Deneault and Ricard (2013) and Thayer (2013) found that preschooler social competence was significantly predicted by emotion understanding abilities. Other related constructs such as self-regulation and social problem solving have been

found to contribute to social competence in early childhood (for a review, see Rose-Krasnor and Denham, 2009), as well, consistent with the notion that other abilities beyond those captured by emotion understanding also play an important role in social competence.

Measuring Emotion Understanding in Preschoolers

Though it is clear that emotion understanding abilities are important in child development, measurement issues are still present in the field. Emotion understanding is an abstract concept, and thus it is critical that it be measured accurately. As discussed, it is theorized that emotion understanding at preschool ages typically involves two abilities: the identification of others' emotions from facial expressions and the identification of emotions that are likely to be elicited by common social situations. Though most previous investigations of emotion understanding in preschoolers have sought to measure these two abilities, a standard method of assessment has not yet been determined. Instead, a range of measures has been used by various researchers.

Previous investigations tend to utilize performance measures when assessing emotion understanding in preschool populations. A review of studies investigating emotion understanding reveals that these measures often involve two types of tasks: emotion identification and affective perspective taking. Emotion identification tasks require the child to label various emotions from photographs and/or line drawings of facial expressions. Affective perspective taking tasks, on the other hand, require children to infer how another person may be feeling in various situations. Children

are typically presented with several emotions from which to choose in both tasks, such that both task types are presented in a multiple-choice type format.

Previous studies in preschoolers have found that performance on these emotion identification and affective perspective tasks is highly correlated, which has typically led researchers to combine scores from the two tasks into an overall emotion understanding aggregate. Though this aggregate tends to demonstrate moderate to high internal consistency (Denham, 1986; Dunn & Hughes, 1998; Youngblade & Dunn, 1995), the use of such an aggregate portrays emotion understanding as a unidimensional construct. As Bassett, Denham, Mincic, and Graling (2012) state, this unidimensional portrayal of emotion understanding is a "data-driven, not theoretically derived, concept" (p. 262), and as a result, this practice has likely obscured how theoretically different levels of emotion understanding, such as emotion identification and affective perspective taking, differentially relate to child outcomes.

Bassett et al. (2012) sought to examine the practice of combining emotion identification and affective perspective tasks and whether emotion understanding truly is a unidimensional construct. They performed a confirmatory factor analysis on the Affective Knowledge Test (Denham, 1986), a widely used measure of emotion understanding that includes both emotion identification and affective perspective taking tasks. Their results corroborated a model of emotion understanding in which emotion identification and affective perspective taking are, in fact, distinct yet highly interrelated facets of emotion understanding. They state that the high correlation between the two task types may be explained by the hierarchical development of emotion understanding. Higher levels of emotion understanding (i.e. understanding

which emotions are likely to be elicited in various situations) are built upon lower levels of emotion understanding (i.e. identifying facial expressions). Thus, it is not surprising that performance on the two task types are highly related despite the fact that they seek to measure two distinct abilities.

Previous studies have also suggested that affective perspective taking abilities are especially important in preschool-aged children. As children enter this stage of development, their emotion identification abilities have already developed substantially. However, their affective perspective taking abilities are just emerging, and more individual differences are likely to be exhibited at this level. One study by Denham, McKinley, Couchoud, and Holt (1990) found that only affective perspective taking performance was significantly related to preschoolers' peer likeability, whereas emotion identification performance was not. A study by Garner (1999) found a similar result, with only affective perspective taking performance relating significantly to later expression regulation knowledge. Thus, this investigation focuses primarily on affective perspective taking abilities, seeking to examine its measurement in preschoolers more closely.

Affective perspective taking measurement. As mentioned, most studies measuring affective perspective taking abilities follow a multiple-choice format that require children to indicate how another person might be feeling in various situations. However, researchers have frequently differed in how these tasks are structured and implemented. A review of these varying multiple-choice methods of assessment is presented in Table 4.

Early measures were confusingly labeled as measures of empathy (Iannotti, 1985; Borke, 1971). In Iannotti's (1985) measure, preschoolers were told stories about a picture. In half of the items, the emotional expression of the character was consistent with the situation, and in the other half, the emotional expression of the character was incongruent with the situation. After hearing each story, children were asked to indicate both their own feelings and the feelings of the story character. Children indicated their responses by pointing to one of eight drawings of faces. A similar procedure was used by Reichenbach and Masters (1983), who designed many of their vignettes to contain contradictory cues about the characters' affective states. However, results from studies that utilized these types of measures yielded inconsistent findings. For example, in Iannotti's (1985) study, performance on the "empathy" task was not significantly correlated to prosocial behaviors as measured by both natural observations and more structured laboratory tasks. Ultimately, measures that deliberately display incongruent or contradictory emotion cues have been criticized as being too cognitively complex and developmentally inappropriate for preschoolers. Denham (1986) argues that such measures are not contextually valid, as they are "laden with cognitive processing demands instead of cues inherent in social exchange" (p. 195).

Early measures of affective perspective taking have also been criticized for failing to capture the attention of young children (Denham, 1986). Iannotti's (1985) measure, for example, required children to carefully listen and attend to 16 separate stories. This may have exceeded the attention capacity of many preschoolers, and as such, may underestimate their true affective perspective taking abilities.

Another important measurement issue is that true affective perspective taking is theorized to require one to be able to make inferences and reason about another's feelings, rather than respond based only on one's own feelings or typical social scripts (Denham, 1986). However, it is unclear whether several commonly used measures of emotion understanding have tapped into this ability. For example, the Emotion Situation Task, which has been used in several studies (e.g. Camras & Allison, 1985; Wismer Fries & Pollak, 2004; Camras, Perlman, Wismer Fries & Pollak, 2006), verbally presents preschoolers with short stories that describe stereotypical situations that evoke happiness, anger, sadness, or fear. An example of a story for "happiness" is "It is his/her birthday and he/she is having a party," while a story for "sadness" is "His/her mother has died." Children are then asked to identify the emotion of the character in each story by pointing to the correct facial expression from a set of four photographs. Given the multiple-choice nature of the task, responses are only scored as correct or incorrect, and as such, no information is gained about how participants approached the task or the reasoning behind their answers. It is possible for preschoolers to perform well on the task by simply relying on typical social scripts or their own feelings. Though such noninferential abilities are important early facets of emotion understanding, measures should seek to also examine more sophisticated forms of affective perspective taking.

In an effort to improve measurement of emotion understanding, Denham (1986) developed the Affective Perspective Taking test. This measure sought to be more contextualized, as it utilizes vignettes that were constructed to be age appropriate and to minimize processing demands. It also uses puppets to enact the

vignettes and embeds the assessment within play in an effort to capture children's attention. Overall, the experimenter uses puppets to enact 16 vignettes that are presented with both vocal and visual affective cues. In eight of the vignettes, the puppet is presented as feeling the way that most would feel in that situation. However, in the other eight, the puppet is portrayed as feeling the opposite of what the child's mother predicted he or she would likely feel in a questionnaire that is given prior to the assessment. Thus, some of the vignettes are more equivocal and are thought to require the child to truly infer how the puppet feels. After each vignette, children are asked whether the puppet is feeling happy, sad, angry, or afraid. They are asked to identify their answers both verbally (expressively) and nonverbally (receptively) by affixing a proper felt face onto the puppet. Responses are scored on a 3-point scale. Two points are awarded if the child chooses the correct emotion, one point is awarded if he or she chooses an incorrect emotion that is of the correct valence (positive/negative), and zero points are awarded if the child chooses an incorrect emotion of the incorrect valence. Results that Denham (1986) obtained using the Affective Perspective Taking test showed expected relationships with variables such as age and prosocial behavior and suggested that preschooler emotion understanding abilities had previously been underestimated.

Many subsequent investigations of emotion understanding have utilized Denham's (1986) measure of affective perspective taking or have adapted it in various ways. For example, studies have often altered the number of vignettes used, ranging from eight (Denham & Couchoud, 1990) to 40 vignettes (Smith & Walden, 1998). Researchers have also varied how they present the vignettes to children.

Though puppets continue to be used in many investigations, some studies also accompanied these puppet enactments with pictures corresponding to the vignettes to serve as cues or reminders (e.g. Camras et al., 2006; Cassidy et al., 2003). A study by De Rosnay and Harris (2002) took a different approach and presented situations via short videos. Some investigations have also altered the content of vignettes. While most studies used vignettes that describe emotional states invoked by external situations, one study by Flavell, Flavell, and Green (2001) focused the vignettes exclusively on emotional states invoked by internal thoughts.

Additionally, investigations frequently differ in how they score these multiple-choice affective perspective taking tasks. Several studies (e.g. Fine, Izard, & Trentacosta, 2006; Cutting & Dunn, 1999) utilize a three-point scoring method identical to the one discussed above in Denham's (1986) original study, which differentiates between erroneous answers of the correct valance and erroneous answers of the incorrect valence. However, other studies (e.g. Camras et al., 2006; Wismer Fries & Pollak, 2004) use a simplified, two-point scoring system that awards points simply based on whether the child's response is correct or incorrect.

Alternative Assessment Methods

Though multiple-choice format performance measures such as the Affective Perspective Taking test tend to dominate in investigations of emotion understanding, a few rare studies have sought to measure emotion understanding with alternative methods. For example, in a study by Denham, Zoller, and Couchoud (1994), a measure that intended to investigate how children understand the causes of emotions was used. Preschoolers were shown puppets with felt emotion faces that were

expressing happiness, anger, sadness, or fear. They were first asked to label each emotion, and if incorrect, were corrected by the experimenter until they were able to label the emotions accurately. They were then asked to give explanations for why the puppet might be feeling the particular emotion shown. Children were allowed to give several reasons for each emotion, and all responses were recorded. Responses were then scored based on the number of accurate, independent reasons given for each emotion. The works of Barrett and Capos (1987) and Stein and Jewett (1986) were used as guidelines in determining accuracy. For example, explanations of anger were scored as correct if they involved a goal being blocked.

A study by Leerkes, Paradise, O'Brien, Calkins, and Lange (2008) utilized an almost identical procedure. However, in their study, children were only allowed to give up to four explanations of why the puppet might be feeling each emotion, limiting the range of the total score from zero to 16. Thus, these measures took a more open-ended approach that focused on children's ability to list possible causes for particular emotions.

An investigation by Weimer and Guajardo (2005) also used a similar method. Preschoolers were shown emotion cards that depicted four facial expressions (happy, sad, angry, and scared) and were asked to identify each emotion. If they were unable to label the emotion, they were told the emotion and were asked again until correct. The researchers then asked the children to identify what made him/herself, a friend, his/her mother, and his/her father feel each emotion. For example, for "happy" the child was asked "What kind of things make you feel this way?", "What kind of things make your mother feel this way?", and so on. Responses were then scored according

to their adequacy on a scale ranging from 0-4, where a "0" represented a nonresponse, a "1" represented a poor response, a "2" represented an adequate response, a "3" represented a good response, and a "4" represented an excellently elaborated response. In sum, the Denham et al. (1994) and Leerkes et al. (2008) studies had children give possible emotion explanations for some hypothetical other (the puppet) and awarded scores based on the number of accurate responses given. On the other hand, Weimer and Guajardo (2005) had children give emotion explanations for known people in their lives and scored responses based on their quality rather than quantity.

Perhaps surprisingly, research using these types of measures found that they do not appear to be a strong indicator of emotion understanding. In Denham et al.'s (1994) study, scores on their "causes of emotion" task were not significantly related to age, cognitive-language ability, or maternal behaviors including use of emotion language, positive responsiveness, and negative responsiveness. The Leerkes et al. (2008) study showed similar results. Performance on the task was only weakly correlated with performance on emotion identification and affective perspective taking tasks and was not significantly related to measures of cognitive control, emotional control, early academic success, or socioemotional problems. Similarly, scores on Weimer and Guajardo's (2005) version of the task were not significantly related to performance on false belief tasks or social skills as rated by both parents and teachers. In other words, across all three studies, scores on this task type failed to exhibit relationships that would be expected based on both theory and previous research.

In contrast to the more commonly used multiple-choice format of assessing emotion understanding that present children with specific situations and scenarios, these "causes of emotion" tasks do not present examinees with a particular context. Rather, children are shown emotion facial expressions in isolation, leaving them wide latitude to create their own explanations. Thus, they are not required to take any social information or context into account when giving their causal explanations. These types of causal explanations may thus tap into children's more cognitive or scripted understandings of emotion causes, rather than their ability to truly infer how another might feel in a given situation.

Denham, Zoller, and Couchoud (1994) also utilized another alternative method of investigating emotion understanding. Preschoolers and their mothers were brought into a laboratory where they engaged in periods of free and structured play. Mothers were then instructed to look at and discuss eight photographs of infants showing facial expressions with their child. After this discussion, experimenters instructed each mother to go back to one particular picture and to act really sad in as natural a way as possible. Next, mothers went back to another picture and acted really angry. These interactions between mother and child were videotaped and transcribed. Researchers coded the transcriptions for child use of emotion language, which included explicit reference to internal states of emotions, words that referred to enjoyment or dislike (i.e. "like"), and words that referred to behavioral manifestations of emotions (i.e. "cry" or "laugh"). Proportions of children's utterances of emotion that were spontaneous explanations (i.e. "When you miss Grandma you get sad")

were then included in analyses and were intended to be a "naturalistic index of children's emotion understanding" (p. 931).

However, results again indicated that this is not a valid or feasible method for assessing emotion understanding. Denham et al. (1994) found that the proportion of utterances that contained spontaneous explanations of emotion during the task did not significantly relate to age, cognitive-language ability, or several maternal behaviors that are important to emotion understanding development. One possible explanation for this may be that mothers exhibited sad and angry emotions only because they were instructed to do so by the experimenters. The emotions were exhibited without any real context and without natural causes. Like the "causes of emotion" tasks discussed above, children were able to create any explanations for the emotion displays. Similarly, the quality of the children's explanations was not judged. Their emotion utterances were included in the analyses regardless of whether they were accurate or not. Thus, this method also fails to explicitly tap into children's ability to consider a situation when reasoning about how another might feel.

The Current Investigation

Overall, the existing methods of assessing emotion understanding are flawed. Though multiple-choice methods are used in a large majority of investigations, there are often wide differences in how such methods are implemented, structured, and scored. As previously discussed, in terms of scoring methods, many studies (e.g. Camras et al., 2006; Wismer Fries & Pollak, 2004) utilized a simplified scoring system that only awarded points if the "correct" emotion was chosen, whereas other studies (e.g. Fine, Izard, & Trentacosta, 2006; Cutting & Dunn, 1999) utilized a three-

point system that also awarded points for choosing the correct emotional valence. Given that none of the studies reviewed utilized both scoring methods concurrently, it is not clear how their differences may have impacted findings. One of the goals of the current study is thus to utilize both scoring methods and to compare their findings. No specific hypotheses are offered, as previous research has not yet investigated this area.

Additionally, many of the vignettes previously used in the multiple-choice style affective perspective taking tasks can be correctly answered by relying on one's own feelings or common social scripts, and thus they do not require children to truly reason about the feelings of another. Importantly, these methods also specify a single "correct" emotional response to each vignette *a priori*, violating the basic premise that individuals may respond differently to the same situation based on their mental states and prior experiences. For example, consider the following vignette used in the current study: "Green's parents said that they would take the family to the fair. But when it is time to go, they say that none of them can go." Typical multiple-choice methods may identify "sad" as the "correct" answer, anticipating that children are likely to view the events as a disappointing outcome. However, it is possible that children may also view the events as a violation of a promise, and thus more likely to answer "mad." This practice of specifying "correct" answers to vignettes thus ignores the fact that individuals may perceive and interpret the presented situations differently.

The alternative assessment methods have also been flawed, as they have typically required children to list potential causes of emotions without having to truly

reason about how specific situations may impact another's emotions. Despite these flaws, however, a more open-ended and qualitative approach to assessing emotion understanding may prove useful, as it may have the potential to provide more detail on how children come to understand and reason about emotions. The current investigation thus intends to combine the strengths of the commonly used multiple-choice method of assessing affective perspective abilities with more open-ended methods that analyze the quality of reasoning about emotions in specific contexts. This was accomplished by utilizing procedures similar to those often used in studies using multiple-choice measurement methods. Specifically, puppets were used to enact various social situations, and preschoolers were asked to identify whether the puppet would be feeling happy, sad, angry, afraid, or neutral in each situation. However, four of the vignettes were determined by the researchers to be more equivocal and thus likely to evoke more than one common response. For those four vignettes, children were asked to explain why the puppet might be feeling the emotion he or she chose. Thus, unlike in the alternative "causes of emotion" tasks described above, children are required to reason about the causes of emotions within a given context. Their open-ended responses were recorded and then coded on a five-point scale that reflected the quality of the child's reasoning, including how well their explanations matched both the given situation and the emotion chosen.

Hypotheses. The current study aims to examine how children's coded emotion reasoning scores compare to scores derived from the typical multiple-choice methods of affective perspective taking assessment. Overall, it is expected that examining preschooler's ability to reason about emotions in specific contexts will

provide a more nuanced understanding of their emotion understanding abilities. This will be tested through the examination of several hypotheses:

1. Although the multiple-choice methods have flaws as previously discussed, it is hypothesized that both the multiple-choice and emotion reasoning coding methods will tap into the similar underlying construct of emotion understanding. Thus, it is predicted that the emotion reasoning coded scores will exhibit significant and positive correlations with scores from multiple-choice emotion understanding tasks.
2. Similarly, it is expected that the emotion reasoning coded scores will show similar relationships with predictor and outcome variables as the multiple-choice scores.

    2A. Specifically, based on previous research (e.g. Denham et al, 1990; Pollak et al., 2000; Izard et al., 2001), it is predicted that the coded reasoning scores will exhibit significant positive correlations with age, verbal ability, and social competence.

    2B. Additionally, a majority of investigations utilizing multiple-choice affective perspective taking scores have found that they do not show significant gender differences at the preschool age (e.g. Izard et al, 2001; Trentacosta et al., 2006). Thus, it is hypothesized that emotion reasoning coded scores also will not differ significantly by gender.
3. As reviewed, although social competence and emotion understanding are related, social competence is a broader concept that consists of more than a discrete set of emotion understanding abilities (Rose-Krasnor, 1997).

Instead, social competence also requires individuals to be able to appropriately determine what abilities to use and when to use them. It is therefore expected that examining children's open-ended explanations to various social situations will provide more information as to how they perceive the connections between situations and emotions, and thus will help to clarify the connection between emotion understanding and social competence. Overall, it is hypothesized that the emotion reasoning coded scores will predict significantly more variance in social competence than the multiple-choice scores alone.

Chapter 2: Methodology

Participants

Participants were 142 children (47.5% male), ranging in age from 38 months to 82 months (M = 57.38 months, SD = 10.71 months). All participants attended the Center for Young Children (CYC) at the University of Maryland, College Park, which offers early education programs for children at the preschool and kindergarten levels. The children were largely from middle class families that were affiliated with the university in some capacity. The only basis for selection was whether parental permission was received for the child. Overall, 46% of the sample were European American, 12% African American, 12.5% Asian, 12.5% Other, and 17% were Unknown.

Procedures

Informed consent forms were disseminated to the parents of the children that attend the CYC, along with informational cover letters describing the study. Signed permission forms from either parents or guardians constituted informed consent on behalf of the child. Each child was also given the opportunity to decline participating each time they were approached to complete study tasks by a member of the research team.

Once parental consent forms were received, a graduate student researcher met individually with each child to administer measures of emotion understanding and verbal ability. Each researcher was trained on administering the measures to assure

that standard procedures were kept. If the child appeared fatigued or requested to return to class at any point, data collection was stopped and continued in a subsequent session. Additionally, measures of social competence were given to each child's classroom teacher to complete.

Measures

Emotion understanding. Emotion understanding was assessed using an adaption of the Assessment of Children's Emotional Skills (ACES; Schultz & Izard, 1998), which is a commonly used multiple-choice measure that consists of a series of tasks that measure children's perception, labeling, and matching of emotions (Izard et al, 2001; Mostow et al., 2002; Schultz, Izard, & Bear, 2004; Trentacosta & Izard, 2007). The original ACES measure was designed for use with first and second graders and includes three tasks: a) *Emotion Identification*, which requires children to identify the emotion expressed in pictures of faces; b) *Situations*, which requires children to attribute emotions to characters in described situations; and c) *Behaviors*, which requires children to attribute emotions to characters based on descriptions of behaviors. Children are asked to choose the applicable emotion from a list of five possible choices (happy, sad, mad, scared, and neutral), and total scores are calculated for each of the three tasks based on the number of correct emotions selected.

After pilot testing the ACES with preschool populations, modifications were made in order to make it more appropriate for use with preschool children. Specifically, the majority of the pictures were substituted to appear more life-like. In addition, some wording of the Situations and Behaviors vignettes were altered when necessary to make them more appropriate for younger ages, and the use of puppets

was added to aid in enacting the vignettes. The puppets looked androgynous and were named according to the color of the shirt they wore (Green, Red) in lieu of separate versions using boy and girl names. This modified version of the ACES was named the Emotion Comprehension Test (ECT).

The administration instructions for the ECT were similar to those for the original ACES. For the Emotion Identification task, children were shown pictures of 21 faces. Pictures were presented one at a time, and children had to verbally indicate the correct emotion label out of five options (happy, sad, mad, scared, and neutral). Next, 15 Situations and 15 Behaviors vignettes were enacted with the aid of puppets by the examiner. After each vignette, children were asked to choose the emotion that described how a character would feel out of the same five emotion options. After all of the multiple-choice items had been administered, the examiner returned to seven of the vignettes (four were Situations, three were Behaviors) that the researchers determined were more equivocal and thus likely to elicit differing answers. When returning to these items, the examiner stated, "That was good. Now I would like to go back to a few of these. I will read them to you again and tell you the feeling that you said. I would like you to tell me more about the feeling to help me understanding what you were thinking. Shall we try?" After re-reading the vignette, the examiner would continue by saying, "You said that Red (or Green) would feel happy/sad/mad/scared/no feeling. Why do you think Red felt (insert emotion selected)? Tell me more about Red feeling (insert emotion)." After the child provided their response, the examiner then asked, "Is there anything more you would

like to say about Red feeling (insert emotion)?" All responses to these open-ended responses were recorded verbatim.

ECT multiple-choice scores: three-point scale. As in many previous investigations assessing emotion understanding (Bassett et al., 2012; Denham, 1986; Denham et al., 1990; Dunn & Hughes, 1998; Fine, Izard, & Trentacosta, 2006; Garner, 1999; Leerkes et al., 2008; Schultz et al., 2001; Youngblade & Dunn, 1995), children's responses to the multiple-choice Emotion Identification, Situations, and Behaviors subtests were scored based on whether they chose the correct emotion and/or valence. Specifically, a three-point scale was used such that children were awarded three points for identifying the correction emotion, two points for identifying an incorrect emotion that was of the correct valence (positive or negative), and one point for providing an incorrect emotion of the incorrect valence.

ECT Situations multiple-choice scores: two-point scale. Although many previous studies have utilized the three-point scoring system, others have used two-point scales, which credit only the correct solution (Borke, 1971; Camras & Allison, 1985; Camras et al., 2006; Cassidey et al., 2003; Cutting & Dunn, 1999; Denham & Couchoud, 1990; Gnepp, McKee, & Domanic, 1987; Iannotti, 1985; Pollak et al., 2000; Reichenbach & Masters, 1983; Schultz, Izard, & Bear, 2004; Trentacosta & Izard, 2007; Wismer Fries & Pollak, 2004). In order to be able to examine the use of both scoring methods, the Situations subtest was also scored using the two-point system. As such, children were awarded one point for identifying the specific correct emotion and zero points for choosing any other emotion.

ECT ***Situations: reasoning score.*** Children's open-ended responses to the four equivocal Situations vignettes were also scored using a coding scheme that assigned numerical values to each response. The coding scheme was developed by the author and her advisor and focused on the quality of reasoning behind the given explanations. Points were assigned on a five-point scale as follows: (a) 0 = no response (e.g. the child said "I don't know"); (b) 1 = response is widely unrelated to the situation or self-contradictory; (c) 2 = response shows a slight misunderstanding of the presented situation but is congruent with the emotion chosen; (d) 3 = response is congruent with both the situation and the emotion chosen but has an imprecise explanation (e.g. the child said Green would feel sad because "Green would cry"); and (e) 4 = response is congruent with both the situation and the emotion chosen and is also well-explained. Any responses that stood out as being particularly maladaptive, unrelated, or well-explained were also flagged. A coding manual was developed that provided guidelines and examples for scoring.

After the coding system was finalized, the open-ended responses were coded by the author and another graduate student involved in the research project. In order to establish reliability, each rater first independently coded 20 random responses for each of the four items. If adequate agreement (defined as a Spearman's Rho of at least .70) was established for that item, they continued coding the rest independently. Adequate agreement was reached on the first try for all but one item, and agreement for that item was reached after coding an additional 20 random responses. Throughout the coding process, all disagreements were discussed and ultimately reconciled.

Verbal ability. Previous research has demonstrated consistent links between emotion understanding and verbal ability (e.g. Cassidy et al., 2003; Cutting & Dunn, 1999; Denham, Zoller, & Couchoud, 1994; Izard et al., 2001; Schultz et al., 2001). As such, in order to be able to control for the impact of verbal ability, each child was administered either the Receptive Vocabulary or Vocabulary subtest from the Wechsler Preschool and Primary Scale of Intelligence, Third Edition (WPPSI-III), depending on the child's age. Those under the age of four years completed the Receptive Vocabulary subtest, while those that were four years or older completed the Vocabulary subtest. The Receptive Vocabulary subtest requires children to point to pictures that best represent a word that is orally presented by the researcher, and the Vocabulary subtest requires children to define orally presented words of increasing difficulty. Both subtests have been shown to be reliable (r = .88 and .89, respectively) and highly correlated with Verbal IQ as measured by the WPPSI-III (r = .92 and .89, respectively) (Sattler, 2008).

Social competence. The Social Competence and Behavior Evaluation, Preschool Edition, Short Form (SCBE; LaFreniere & Dumas, 2003) was used to measure level of social competence and was completed by the classroom teacher for each child. The SCBE was designed to assess social competence and adjustment of children between 2.5 to 6 years of age. Example items from the scale include, "Comforts or assists another child in difficulty" and "Works easily in a group." Each item is scored on a six-point scale (1 = Almost never occurs to 6 = Almost always occurs). Normative data were obtained on over 1,200 children, and the scale has been successfully used and validated in numerous studies (e.g. LaFreniere & Dumas, 1996;

LaFreniere et al., 2002). The Social Competence subscale specifically measures levels of social integration, autonomy, and cooperation, and internal consistency ranges from .86-.90 (LaFreniere & Dumas, 1996).

Chapter 3: Results

Descriptive analyses

Table 5 presents the descriptive statistics for all variables included in the study. In addition, independent samples t-tests were run to examine any potential gender differences among all measures. As can be seen in Table 6, results revealed that there are no significant gender differences on any of the emotion understanding, verbal ability, or social competence measures. As a result, gender was not included in the remaining analyses.

Table 5

Descriptive Statistics

	Mean	Standard Deviation	Possible Range
Emotion Understanding:			
ECT: Emotion Identification MC	53.56	5.78	21 - 63
ECT: Behaviors MC	34.80	4.55	15 - 45
ECT: Situations MC	35.12	5.89	15 - 45
ECT: Situations MC - 2 points	8.29	2.85	0 - 15
ECT: Situations Reasoning	11.05	4.68	0 - 16
Verbal Ability:			
WPPSI-III Scaled Score	12.19	2.99	1 - 19
Social Competence:			
SCBE Social Competence T-Score	49.62	8.09	0 – 100

Note: MC = Multiple-Choice

Table 6

Examination of Gender Differences

	Gender		
	Male	Female	*t*
Emotion Understanding:			
ECT: Emotion Identification MC	54.07 (5.66)	53.12 (5.92)	.82
ECT: Behaviors MC	35.32 (4.33)	34.60 (4.72)	.75
ECT: Situations MC	35.21 (6.02)	35.22 (5.77)	-.01
ECT: Situations MC - 2 points	8.45 (2.87)	8.18 (2.80)	.49
ECT: Situations Reasoning	11.02 (4.07)	11.22 (4.96)	-.21
Verbal Ability:			
WPPSI-III Scaled Score	11.64 (3.26)	12.55 (2.70)	-1.47
Social Competence:			
SCBE Social Competence T-Score	49.60 (8.39)	49.65 (7.85)	-.04

Note: Scores reported are means with standard deviations in parentheses.

In addition, the frequencies at which participants selected each emotion on the ECT: Situations items were examined and are depicted in Table 7. An examination of the modal responses given to each vignette indicates that only five of the 15 items (2, 9, 10, 12, and 15) may be described as showing consensus with at least 70% of the participants choosing the same response. Three of these vignettes involve happy emotions, and two involve sadness. In three other items (1, 4, and 7), the modal response represented about half of the children (between 50 and 60%). Additionally, items 8 and 11 were marked by modal responses that represented less than 40% of participants. The remaining five items (3, 5, 6, 13, and 14) had modal responses that represented between 60 and 70% of participants.

Table 7

Frequencies of Emotions Chosen on the ECT: Situations Task (in Percentages)

Item	Happy	Sad	Mad	Scared	No Feeling
1.*	10.5	51.8	14.9	6.1	16.7
2.	75.4	5.3	0.9	7.0	11.4
3.	10.5	64.9	7.9	10.5	6.1
4.	4.4	54.4	17.5	14.0	9.6
5.	1.7	66.7	22.8	3.5	5.3
6.*	4.4	64.0	21.1	2.6	7.9
7.	4.4	51.8	30.7	2.6	10.5
8.	26.3	17.5	4.4	36.8	14.9
9.	81.6	6.1	1.7	1.7	8.8
10.	7.0	73.7	3.5	2.6	11.4
11.	5.3	22.8	27.2	26.3	18.4
12.*	6.1	74.6	4.4	6.1	8.8
13.	4.4	64.9	21.9	8.8	24.6
14.*	3.5	23.7	4.4	62.3	6.1
15.	71.9	7.9	4.4	1.7	14.0

Note: Items marked by * are those that were designated as equivocal and were followed up on for open-ended explanations

Interrater Reliability of Emotion Reasoning Coded Scores

Although any differences in codings between the two raters were discussed and ultimately reconciled, interrater reliabilities for the four vignettes judged to be equivocal were calculated on the basis of the initial independent ratings. Rater correspondences for each the four items were determined using Spearman's Rho and were .92, .86, .82, and .73, respectively.

Internal Consistency

Cronbach's alpha was used to examine the internal consistencies of the emotion reasoning coded scores and the three multiple-choice subtests of the ECT: Emotion Identification, Situations, and Behaviors (see Table 8). On the ECT:

Situations subtest, scores derived from the three-point scoring system exhibited a higher internal consistency than those derived from the two-point system, though it is not clear whether this difference is statistically significant.

Table 8

Internal Consistency of Emotion Understanding Measures

	Number of Items	Cronbach's Alpha (α)
ECT: Situations Reasoning	4	.77
ECT: Emotion Identification MC	21	.70
ECT: Situations MC	15	.80
ECT: Situations MC - 2 points	15	.69
ECT: Behaviors MC	15	.62

Correlations Between Measures

Pearson correlations were calculated to examine the relationships between the emotion understanding measures, social competence, verbal ability, and age (see Table 9). As hypothesized, the ECT: Situations Reasoning scores and the ECT: Situations Multiple-Choice scores were significantly and moderately correlated. Both scores also showed similar correlations with age and verbal ability. Lastly, the ECT: Situations Reasoning scores exhibited a stronger correlation with social competence than did the ECT: Situations Multiple-Choice scores. The multiple-choice scores from the other two subtests of the ECT (Emotion Identification and Behaviors) were not significantly correlated with social competence or verbal ability, though they were significantly correlated with age.

Additionally, the scores derived from the three-point and two-point scoring systems on the ECT: Situations subtest were highly correlated. They also showed

similar relationships with scores from the Emotion Identification and Behaviors subtests, verbal ability, and age. However, whereas the correlation between social competence and the ECT: Situations multiple-choice scores derived from the three-point system was statistically significant, $p = .035$, the correlation between social competence and the scores derived from the two-point system was only approaching significance, $p = .055$. It is important to note, though, that it is not clear whether this difference is statistically significant. However, given that the multiple-choice ECT: Situations scores resulting from the use of the three-point scoring system demonstrated stronger relationships with related constructs as well as higher internal consistency, only scores from this scoring system will be utilized in the remainder of the analyses.

Table 9

Correlations among Measures and Age

	1.	2.	3.	4.	5.	6.	7.
1. ECT: Emotion Identification MC	---						
2. ECT: Behaviors MC	.20	---					
3. ECT: Situations MC	.39***	.49***	---				
4. ECT: Situations MC - 2 points	.35***	.48***	.96***	---			
5. ECT: Situations Reasoning	.27**	.36***	.66***	.62***	---		
6. WPPSI-III Scaled Score	.14	.06	.34***	.32**	.35**	---	
7. SCBE Social Competence T-Score	.07	.15	.23*	.20	.40***	.15	---
8. Age	.31**	.39***	.35***	.37***	.34**	.21*	-.05

*p < .05, **p < .01, ***p < .001 (2-tailed)

Additionally, partial correlations were utilized to examine how both the ECT: Situations Reasoning and ECT: Situations Multiple-Choice scores correlate with social competence when the effects of age and verbal ability are controlled. Results

reveal that whereas the ECT: Situations Reasoning scores remain significantly correlated with social competence when the effects of age and verbal ability are held constant, $r(73) = .43$, $p < .001$, the ECT: Situations Multiple-Choice scores do not, $r(73) = .16$, $p = .18$.

Multiple Regression Analyses

In order to determine whether the ECT: Situations Reasoning scores predict significantly more variance in teacher-rated social competence than ECT: Situations Multiple-Choice scores, a hierarchical multiple regression analysis was performed (see Table 10). In the first step of the regression, age and verbal ability were entered as predictors of social competence. Variables from this step of the regression accounted for approximately 2% of the variance in social competence, and the overall model was insignificant. Neither age nor verbal ability was a significant predictor of social competence.

The ECT: Situations Multiple-Choice score was then added in at the second step of the regression. The ECT: Situations Multiple-Choice scores accounted for approximately an additional 5% of the variance in social competence, though the overall model remained insignificant.

Lastly, the ECT: Situations Reasoning score was added in at the third step of the regression. This score accounted for an additional 13% of the variance in social competence, which was a significant increase and brought the model to significance. Overall, the model accounted for approximately 20% of the variance in social competence, with ECT: Situations Reasoning being the only significant individual predictor.

Table 10

Multiple Regression: Age, Verbal Ability, ECT: Situations Multiple-Choice, and ECT: Situations Reasoning as Predictors of Teacher-Rated Social Competence

				Overall			
	β	*B*	*t*	ΔR^2	R^2	*F*	*df*
First block				.02	.02	.88	2, 81
Age	.02	.01	0.15				
WPPSI-III Scaled Score	.14	.38	1.26				
Second block				.05*	.07	1.99	3, 80
Age	.13	.10	1.07				
WPPSI-III Scaled Score	.03	.08	0.23				
ECT: Situations MC	.26	.36	2.04*				
Third block				.13***	.20	4.95***	4, 79
Age	.24	.18	1.99				
WPPSI-III Scaled Score	-.08	-.23	-0.70				
ECT: Situations MC	.00	.00	0.01				
ECT: Situations Reasoning	.51	.88	3.60**				

*p < .05, **p < .01, ***p < .001

Chapter 4: Discussion

A large majority of investigations that have examined emotion understanding in preschool populations typically have utilized multiple-choice assessment methods that have been structured, implemented, and scored in a variety of ways. One of the main goals of the current study was thus to examine the use of two different scoring methods that have commonly been utilized on emotion understanding tasks. Additionally, although a few studies have attempted to measure emotion understanding via more open-ended methods, results from such studies have failed to show expected relationships. As such, the main goal of the current study was to examine an alternative method of emotion understanding assessment that combines the strengths of the commonly used multiple-choice measures with the unique information that can be obtained from open-ended methods. This was accomplished by asking participants to explain their multiple-choice responses on four vignettes considered to be equivocal. These open-ended responses were subsequently coded for their quality of reasoning. The implications of the results for this measure are discussed below, as well as potential limitations and directions for further investigations.

Comparing Scoring Systems

In the emotion understanding field, researchers have scored performance on multiple-choice style emotion understanding assessments in one of two ways: they either utilized a two-point scoring system that awards points only when the specific correct emotion is chosen, or they utilized a three-point system that awards partial

points if an emotion of the correct valence is chosen. Although both methods are widely used in the literature, no known studies have compared their use concurrently. As such, it is unclear how results from the use of the different scoring systems may have been impacted.

In order to clarify this issue, the present study utilized both systems to score performance on a multiple-choice affective perspective taking measure, the ECT: Situations subtest. Although scores from both systems were very strongly correlated, the three-point scoring system demonstrated greater internal consistency and marginally more robust correlations with related constructs. The results suggest that the three-point system may have a slight edge over the two-point system, but the methods and analyses utilized in this investigation were not able to determine whether these differences are statistically significant. Therefore, evidence in this domain remains inconclusive.

Interrater Reliability and Internal Consistency of Open-Ended Method

As mentioned, this study aimed to improve the measurement of emotion understanding, and thus proposed a new method of assessment that relies on the coding of open-ended responses. The coding scheme proposed in the current study utilizes a five-point scale that is intended to reflect the underlying quality of reasoning inherent in children's open-ended explanations. However, whenever a coding system is used, it is essential that independent raters be able to implement the system reliably and consistently. To investigate this, two independent raters coded all open-ended responses received on the four vignettes of the ECT Situations subtest that were judged to be equivocal. Although all ratings were ultimately reconciled

between the two raters, interrater reliabilities for the four vignettes were calculated on the basis of the initial independent ratings. According to Chichetti and Sparrow (1981), interrater reliability values above .70 are generally considered acceptable for use in applied tests. The interrater reliabilities were above this standard for all four vignettes, suggesting that the proposed coding system is able to be used reliably among raters.

In addition, the internal consistency of the emotion reasoning scores and the three ECT subtest scores (Emotion Identification, Situations, and Behaviors) were examined. A Cronbach's alpha of .70 or higher is typically considered to be acceptable when using measures to assess and make decisions about individuals (Pedhazur & Schmelkin, 1991), although lower values may be considered adequate when used for research purposes. Using this guideline, the internal consistency of the coded emotion reasoning scores are considered acceptable for applied use. Internal consistency scores for the ECT Emotion Identification and the ECT Situations subtests also fell within the acceptable range. However, the ECT Behaviors subtest yielded a Cronbach's alpha slightly below .70, and thus this subtest may be inadequate for applied use and individual decision making.

Establishing Evidence of Validity

In order for this new method of assessing emotion understanding to be useful, it is also imperative that it actually measure the construct of emotion understanding as intended. As such, one of the main goals of the current study was to begin to establish evidence for the method's construct validity. This was accomplished by

examining relationships with predictor and outcome variables, as well as findings from a multiple regression analysis.

Relationships among emotion understanding assessment methods. Firstly, it was hypothesized that the emotion reasoning scores derived from this newly proposed alternative method of emotion understanding assessment would be positively correlated with scores derived from typical multiple-choice emotion understanding assessments. Indeed, support for this hypothesis was found. The emotion reasoning coded scores exhibited a significant and strong, positive relationship with the multiple-choice scores from a multiple-choice affective perspective taking task, the ECT Situations subtest. The emotion reasoning scores also were significantly and moderately correlated with the multiple-choice scores from the ECT Emotion Identification and ECT Behavior subtests. These correlations between measures suggest that the emotion reasoning coded scores and the three ECT multiple-choice subtests tap into similar and related aspects of the emotion understanding construct.

Relationships with predictor variables. It was also hypothesized that the emotion reasoning coded scores and the ECT multiple-choice scores would display relationships with various predictor variables that are consistent with both theory and previous investigations. According to theory, emotion understanding develops as children grow older and have increased opportunities to participate in social interactions (Smith & Walden, 1998). Thus, older children are expected to outperform younger children on emotion understanding assessments. Consistent with this, results from the current study revealed that scores from all three of the ECT

subtests were significantly and moderately correlated with age, as were the coded emotion reasoning scores.

Additionally, the role that gender plays in emotion understanding was also examined. Theory has not predicted a link between gender and emotion understanding at the preschool age, and as previously discussed, a vast majority of the studies reviewed did not find any significant gender differences on emotion understanding assessments at this age (e.g. Izard et al, 2001; Trentacosta et al., 2006). In the few studies that did find significant gender differences, the findings tended to only be found on specific subtests or were inconsistent, with findings occurring in opposite directions (Ontai & Thompson, 2002). Overall, theory and evidence suggests that gender is not significantly correlated with emotion understanding at the preschool age. Findings from the current study support this conclusion, as performance did not differ significantly by gender on any of the three ECT subtests or on the emotion reasoning coded scores. However, it is possible that gender plays a more significant role in the development of emotion understanding as children grow older and become more socialized into their respective genders. For example, studies have found differences in the use of emotion regulation strategies between men and women in adulthood (Nolen-Hoeksema, 2012).

In addition to age, it is also well accepted that verbal ability plays an important role in the development and measurement of emotion understanding, and many of the studies reviewed revealed significant relationships between the two (e.g. Fine et al., 2003; Schultz et al., 2001). It is thought that children with greater verbal abilities have a better grasp of emotion vocabulary, which, in turn, enhances their

acquisition of emotion knowledge and social skills. Additionally, since emotion understanding assessments often require children to listen to short stories or vignettes, verbal ability may impact how well they are able to comprehend and respond to items. Indeed, findings from the current study reveal significant positive and moderate relationships between verbal ability and multiple-choice scores from the ECT Situations subtest, as well as between verbal ability and emotion reasoning coded scores. In contrast, no significant relationship between verbal ability and performance on the ECT Emotion Identification subtest was found. This pattern may be explained by the fact that the Emotion Identification subtest primarily relies on the use of pictures and thus minimizes the need for verbal comprehension.

Overall, the various emotion understanding scores examined in this study exhibited significant and moderate relationships with age and verbal ability and did not differ based on gender, as was expected given both theory and previous research. Additionally, the patterns of relationships with these predictor variables were comparable for both the coded emotion reasoning scores and the multiple-choice derived scores. These similar results begin to provide support for the notion that the newly proposed coded emotion reasoning scores tap into the same underlying construct measured by the common multiple-choice affect perspective taking methods.

Relationships with outcome variables. According to Rose-Krasnor's (1997) prism model of social competence, certain skills, including those encompassed by emotion understanding, act as building blocks for social competence. Thus, when children possess these skills, they are "more likely to attain success in social

competence measures" (p. 123). As discussed, previous investigations have supported this notion and have consistently illustrated significant relations between emotion understanding and social competence, as well as between emotion understanding and other constructs closely related to social competence, such as prosocial behavior, social skills, and social problem solving skills (see Table 1). Thus, it was hypothesized that the emotion understanding measures utilized in the current study would exhibit significant positive relationships with a teacher-rated measure of social competence.

Results revealed that both the emotion reasoning coded scores and the multiple-choice scores from the ECT Situations subtest were significantly correlated with overall teacher-rated social competence, as expected. However, given that both age and verbal ability were significantly correlated with performance on these emotion understanding measures, partial correlations were utilized to examine whether they would continue to correlate with social competence once the effects of age and verbal ability were controlled. Although the emotion reasoning coded scores remained significantly correlated with the teacher-rated social competence measure, the correlation between the multiple-choice scores and social competence was reduced to insignificance. This suggests that the multiple-choice scores may not contribute significantly to the variance in social competence beyond what is already captured by the effects of age and verbal ability.

In addition, the multiple choice scores from the ECT Emotion Identification subtest did not show a significant relationship with social competence. This finding is consistent with those from studies conducted by Denham et al. (1990) and Garner

(1999), who also found that scores from affective perspective taking tasks were significantly related to social competence-related outcomes at preschool ages, whereas scores on emotion identification tasks were not. Together, these findings provide support for Bassett et al.'s (2012) argument that emotion understanding develops in a hierarchical fashion, with later skills building upon earlier ones. The evidence suggests that children of preschool-age already possess strong emotion identification skills. In contrast, their abilities to understand which emotions are likely to be elicited by various situations are beginning to emerge at this time in their development, and it is their abilities in this domain that significantly correlate with social competence.

Interestingly, multiple choice scores from the ECT Behaviors subtest also did not significantly correlate with social competence. This finding may also be explained by the hierarchical nature of emotion understanding development. Whereas the vignettes from the ECT Situations subtests describe the contexts of various social situations, those from the ECT Behaviors subtest focus on describing specific behaviors. Successful performance on this subtest may thus require more knowledge of emotion display rules, and according to the theoretical models of emotion knowledge development proposed by both Denham (1998) and Pons et al. (2004), such knowledge does not develop until later in childhood. It appears, then, that preschool-age children do not yet exhibit meaningful individual differences on the ECT Behaviors subtest, though that may change as development progresses. Alternatively, it may be that the Behaviors subtest fails to measure the emotion understanding construct as intended.

Predicting social competence. Lastly, it was hypothesized that the emotion reasoning coded scores would not only act similarly to scores derived from multiple-choice methods, but that they would provide a stronger and more nuanced understanding of emotion understanding. Whereas the multiple-choice scores may tap into discrete and scripted aspects of emotion understanding, it is thought that the coded reasoning scores would provide insight into how children perceive the connection between situations and emotions. Therefore, these scores may offer a more accurate representation of how children utilize their emotion understanding skills in real world interactions. Specifically, it was predicted that the emotion reasoning scores would predict significantly more variance in social competence than the multiple-choice scores alone.

In order to examine this hypothesis, a hierarchical multiple regression analysis was performed. Results revealed that age, verbal ability, and the multiple-choice scores from the ECT Situations subtest together did not account for a significant amount of the variance in teacher-rated social competence. However, when the emotion reasoning coded scores were added, the regression model became significant. The emotion reasoning scores contributed significantly to the model, which overall accounted for approximately 20% of the variance in teacher-rated social competence. Additionally, the emotion reasoning scores were the only significant individual predictor within the model. Together, these results suggest that the coded emotion reasoning scores provide unique and useful information beyond what is provided by the typical multiple-choice assessment methods.

Taken together, these findings begin to provide support for the validity of this alternative method to emotion understanding assessment. The emotion reasoning scores proposed in this study have demonstrated similar relationships with predictor variables as scores derived from multiple-choice assessments, suggesting that they both tap into the underlying construct of emotion understanding. Additionally, the emotion reasoning scores predict more variance in outcomes such as social competence. This suggests that these scores provide unique and useful information beyond what is provided when using typical multiple-choice emotion understanding assessments. It is also important to note that, although this alternative method may appear to be cumbersome or time-consuming, open-ended responses are only requested and coded for a small subset of items. Thus, once the coding system is learned, the additional administration time is minimal, and the tradeoff for the more nuanced understanding of emotion understanding abilities is likely to be worthwhile.

Limitations and Future Directions

A large strength of the current study is that the alternative method of assessing emotion understanding proposed takes a new approach by examining how preschoolers reason about emotions and how they fit within particular contexts. This approach provides researchers and examiners with unique and valuable information about children's emotion understanding abilities and also helps to clarify the link between emotion understanding and social competence. Beyond simply identifying an emotion likely to be elicited by a situation, results suggest that it is particularly important for children to understand the connection between situations and the emotions they may elicit.

Despite this strength, there are also several limitations to the current study. As previously discussed, the multiple-choice methods of assessing emotion understanding present children with various vignettes describing social situations and require them to identify how a character in each vignette would feel out of a set of several given options. One of the shortcomings of this method is that "correct" answers to each vignette are designated *a priori*. This practice ignores the fact that one's unique mental state and previous experiences are likely to influence how situations are perceived and rather assumes that most children will react the same way to the given situations. This assumption has generally gone unexamined. However, results from the current study reveal that the modal response given represented 70% or more of the participants on only five of the fifteen vignettes. On several of the vignettes, responses were split across two or more emotions. Thus, it appears preschoolers do not perceive and react to situations as uniformly as assumed.

Similarly, results indicate that some of the four vignettes that were identified *a priori* by the research team as being more equivocal and that were followed up on for the open-ended responses are not as equivocal as originally assumed. For example, Item 17 was one of the four items judged to be equivocal, but results indicate that the modal response for that item represent the second highest percentage of participants at almost 75-percent. Additionally, results revealed that the two items that exhibited the greatest variation in responses (8 and 11) were not among the four judged to be equivocal. Given these patterns of findings, it is clear that multiple-choice methods that pre-determine which answers are "correct" are likely to fail to pick up on valuable information about how preschoolers perceive and react to situations. It also

indicates that the four vignettes judged to be equivocal in the current investigation may not be the most useful subset of items to follow-up on for open-ended responses. It is possible that following-up on different subset of items may provide even more useful information about preschooler's emotion understanding abilities. Future research would benefit from examining this possibility.

In addition, although the development of this alternative method of assessing emotion understanding is based on a theoretical framework and draws upon techniques that are already commonly used in the field, construct validity still remains a concern. Links between the coded emotion reasoning scores and age, gender, verbal ability, and social competence have produced theoretically expected results. However, future research on the validity of this measure is still needed and may be accomplished by examining its relationships with other theoretically-related predictor and outcome variables.

Another limitation of the current study is the high language ability of the sample. Given that the verbal abilities of the sample were generally advanced, the relationships between verbal ability and the other measures may have been underestimated. Similarly, although the sample was ethnically diverse, most participants came from well-educated and relatively affluent families, and thus the sample was socio-economically homogenous. At this point, it is unclear how the findings from the current investigation would generalize to other populations.

Appendix 1

Table 1

Summary of Studies Investigating Emotion Understanding (EU)

Study	Sample Age (years)	Sample Size	Sample Characteristics	Predictors of EU*	EU Outcomes*	Other Related Factors*
Bassett, Denham, Mincic, & Graling (2012)	M=4.1	N = 324	Recruited from Head Start and private child care centers. Racially and economically diverse.	n/a	**Competence motivation** Teacher ratings (PLBS) r=.17, p<.01 **Attention/persistence** Teacher ratings (PLBS) r=.14, p<.05 **Sensitivity/ Cooperativeness** Teacher ratings (PLBS) r=.18, p<.01	n/a
Cassidy, Werner, Rourke, Zubernis, & Balaraman (2003)	M=4.3, R=3-5.5	N = 76	Recruited from middle- and working-class suburbs	**Language ability** Test of Early Language Development-2 r=.53, p<.001 **Cognitive**	**Social skills** Teacher ratings (SSRS) r=.32, p<.01 **Spontaneous prosocial behaviors** Classroom observation	Age

				understanding False belief & Deception tasks r=.34, p<.005	r=27, p<..01	
Cutting & Dunn (1999)	M=4.2, R=3.5-4.8	N = 128	From England. Racially and economically diverse.	**Theory of mind** False belief tasks r=.44, p<.01 **Verbal ability** British Picture Vocabulary Scale r=.33, p<.01 **Mother's education** r=.41, p<.01 **Parent occupational class** r=.30, p<.01 **Family structure** r=.22, p<.01	n/a	Age
De Rosnay & Harris (2002)	M=5, R=3.5-6.3	N = 51	From England. Economically diverse.	**Secure attachment** Separation Anxiety Test r=.37, p<.01 **Self-reliance** Separation Anxiety Test	n/a	Age, verbal ability

				r=.40, p<.01		
Denham (1986)	R=2-4	N = 27	From rural community	**Cognitive perspective taking** False belief task r=.55, p<.02	**Prosocial behavior** Structured observations r=.51, p<.02	
Denham, McKinley, Couchoud, & Holt (1990)	M=3.7, R=2.8-4.7	N = 65	Recruited from university laboratory preschool	n/a	**Likability** Peer sociometric ratings r=.33, p<.05	Age
Denham, Zoller, & Couchoud (1994)	M=3.5	N = 47	Predominantly Caucasian and from middle- to upper-middle class families.	**Cognitive-language ability** MacArthur Communicative Development Inventory r=.35, p<.05 **Maternal emotion language** Laboratory observation r=.38, p<.001 **Maternal negative responsiveness** Laboratory	n/a	Age

				observation r=-.27, p<.001 **Maternal positive responsiveness** Laboratory observation r=.43, p<.001		
Fine, Izard, & Trentacosta (2006)	M=4.9, R=3.6-5.6	N = 214	Recruited from Head Start. Racially and economically diverse.	**Behavioral control** Behavioral Style Questionnaire r=.34, p<.01	n/a	n/a
Hughes & Dunn (1998)	M=3.9, R=3.25-4.5	N = 50	Recruited from inner-city nursery schools. Racially and economically diverse.	**Theory of mind** False belief & Deception tasks r=.39, p<.01	**Sociocognitive skills** Laboratory observations of dyadic play with friends r=.33, p<.05	Age
Iannotti (1985)	M= 4.9, R=4.3-5.5	N = 52	Predominantly white from middle-class homes	n/a	**Spontaneous prosocial behaviors** Classroom observation r=.29, p<.01	n/a

Izard, Fine, Schultz, Mostow, Ackerman, & Youngstrom (2001)	Tested at ages 5 and 9	N = 72	Head Start – economically disadvantaged & racially diverse	**Verbal ability** PPVT-R r=.61, p<.01	**Academic competence** Teacher ratings (SSRS) r=.43, p<.01 **Cooperation** Teacher ratings (SSRS) r=.36, p<.01 **Internalizing problems** Teacher ratings (SSRS) r=-.22, p<.05	n/a
Leerkes, Paradise, O'Brien, Calkins, & Lange (2008)	M=3.5	N = 141	Racially, economically, and educationally diverse	**False belief reasoning** Unexpected contents task r=.18, p<.05 **Lability/Negativity** CBQ-Short r=-.17, p<.05 **Cognitive control** Children's Strop Test r=.25, p<.01	**Academic competence** WJ-III Letter Identification Subtest r=.30, p<.01 WJ-III Applied Problems Subtest r=.51, p<.01	n/a

Pollak, Cicchetti, Hormung, & Reed (2000)	R=3-5.5	N = 48	Physically neglected (n=17), physically abused (n=16), nonmaltreated (n=15)	**Maltreatment status** Nonmaltreated, physically abused, or neglected F(2,47)=3.80, p<.05	n/a	Age, vocabulary
Reichenbach & Masters (1983)	4 year olds and third graders	N = 128	Half from intact families, half from disrupted families. Diverse SES status.	**Family status** Intact or Disrupted F(2,360)=5.02, p<.002	n/a	Age
Schultz, Izard, & Bear (2004)	First and second graders, M=7.7	N=182	From rural, predominantly middle-class community	**Happiness** Peer nominations r=.19, p<.01	**Aggression** Teacher Observation of Classroom Adaptation-Revised r=-.16, p<.05	Gender, age

Schultz, Izard, Ackerman, & Youngstrom (2001)	R=3.5-7.5	N = 143	Head Start – economically disadvantaged & racially diverse	**Verbal ability** PPVT-R r=.29, p<.01 **Attentional control** CBCL Preschool Teacher Report Form r=.35, p<.01 **Behavioral control** Behavioral Styles Questionnaire r=.31, p<.01	**Social problems** CBCL Preschool Teacher Report Form r=-.32, p<.01 **Social withdrawal** CBCL Preschool Teacher Report Form r=-.37, p<.01	n/a
Smith & Walden (1998)	M=4.5, R=3.3-6	N = 45	All African American. Many from disadvantaged homes.	**Maternal education** r=.38, p<.01 **Income** r=.44, p<.01 **Cognitive language skills** PPVT-R r=.46, p<.01	**Social problem solving** Preschool Interpersonal Problem Solving Inventory r=.45, p<.001	Age
Southam-Gerow & Kendall (2000)	M=11.5 R=7.5-14	N = 17	Clinical sample with anxiety disorders	n/a	**Internalizing problems** CBCL r=-.47, p<.05 **Anxiety/Depression**	n/a

					CBCL r=-.43, p<.05	
Trentacosta & Izard (2007)	M=6 at first testing	N=142	Recruited from schools in urban areas. Predominantly African American sample.	**Verbal ability** PPVT-III r=.47, p<.01 **Attention** Observer ratings during test session r=.23, p<.01	**Emotion regulation** Teacher ratings (Emotion Regulation Checklist) r=.22, p<.01 **Academic achievement** WIAT-II-A r=.35, p<.01	Age
Wismer Fries & Pollak (2004)	M=4.5	N = 39	Children adopted from Romanian and Russian orphanages (n=18) and children residing with biological parents (n=21)	**Length of time in institutionalization setting before adoption** r=-.27, p<.05	n/a	Age
Youngblade & Dunn (1995)	Not reported	N = 50	All Caucasian	**Use of pretend play** Home observations r=.28, p<.05	n/a	

*All three categories represent factors that were correlated with emotion understanding. Since a large majority of the studies were correlational and not causal in nature, the true direction of their relationship cannot be established. However, the nature of their relationships as illustrated in this table (i.e. predictors or outcomes of EU) are based on conceptualizations of the original study authors.

**All correlations included are between the factor specified and emotion understanding, represented by either an aggregate emotion understanding score or for the affective perspective taking/emotion situation knowledge subtest if specified.

Appendix 2

Table 2

Definitions of Emotion Understanding and Related Terms

Study	Terms Used	Definition
Bassett, Denham, Mincic, & Graling (2012)	Emotion knowledge	"Understanding one's own and other's emotions" (p. 259)
Borke (1971)	Empathy	Taking another's point of view
Camras, Perlman, Wismer Fries & Pollak (2006)	Emotion knowledge	"Capacity to perceive and understand others' emotions based on information from a variety of sources including emotional facial expressions" (p. 193)
Cassidy, Werner, Rourke, Zubernis, & Balaraman (2003)	Emotion understanding	"The ability to understand another's emotional state based on a given situation in the world, perhaps better described as emotional sensitivity" (p. 199)
Cutting & Dunn (1999)	Emotion understanding	Understanding of the links between particular situations and emotions
De Rosnay & Harris (2002)	Emotion understanding	Attributing emotions to another
Denham (1986)	Affective perspective taking	Making "an inference about another's feelings" (p. 195)
Denham, McKinley, Couchoud, &	Emotion knowledge	"ability to interpret others' emotions" (p. 1145)

Holt (1990)		
Denham, Zoller, & Couchoud (1994)	Emotion understanding	“Comprehension of emotions’ expressions and situations and the ability to converse about the causes for emotions” (p. 928)
Fine, Izard, & Trentacosta (2006)	Emotion situation knowledge	“The ability to infer other’s emotions from situational cues” (p. 730)
Hughes & Dunn (1998)	Emotion understanding	Involves the abilities to label facial expressions, to identify emotions based on situations, and to understand mixed emotions
Iannotti (1985)	Empathy	Requires an emotional response; involves understanding another’s thoughts, feelings, and motives
Izard, Fine, Schultz, Mostow, Ackerman, & Youngstrom (2001)	Emotion knowledge	“component of emotional intelligence;” “provides the foundation for emotion communication and social relationships” (p. 18)
Leerkes, Paradise, O’Brien, Calkins, & Lange (2008)	Emotion understanding	“The ability to recognize and label one’s own and others’ emotions, tie them to situations, understand their causes, identify familial and cultural display rules, and recognize disparity between emotional displays and felt emotions” (p. 105)
Pollak, Cicchetti, Hormung, & Reed (2000)	Emotion recognition	The ability to identify emotions from both facial and contextual cues
Reichenbach & Masters (1983)	Understanding of emotions	Judging another’s emotional state
Schultz, Izard, & Bear (2004)	Emotion attribution accuracy	How children perceive and encode emotion signals

Schultz, Izard, Ackerman, & Youngstrom (2001)	Emotion knowledge	Appraising and processing emotional stimuli
Smith & Walden (1998)	Emotion understanding	"Comprehension of emotions," involving skills such as "recognition of facial expressions, understanding of which emotions are appropriate in particular contexts, empathy for others' feelings" (p. 179)
Southam-Gerow & Kendall (2000)	Emotion understanding	"People's knowledge about their feelings" (p. 319)
Trentacosta & Izard (2007)	Emotion knowledge	Includes "sophisticated abilities such as the understanding of display rules and knowledge of the causes and consequences of emotion expressions … the ability to accurately perceive and label facial expressions and situational and behavioral emotion cues" (p. 77)
Weimer & Guajardo (2005)	Emotion understanding	Understanding the causes and consequences of emotions
Wismer Fries & Pollak (2004)	Emotion understanding	Inferring another's emotional state
Youngblade & Dunn (1995)	Emotion understanding	"Understanding the situational causes of another's emotions" (p. 1486)

Appendix 3

Table 3

Theoretical Models of the Development of Emotion Knowledge

Skill Area	Denham (1998) Model	Pons et al. (2004) Model	Approximate Ages of Development
Recognizing and naming emotions based on facial expressions	Level 1	Level 1	2-4 years
Identifying emotion-eliciting situations	Stereotypical: Level 2 Nonstereotypical: Level 5	Level 2	3-6 years
Inferring the causes and consequences of emotions	Level 3	n/a	3-6 years
Using emotion language	Level 4	n/a	3-6 years
Understanding desire-based emotions	n/a	Level 3	3-5 years
Understanding belief-based emotions	n/a	Level 4	4-6 years
Understanding the relation between memory and emotion	n/a	Level 5	3-6 years
Use of emotion regulation strategies	Level 6	Level 6	5+ years
Developing knowledge about display rules	Level 7	Level 7	4-6 years
Developing knowledge about mixed emotions	Level 8	Level 8	8+ years
Developing social and moral emotions	Level 9	Level 9	8+ years

Appendix 4

Table 4

Assessment of Affective Perspective Taking: Multiple-Choice Methods

Study	Number of Vignettes	Presentation of Vignettes	Response Modality	Emotions Included	Scoring Method	Other Notes
Bassett, Denham, Mincic, & Graling (2012)	20	Presented verbally by examiner with puppets (using vocal and facial cues)	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	3 point scale – credit given for correct valence	In 8 of the vignettes, the puppet exhibited typical response. In the other 12, the puppet exhibited a response that was different than what the child's mother predicted the child would feel.
Borke (1971)	7	Presented verbally by examiner with accompanying	Child must point to drawings of facial expressions.	Happiness, sadness, anger, fear	Correct or incorrect	

		picture that did not show the main character's facial expression				
Camras & Allison (1985)	12	Presented verbally by examiner with accompanying line drawing that did not show the main character's facial expression	In half, child must provide a verbal label. In other half, must point to black and white photographs of facial expressions.	Happiness, sadness, anger, fear, disgust, surprise	Correct or incorrect	
Camras, Perlman, Wismer Fries & Pollak (2006)	32	Presented verbally by automated adult voices through a computer with accompanying color illustrations that did not show character's facial expressions	Child must point to photographs on a touch screen computer	Happiness, sadness, anger, fear	Correct or incorrect	
Cassidy, Werner, Rourke, Zubernis, & Balaraman (2003)	8	Presented verbally by examiner with puppets and	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	Correct or incorrect	Included stories in which the puppet experienced emotions similar to

		accompanying picture				what a typical child would experience in the situation and instances in which the puppet experienced atypical response
Cutting & Dunn (1999)	16	Presented verbally by examiner with puppets (using vocal and facial cues)	Child could provide a verbal label or affix a felt face to the puppet	Happiness, sadness, anger, fear	Correct or incorrect	In half the vignettes, the puppet exhibited typical response. In the other half, the puppet exhibited a response that was different than what the child's mother predicted the child would feel.
Denham (1986)	14	Presented verbally by examiner with puppets (using vocal and facial cues)	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	3 point scale – credit given for correct valence	In 8 of the vignettes, the puppet exhibited typical response. In the other 6, the puppet exhibited a response that was different than what

						the child's mother predicted the child would feel.
Denham & Couchoud (1990)	8	Presented verbally by examiner with puppets (using vocal and facial cues)	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	Correct or incorrect	
Denham, McKinley, Couchoud, & Holt (1990)	20	Presented verbally by examiner with puppets (using vocal and facial cues)	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	3 point scale – credit given for correct valence	In some of the vignettes, the puppet exhibited typical response. In others, the puppet exhibited a response that was different than what the child's mother predicted the child would feel.
Dunn & Hughes (1998)	16	Presented verbally by examiner with puppets (using vocal and facial cues)	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	3 point scale – credit given for correct valence	

Fine, Izard, & Trentacosta (2006)	18	Presented verbally by examiner	Child must provide a verbal label	Joy, interest, sadness, anger, fear, shame	3 point scale – credit given for correct valence	
Garner (1999)	10	Presented verbally through audio tape with accompanying drawing that did not show characters' facial expressions. No vocal cues of emotion were provided.	Child must point to drawings of faces.	Happiness, sadness, anger, fear	3 point scale – credit given for correct valence	Vignettes designed to be unequivocal
Gnepp, McKee, Domanic (1987)	14	Presented verbally by examiner	Child must point to drawings of faces. Also must point to drawings to indicate whether "almost everybody" feels that way or "some kids do and some kids don't."	Happiness, sadness, fear	Correct or incorrect	8 situations were designed to be equivocal, other 6 designed to be unequivocal.
Iannotti (1985)	16	Presented verbally by examiner with	Child must point to line drawings of faces	Happiness, sadness, anger, fear	Congruent items scored as correct or	In half the vignettes, the emotional

		accompanying picture			incorrect. Incongruent items scored as following either situational or affective cues.	expression of the character was congruent with the situation, and in the other half was incongruent.
Leerkes, Paradise, O'Brien, Calkins, & Lange (2008)	17	Presented verbally by examiner with puppets	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	3 point scale – credit given for correct valence	Four vignettes described nonequivocal situations,
Pollak, Cicchetti, Hormung, & Reed (2000)	25	Presented verbally by examiner	Child must point to black and white photographs of facial expressions	Happiness, sadness, anger, fear, disgust	Correct or incorrect	
Reichenbach & Masters (1983)	32	Presented verbally by examiner along with a picture of the main character's facial expression	Child must provide a verbal label	Happiness, sadness, anger, neutral	Correct or incorrect	Vignettes and facial expression pictures were paired in every possible combination such that many were inconsistent
Schultz, Izard, & Bear (2004)	15	Presented verbally by examiner	Child must provide a verbal label	Happiness, sadness, anger, fear, no feeling	Correct or incorrect	
Schultz, Izard, Ackerman, &	18	Presented verbally by	Child must provide a verbal label	Joy, interest, sadness, anger,	3 point scale – credit given for	

Youngstrom (2001) Smith & Walden (1998)		examiner		fear, shame	correct valence	
Trentacosta & Izard (2007)	15	Presented verbally by examiner	Child must provide a verbal label	Happiness, sadness, anger, fear, neutral	Correct or incorrect	Twelve of the vignettes described prototypical situations related to the emotions, and three described more ambiguous situations
Wismer Fries & Pollak (2004)	32	Presented verbally by automated adult voices through a computer with accompanying color illustrations that did not show character's facial expressions	Child must point to photographs on a touch screen computer	Happiness, sadness, anger, fear	Correct or incorrect	

Youngblade & Dunn (1995)	16	Presented verbally by examiner with puppets (using vocal and facial cues)	Child must affix felt faces to the puppet	Happiness, sadness, anger, fear	3 point scale – credit given for correct valence	In half of the vignettes, the puppet exhibited typical response. In the other half, the puppet exhibited a response that was different than what the child's mother predicted the child would feel.

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