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Low-income preschoolers' expressive and situational emotion knowledge

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**Barbosa de Sa,
Aline**

**Low-income
Preschoolers'
Expressive and
Situational Emotion
Knowledge**

September 2008

Low-income Preschoolers' Expressive and Situational Emotion Knowledge

by

Aline Barbosa de Sa

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This thesis is accepted and approved in partial fulfillment of the requirements for the Master of Science

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Abstract

This study examined low-income children's understanding of basic emotions (happy, sad, angry, scared, and surprised) through their expressive (recognition and labeling of emotions) and situational emotion knowledge (causes and consequences of emotions). It also examined the order of acquisition across these four emotion understanding abilities to see whether they developed in a linear fashion. A total of 130 3- to 4-year-olds (50 3-year-olds and 80 4-year-olds) were tested with an emotion understanding task toward the beginning (October/November) and toward the end of the school year (May), providing us with both cross-sectional and longitudinal data. The results indicated that overall, children were able to recognize and label happy better than any other emotion, and surprise the least. We also found that 4-year-olds' ability to recognize and label these five basic emotion expressions was better than that of 3-year-olds, and that children's ability to recognize and label emotion expressions increased from fall to spring for both age groups. In terms of situational emotion knowledge, children provided more appropriate causes and consequences for scared and happy than for sad and angry, and the least for surprise. Four-year-olds were more adept to providing causes and consequences than 3-year-olds, although consequences lagged behind causes for both age groups. Children's understanding of causes increased from fall to spring for both 3- and 4-year-olds, but for consequences it increased only for 3-year-olds. Concerning the order of acquisition of the four abilities, the results indicated that recognition developed first, followed by labeling, then by causes, and finally by consequences. This linear trajectory was confirmed using both concurrent and longitudinal data.

Low-income preschoolers' emotional expressive and situational knowledge

The current study examined the development of low-income preschoolers understanding of basic emotions in terms of expressive and situational knowledge. Expressive knowledge is conceptualized as children's ability to recognize and label prototypical emotion expressions; situational knowledge is conceptualized as children's understanding of causes and consequences of emotions. Children's understanding of emotions is seen as a key component of their social competence as they seem to draw on this type of understanding in the course of social interactions (e.g., Denham, 1998; Denham, Blair, DeMulder, Levitas, Sawyer, Auerback-Major, & Queenan, 2003; Denham, Zoller, & Couchoud, 1994). Being able to recognize others' emotions, as well as the situational determinants and consequences related to these emotions, is an important source of information for children as they need to use this knowledge to anticipate their own and others' emotional reactions, to regulate their emotions, comfort others, and overall to make sense and negotiate their social environment. Researchers have been proposing that emotional and social competences are intertwined and they often highlight their interdependence. For example, Denham, Salisch, Olthof, Kochanoff, and Caverty (2002) argue that "the interpersonal function of emotion is central to its expression and experience, its very meaning... conversely, social interactions and relationships are guided, even defined, by emotional transactions" (p. 308).

Although emotional understanding seems to be a crucial component of social development, there seem to be very few studies directed toward understanding these abilities with low-income preschoolers, a population for which these skills may play a critical role. Children from low-income backgrounds are seen to be at high-risk for

aggressive and anti-social behaviors when compared to children from middle-class backgrounds (for an extensive review see Dodge, Coie, & Lynam, 2006). Garner (1994) states that chronic stress related to poverty seem to have deleterious impact on the emotional lives of parents and consequently that of their children. She further elaborates that because these parents have to deal with a host of financial concerns and other stressors, low-income parents demonstrate less responsiveness and nurturance to their children and to their needs, and they tend to rely more often on coercion and physical punishment to gain obedience from their children. Garner, Jones, and Miner (1994) have provided some evidence that this pattern of parenting behaviors, along with children's social cognitive skills, are related to low-income children's social competence, who show a great deal of behavioral problems (e.g., Garner, et al., 1994; Shields, Dickstein, Seifer, Giusti, Magee & Spritz, 2001; and for an extensive review see Dodge et al., 2006).

Despite the significance of emotional understanding for low-income children's social development, very few studies have examined low-income children's emotional understanding and its development. Rather the bulk of the research has been conducted with middle-class children. Because emotional development seems to be highly influenced by children's social interactions (e.g., Denham, 1998; Garner, Jones & Gady, 1997; Garner et al., 1994; and Smiley & Huttenlocher, 1989), and because patterns and styles of social interactions vary according to socioeconomic status (e.g., Heath, 1986; Lareau, 2002; Miller, 1994; Wiley, Rose, Burger, & Miller, 1998), it is important that we explore the development of low-income children's emotion understanding. The current study addressed this need by focusing solely on low-income children's emotional development. It attempted to capture the development of five basic emotions among low-

income 3- and 4-year-olds regarding their expressive and situational knowledge, and to look at this development both cross-sectionally and longitudinally. The specific hypotheses guiding the current study were derived from reviewing the research conducted mainly with middle-class children, which follows.

EMOTION UNDERSTANDING

As just mentioned, emotion understanding has been divided into two broad areas: (1) children's emotion expression knowledge, understood as their ability to recognize and label facial emotion expressions, and (2) children's situational emotion knowledge, understood as their ability to identify the situational determinants of basic emotions as well as the consequences related to them. Researchers agree that for individuals to act swiftly and competently in an emotion-inducing situation, they must be able to identify the emotion based on facial expressions, to associate this expression correctly with the situational determinants and consequents related to it, and to anticipate an emotion based on these situational determinants and consequents (Denham, 1998).

Emotion Expression Knowledge

Children's emotion expression knowledge has been assessed in two ways: (1) First, children's ability to recognize different emotion expressions, and (2) children's ability to correctly label the specific emotion expressions. The majority of the studies have tested middle-class samples, and very few have examined low-income children's knowledge of emotion expressions. This research has shown that middle-class preschoolers are quite apt at recognizing and labeling emotion expressions independent of the way emotion cues have been presented to them; that is, whether through schematic drawings, movies, photographs, or verbal expressions.

Recognition of Emotion Expressions in Middle-Class Children

Overall, studies using middle-class samples have found that by 5 years, children are able to recognize and label 4 basic emotion expressions: happy, sad, angry, and scared. To test children's recognition of emotions, children were first presented with a number of photographs or drawings depicting the face of an adult or child expressing the basic emotions. They were then asked to either point to a specific expression or to match the test stimulus to a similar one. A host of studies have shown that 2-year-olds were able to correctly (over 50% of children) recognize happy expressions, 3-year-olds sad expressions, and 4-year-olds angry and scared expressions (Denham, 1986; Smith & Walden, 1998; Stifter & Fox, 1987; Walden & Field, 1982; for a review see Gross & Balif, 1989). Michaelson and Lewis (1985) have also included a few other emotions (e.g., surprise, disgust) that seem to be correctly identified only after 5 years of age.

Labeling of Emotion Expressions in Middle-Class Children

Regarding middle-class children's ability to correctly label basic emotion expressions, research reveals a pattern consistent with that of recognition abilities. To test this ability, children were commonly first shown a photograph or a schematic drawing of the emotion expression and then asked to label the emotion depicted. As found for recognition, the ability to label is easiest for happy expression, followed by sad, followed by angry and scared, with no specific order between these last two emotions (Denham, 1986; Michaelson & Lewis, 1985; Smith & Walden, 1998; Stifter & Fox, 1987; Walden & Field, 1982; for a review see Gross & Balif, 1989).

While the sequence is the same, research has also indicated that children's ability to label emotions lags behind their ability to recognize these same emotions. Michaelson

and Lewis (1985), as well as Denham (1986), found that overall children's ability to recognize a basic emotion was superior to their ability to label these emotions, and this was especially true for the younger children. Specifically, Michaelson and Lewis found that children's ability to recognize emotion expressions establishes itself around 3 to 4 years of age; and children's ability to label emotion expressions establishes itself about 1 year later, between the ages of 4 to 5 years.

Recognition and Labeling of Emotion Expressions of Low-Income Children

There are only three studies that have tested low-income children's recognition and labeling abilities (Garner et al., 1997; Garner et al., 1994; and Shield et al., 2001), but these present a limited picture. Each of these studies have combined recognition and labeling into one total emotion expression knowledge score, and two of them did not separate the scores across the various emotions tested. Only Garner's et al. study (1994) did that, but still did so in a limited way because they combined recognition and labeling scores. They tested 46 (25 boys and 21 girls) 4- and 5-year-olds on their abilities to recognize and label emotion expressions. They found that 4- and 5-year-olds best recognized and labeled happy, sad, and angry emotions, which in turn were more readily identified than scared,. However, we cannot compare the results of this study to those obtained by middle-class children because the recognition and labeling scores were combined. Although Garner et al. did not find significant differences in children's understanding of happy, sad, and angry, an intriguing picture emerges when looking at their table of means. While the order of acquisition of emotion expression for middle-class children has been that of happy, followed by sad, angry, and scared, the results by Garner and colleagues indicate that for low-income children this pattern may go from

happy, followed by angry, sad, and scared. Thus, although Denham et al. (2002) have proposed that children's emotion expression knowledge is the same for low-income and middle-class children, Garner and colleagues results seem to suggest a slightly different order of acquisition.

Situational Emotion Knowledge

Research demonstrating that children have an understanding of situations related to specific emotions has developed along two main lines. One focuses on children's ability to match an emotion to experimenter-provided situations (what we refer as recognition of emotion eliciting situations), and the other focuses on children's ability to understand and conceptualize the situational determinants (causes) related to a specific emotion and their consequences.

Recognition of Emotion Eliciting Situations

This refers to children's ability to identify, among different types of basic emotions (happy, sad, angry, or scared), which one "matches" the presented eliciting situation. In these tasks, the experimenter narrates emotion-eliciting vignettes to children about familiar situations and children are asked to indicate which emotion corresponds to the eliciting situation. Researchers have first varied the "props" used to introduce the eliciting situation: either by telling a story through a sequence of drawings or a single drawing, or by telling a story using puppets. Children are then asked to either point to a picture, or to a schematic felt drawing, or to use a verbal emotion label. Similar to the research conducted on children's ability to recognize and label emotion expressions, the majority of these studies have also focused on middle-class samples and very few studies have focused on low-income children. In this section, we first review the research

conducted with middle-class children, and then review the few studies conducted with low-income samples.

Research with *middle-class children* has found that the ability to recognize emotion eliciting situations varies according to the specific emotions as well as the age of the children tested. Specifically, researchers have found that by 5 years of age, children recognize prototypical emotion eliciting situations for all 4 basic emotions: happy, sad, angry, and scared. However, it is difficult to state a developmental progression since the results have not been clear cut.

Michaelson and Lewis (1985) found a developmental progression in 2- to 5-year-olds' ability to identify specific emotions. In this study, children were told a vignette, accompanied by a drawing, and they were asked to indicate which emotion expression matched the vignette. Michaelson and Lewis found that happy situations were easiest to identify and earliest understood, with 70% of the 2-year-olds identifying the happy situations correctly; sad seemed to be the next emotion with over 60% of the 3-year-olds, and over 90% of 5-year-olds; angry and scared were last, and only 5-year-olds recognized the emotion eliciting situation with scores that reached just above chance.

Using a slightly older population (kindergarten to 4th grade) and pictures with just implicit action and no story accompaniment, Brody and Harrison (1987) confirmed the general pattern found by Michaelson and Lewis. They also found that children's ability to identify happy and sad situations emerged earlier than angry and scared situations, and overall, older children matched emotion eliciting situations more readily than younger ones. They also found that happy and sad situations were recognized more readily by kindergarteners than were all other emotions (warmth, surprise, relief, hope, scared,

embarrassment, guilt, jealousy, anger and disgust). In addition, they noted that scared was one of the situations that children had the greatest difficulty with, never reaching above chance levels even for 4th graders.

In contrast, Denham and Couchoud (1991) found no age differences in 2- to 4-year-olds' ability to recognize emotion eliciting situations. However, instead of using drawings, as the previous studies have done, they used puppets to enact eight vignettes, accompanied by vocal and visual affective cues, emitted by the puppet/experimenter. These were common familiar vignettes so that the puppets could be imagined to feel the same way as most people. Children were asked to find the correct facial expression (depicted on felt) for the emotion being elicited and to place it on the puppet that had no facial expression. Denham and Couchoud found that 2-year-olds were just as apt at identifying emotion eliciting situations as 4-year-olds were. Still, happy expressions were more readily identified than negative expressions (sad, angry, and fear together), but happy and sad were marginally different from each other.

Taking these three studies together, it appears that when using a more difficult task (Michaelson & Lewis, 1985 and Brody & Harrison, 1987), in which the emotion-eliciting situation is either told or implied through pictures, a developmental progression in children's understanding of emotions emerges. More specifically, when using a more difficult task that requires the child to think solely of the situation, with no additional verbal or vocal cues, younger children have a more difficult time matching the eliciting situation with the emotion expression or label, in comparison to older children. However, when using a task that is greatly simplified (Denham & Couchoud, 1991), where the eliciting situation is told to the child through puppets, accompanied by puppet body

language as well as vocal and facial cues (such as emotion expressions) of the experimenter, 2-, 3- and 4-year-olds seem to be at the same level of emotion understanding, in terms of recognition of emotion eliciting situations.

Regarding *low-income children's* comprehension of emotion eliciting situations, only three studies have used tasks measuring this component of emotion understanding. However, two of the three studies have used this task only as a way to obtain an overall score of children's emotional understanding, and only one study (Garner et al., 1994) has explored differences across emotions. Garner et al. (1994) tested 46 (25 boys and 21 girls) 4- and 5-year-olds' ability to recognize emotion eliciting situations. Although they collapsed across age, their results presented a similar pattern to that of middle-class samples. They found that children were most knowledgeable about happy, sad, and angry emotion eliciting situations ($M = 2.19$, $M = 1.91$, and $M = 2.00$, respectively), with all of these emotions being more readily identified than scared ($M = 1.49$). Although the differences between happy, sad, and angry were not significantly different, looking at the means raises a question whether the order of emergence of these emotions is in fact the same as the order of emergence for middle-class children. Namely it appears that, while low-income children may identify happy situations more readily than all others as do middle-class children, angry may be the emotion that follows for low-income children as opposed to sad, which is the one following for middle-class children. This is a suggestive possibility; and given the different social experiences of low-income children, it may well be that the developmental progression of low-income children's situational emotion knowledge may be slightly different than that of middle-class children. However, more research is needed to explore this intriguing possibility.

Understanding of Causes and Consequences of Emotions

While the line of research just reviewed has contributed to our understanding of children's ability to identify basic emotions that match prototypical eliciting situations, it unfortunately does not tell us enough about children's *own* conceptualizations of emotions. This is accomplished more fully by the second line of research that taps children's ability to identify and conceptualize situational determinants (causes) related to a specific emotion as well as their consequents. In this line of research, the experimenter shows children a photograph or a picture depicting a basic emotional expression, names the emotion depicted, and asks them (a) for causes, "*What makes [self or others] feel [emotions]?*" or (b) for consequents "*What do you do when you feel [emotion] ?*" Researchers have varied the props by using either drawings of facial emotion expressions or emotion labels, both together, or narrations of emotionally charged vignettes.

Several studies have explored children's conceptualizations of causes and consequences of emotions. All these studies have focused on middle-class samples and no study has explored low-income children's conceptualizations. The following section reviews these studies in order to indicate the age at which children are able to provide causes and consequences of emotions, in addition to whether and how children's conceptualizations may differ.

Children's Conceptualizations of Causes of Emotions

In an attempt to test whether children differentiated between emotions in terms of their causes, Russell (1990) asked 4- to 5-year-olds (65 boys and 55 girls) to provide causes for happy, sad, angry, scared, and surprise. The experimenter explained to the children that they were going to make up a story together; then started to tell a story, and

then asked the children to complete it. Specifically, the experimenter said: “*One day Jennifer was feeling very very [emotion]. She was feeling so [emotion] that everyone could tell she was [emotion]. Her mom could tell, her father could tell, and all her friends could tell she was feeling very [emotion].*” The experimenter would then ask: “*Why do you think Jennifer was feeling this way?*” The following emotion to be tested was introduced by saying: “*On the next day, Jennifer was feeling...*” Children were asked to provide causes for all 5 emotions, but were randomly assigned to three conditions that varied the level of presentation for each emotion: using just a face, a label, or both.

Children’s responses were coded as appropriate or inappropriate causes for each emotion as judged by a subjective method (using complete agreement from two independent coders with no pre-established coding scheme) as well as an objective method (the probability of a judge guessing the emotion to which the child had responded). Both methods yielded similar results in that most 4- and 5-year-olds were able to specify appropriate causes for basic emotions (as captured by both the subjective and objective methods), with the exception of excitement and surprise which yielded a lower number of appropriate responses. Russell also found that 5-year-olds were better than 4-year-olds at providing causes, indicating that the ability to provide appropriate causes per emotion increased with age. Furthermore, he found that preschoolers’ knowledge of emotion causes was evoked no differently when a picture or label was provided, but was best when both were used together. Although this study provides evidence that children are able to differentiate emotions in terms of causes, it does not provide us with sufficient concrete information in how children are conceptualizing the different emotions. By asking coders to judge responses as appropriate or inappropriate

without stating explicitly what appropriate responses entail, it does not help us to understand how children are conceptualizing each emotion tested.

Denham and Zoller (1991) further addressed the issue of children's conceptualization of emotion causes. They tested 47 (23 boys and 24 girls) 4-year-olds who were shown a puppet expressing a specific emotion (happy, sad, angry, or scared) and were asked to indicate what makes the puppet feel that emotion. Children's appropriate responses were coded as either nonsocial (material goods, environmental events, foods or animals), social (physical, verbal, nonverbal interactions), or fantasy. They found that children did not provide random responses for causes of emotions; rather, children assigned different and specific causes to different emotions, indicating that children differentiate emotions in terms of being caused by social, non-social, or fantasy situations. In fact, while 70% of causes for happy were nonsocial, 70% for sad and 90% for angry were social, and 45% of causes for scared were fantasy-based. However, these categories are rather broad and do not fully allow us to tap further variability that may exist in children's conceptualizations of emotions.

Fabes and colleagues (Fabes, Eisenberg, McCormick, & Wilson, 1988; and Fabes, Eisenberg, Nyman, & Micalieau, 1991) further addressed the issue of children's conceptualizations of emotions by providing subcategories to the broader "social" category proposed by Denham and Zoller (1991). Through two studies, they examined whether and how children were able to provide causes for naturally occurring emotions in other children. In both studies, Fabes and colleagues observed 3- to 5-year-old children in their preschool playground. After one child spontaneously displayed an emotion, the experimenter interviewed another child standing nearby by asking them to label the

emotion observed (Fabes et al., 1991) and to provide the cause or an explanation for that emotion (Fabes et al., 1988, 1991). Children's causal responses were coded in terms superordinate and subordinate categories. The superordinate categories were social (situations involving person-person interactions) or non-social (situations in which no other persons except the emitter are involved). The superordinate social category was further subdivided into several subordinate categories: physical (e.g., hitting), verbal (e.g., name calling), nonverbal (e.g., ignoring), control (e.g., teacher making child put toys away), and material interactions (e.g., giving something to someone).

The results from the first study (Fabes et al., 1988) indicated that overall children's emotions (happy, sad, angry, scared and distress) were primarily categorized as social. However, when comparing the different categories per emotion, their results corroborated those found by Denham and Zoller (1991) in that happy and sad were categorized as social while angry, scared and distressed were categorized as nonsocial. Concerning the subcategories, they found that distress was associated with the physical subcategory, whereas happy was more associated with the verbal and nonverbal categories. Control and material categories, overall, were more associated with sad and angry than with happy or distress.

To further explore these results, in a second study, Fabes and colleagues (1991) coded children's responses not only in terms of the categories just reviewed (superordinate and subordinate), but also in terms of external or internal explanations. They were interested to find out whether children's explanations of others' emotions were understood as an internal desire or need that was either attended to or frustrated, or whether children's explanations were related to causes that were external to the child

such as eating an ice cream or getting a present. The results replicated their initial findings that the specific emotions fell again under the same superordinate and subordinate categories, but it also indicated that children were more likely to refer to others' negative emotions as caused by internal explanations than for others' positive emotions (happy).

While the two studies by Fabes and colleagues help us understand how children further conceptualize causal antecedents of basic emotions, these studies fall short in several ways. First, they are limited to the types of emotions naturally occurring in a playground setting, which more frequently center on sad and angry emotions, while happy but especially scared and surprised are far less common. Second, while these researchers were able to differentiate the social category further, they were not able to further differentiate the nonsocial category. For example, while it may be the case that happy is mostly associated with nonsocial situations, what types of situations are these? Are children associating happy mainly with getting presents, or doing special activities, or going to special places, or with displays of affection? And are these responses equally represented? Without attempting to subdivide further these general categories, one cannot fully understand children's conceptualizations for each of these emotions. The third limitation stems from the fact that Fabes and colleagues were not able to integrate the social vs. nonsocial differentiation with the internal vs. external one introduced in the second study. Finally, this research does not allow us to fully examine children's developmental trajectories regarding their conceptualization of emotions; instead, it allows us to indicate that children differentiate across various emotions and seem to do so as early as 4 years of age.

Only Strayer (1986) has addressed the issue of development of children's understanding of causes through a study conducted with older children. A total of 44 children (22 boys and 22 girls) divided in two age groups (preschoolers and 2nd graders) along with 40 adults were tested. Children were interviewed about what would make [self, same-sex other, opposite-sex other and adult] feel [happy, sad, angry, scared, or surprised]. Instead of just categorizing causes as social or nonsocial she further subdivided these categories into more specific instances: material goods, fantasy, interpersonal themes, environmental events, achievement themes, and added two more categories, food and animals, based on children's responses. Strayer's results confirm that 5-year-olds can differentiate across five basic emotions in terms of their causes. She found that interpersonal themes were mainly used to explain anger and sadness; material goods and events for surprise and happiness; and fantasy and environmental events for scared. She also found that older children (2nd graders) used more interpersonal and achievement themes as explanations for emotions than did the younger children (5-year-olds).

In sum, although these five studies provide evidence that children are differentiating across different basic emotions, more work needs to be done to capture more fully the types of conceptualizations children have regarding specific emotions. For example, showing that sad and angry are caused by interpersonal themes does not allow us to understand whether and how children exactly differentiate these emotions and what is unique about children's conceptualization of sad versus angry. It seems that in order to capture children's conceptualizations of specific emotions, we may need to look at each

emotion separately. We also need to look at the conceptions and variations specific emotions reflect and to avoid clustering them together from the very beginning.

Children's Conceptualizations of Consequences of Emotions

Concerning children's conceptualizations of consequences, very few studies have explored this aspect of children's situational knowledge. In a pioneering study, Russell (1990) explored children's ability to express consequences associated with basic emotions, and did this by providing children with a basic storyline, as we saw earlier (see p. 11 for procedure). Instead of looking only at consequences, Russell was also interested in comparing children's overall ability to express causes and consequences of emotions. The 120 4- and 5-year-olds tested were randomly assigned to the cause or consequence condition. For differentiating appropriate from inappropriate responses, he used the exact same methods he used of causes: namely, children's responses were coded as appropriate or inappropriate as judged by using both a subjective method (using high agreement from two independent coders with no pre-established coding scheme) and an objective method (the probability of a judge guessing the emotion to which the child had responded). He found that children as young as 4 years of age were able to differentiate among the consequences of basic emotions. In other words, children provided different responses for consequences of happy, sad, angry, and scared.

Concerning differences between children's understanding of causes and consequences of emotions, he found that children also differentiated causes from consequences. Specifically, 5-year-olds gave more correct responses for causes and fewer appropriate responses for consequences; this difference was not found with 4-year-olds, indicating that 4-year-olds' knowledge of causes and consequences did not differ. Five-

year-olds were also overall better at providing appropriate responses for causes and consequences than younger children. He also found that the biggest discrepancies between causes and consequences were for surprise and scared, with causes being easier than consequences. These results indicate that children are able to differentiate causes from consequences, and they are able to do so as early as 4 years of age. Children also seem to be able to differentiate among the consequences for basic emotions, although they seem to find it more difficult than differentiating among causes for these same emotions. However, the way the data were coded does not allow us to capture children's specific conceptualizations of consequences per emotion.

Stein and Trabasso (1989) also looked at children's conceptualizations of consequences by examining how conceptualization of goals plays a role in children's conceptualizations of emotions. Specifically, they were interested in testing whether children understood emotions in terms of goal attainment or goal failure. Four to 5-year-olds were given a story about themselves in which the first part of each episode introduced success or failure in attaining a goal, and in the second part the protagonist either succeeded in attaining the goal or failed to maintain the same goal. Children were asked about what they would potentially do, if they were put in such situation and they experienced such emotion (thus asking for consequences for happy, sad, and angry). Children's responses were coded into 7 categories: (1) goal achievement or enhancement of existing goals; (2) gratitude toward another for helping to achieve the goal; (3) reinstatement of a denied or lost goal; (4) substitution of another goal or activity; (5) giving up a lost or denied goal; (6) seeking revenge on the agent who caused goal failure; and (7) expressing emotion or focusing on feeling generated by success or failure. Results

indicated clear differences in consequences as a function of successful versus failed outcomes. The desire to maintain or enjoy a goal followed success, and the desire to reinstate, substitute, or forfeit the goal was the prototypical response for failure. For specific emotions, happy was more associated with goal enhancement, sad with goal reinstatement and substitution, and angry with goal reinstatement, substitution, and revenge. Thus, this study provides evidence that children, as young as 4 years of age, are able to differentiate emotions that fit more abstract causal situations. Although this study provides another way of looking at children's conceptualizations of consequences, because all situations provided to the children were goal-oriented, it is unclear whether these patterns would hold if children were provided with situations that are not so clearly goal-oriented.

The final study about consequences was provided by Denham (1997) who was interested in looking at children's ability to provide consequences for emotions in a family context. She asked children to enact dollhouse family vignettes depicting consequences of their own expressed emotions (happy, sad, angry, and scared). Children were given a vignette about a familiar emotion eliciting situation and they were asked to finish acting out the story using the doll. Specifically, children were asked to enact what the parents would do, if they had seen the child express a specific emotion in a specific context. A total of 77 (39 boys and 38 girls) 4- to 5-year-olds were tested. Children's responses were coded using parental reactions to children's emotions: that is, comfort, directive/discipline, discussion of emotion eliciting events and feelings, pragmatic actions (dealing directly with the emotion eliciting situation), matching emotion, and irrelevant answers. Overall, Denham found that 4- and 5-year-olds attributed plausible, nonrandom

parental reactions to their own (child's) emotions. Children understood happy consequences as associated with parents demonstrating the same emotion as the child; sad with directive/discipline and pragmatic actions; angry with directive discipline; and afraid with pragmatic action. She argued that these results indicate that 4- and 5-year-olds have a fairly solid conception of how adults behave after experiencing a specific emotion arousal, and of the specific reactions that caregivers have to children's emotions. Thus, children as young as 4 years are beginning to understand the consequences of emotions, even if the consequential reactions are coming from parents.

In sum, these studies indicate that children are beginning to differentiate consequences for basic emotions. However, depending on the context provided to children, slightly different ways of conceptualizing consequences emerge that cannot be fully compared to each other. It may be that the contexts provided to the children may somewhat curtail or direct children's responses. For this reason, we were interested in providing children with no much contextual support so that we could gather children's conceptualizations for both causes and consequences in a less restricted format.

General Summary

This review indicates that research on children's emotion expression knowledge has found that children as young as 3 to 4 years of age can recognize basic emotion expressions (happy, sad, angry, and scared) well above chance. It has also found that by 4 to 5 years of age, children can correctly label basic emotion expressions. Given this time lag, researchers have also argued that children are first able to recognize before they can label emotion expressions. Concerning the order of emergence of these emotions, researchers have found that children first understand happy and sad, then angry, scared,

and finally surprise. This order has been found while examining children's emotion expression knowledge as well as children's ability to recognize emotion eliciting situations. With respect to children's situational emotion knowledge, due to the diversity of research methodology and coding schemes used, very few overarching conclusions can be reached. Overall, researchers have found that by 4 years of age children can differentiate between basic emotions in terms of causes as well as consequences, and that by this age children are already conceptualizing emotions differently. Further, these studies indicate that when some context is provided for children, they are able to provide good responses for the questions being asked. They have also implied that children's understanding of causes of emotions precedes their understanding of consequences. Concerning the development of children's situational emotion knowledge, studies using recognition of emotion eliciting situations have found that there is an order present in how children understand the causes of emotions: namely, children first understand happy situations, followed by sad, angry, and scared. For consequences, no studies have been conducted; but since this order has been consistently found for expressive knowledge as well as part of situational knowledge, one can assume that the same order may hold.

As this review has also made clear, previous studies in the field of emotional development have primarily focused on middle-class children and have overall assumed that the patterns seen with middle-class children should be similar to low-income samples (Denham et al., 2002; and Garner et al., 1994). However, given the paucity of research with low-income children, whether their emotional development follows that of middle-class children still remains an open question. It is this question that the current study attempted to address.

THE CURRENT STUDY

The purpose of this study was to examine the development of low-income children's emotional knowledge by looking at four different emotion understanding abilities (recognition, labeling, causes, and consequences) and how these abilities relate to each other, while exploring children's knowledge of five basic emotions (happy, sad, angry, scared and surprise).

Although researchers make general claims about children's emotion understanding and its development, diverse samples have not been sufficiently included to fully justify such general claims. Miller, Cho, and Bracey (2005) state that "we researchers are caught in a dominant discourse – all but invisible at times – that implicitly privileges middle-class ways." They further argue that social class is one of the great open secrets in the United States; it is everywhere and yet it is hidden, slippery and elusive (p. 3). In a recent review, Denham et al. (2002) acknowledged the scarcity of research on low-income children's emotion understanding and stated that in the future researchers need to examine emotional development with this population.

It is important then to focus on low-income children's emotion understanding. However, the question arises whether we expect to find similar or different patterns between low-income and middle-class children. On the one hand, researchers have assumed that low-income children's emotional knowledge should follow similar patterns to those of middle-class children. Specifically, they propose that children's understanding of specific emotions develops in the same order and presuppose that children understand emotion eliciting situations in similar ways (Denham, 2002; and Garner et al., 1994). On the other hand, researchers have shown that emotional understanding is closely tied to

social interactions (e.g., Denham, 1998; Garner et al. 1997, 1994; and Smiley & Huttenlocher, 1989). Furthermore, given that different socialization practices are beginning to be documented across middle- and low-income families, one may well expect different developmental trajectories of the emotional understanding for these two groups.

For example, researchers have uncovered that styles of social interactions of middle-class children are different from those of low-income children. For example, Garner et al. (1994) states that chronic stress related to poverty has harmful impact on the emotional lives of parents and consequently on the lives of children. They also propose that because low-income parents deal with a great deal of financial concerns and other stressful situations, these parents tend to demonstrate less responsiveness and nurturance to their children and also tend to rely more often on coercion and physical punishment to gain compliance from them. While middle-class parents also deal with stressful situations, the frequency and the intensity by which these affect their lives and the lives of children seem to be much less so.

In addition, research comparing the socialization practices of middle-class and low-income parents has found that overall middle-class parents participate in children's lives differently than do low-income parents. For example, Lareau (2002) found that middle-class children are socialized through the strong mediation of adults who organize children's time, activities, and goals, while low-income children are socialized with much less participation from adults in their activities. In an earlier pioneering study, Heath (1986) also found a similar pattern with respect to parental participation in children's overall education and development. While middle-class parents engaged children as

young as 6 months in book reading and storytelling practices through books and conversations about day to day events, low-income parents rarely engaged in either book reading practices or other frequent conversational practices with their children. Instead, these children were left to figure out the world mainly on their own or through the company of siblings and peers. Further, Miller (1994) as well as Wiley et al. (1998) found that, with respect to children's participation in day to day conversations with parents, middle-class children's narrative autonomy was fostered that was seen as a natural gift from the parent to the child; thus, the child had the right to participate and tell stories. In contrast, low-income children were socialized to see narrative autonomy as a right to be earned; that is, to have their own views and to be able to express them, was not a natural right guaranteed to all but something to be earned and defended (Wiley et al., 1998). In addition, Miller (1994) found that, while middle-class children are taught how to deal with disagreements and threats through conversation and discussion, low-income children are taught to stand up for their rights in the face of threats and affronts through parental teasing and play fighting. Due to all these differences in socialization practices just reviewed across middle-class and low-income children, we expected that low-income children's emotional development may also follow different trajectories than those of middle-class children.

To investigate low-income children's emotional understanding, five research goals emerged as central to the current study. The first goal was to examine low-income children's expressive knowledge, through their ability to recognize and label emotion expressions. Our aim was to examine how well children know specific emotion expressions and to understand which ones they know better than others. We expected that

there would be some differences between what emotions middle-class and low-income children know. Specifically, based on the work of Garner and colleagues (1994), we expected that low-income children would know happy and angry better than sad, scared, and surprise. This is different from the order of middle-class children's expressive knowledge, which indicates that they know happy and sad better and earlier than angry, scared, and surprise (Denham, 1986; Michaelson & Lewis, 1985; Smith & Walden, 1998; Stifter & Fox, 1987; Walden & Field; 1982; for a review see Gross & Balif, 1989). In addition, we also expected a time lag in low-income children's knowledge of emotion expressions in comparison to that of middle-class children because children's emotional development seems to be fostered by frequent and didactic parental conversations, a practice that, as we just saw, is not so common for low-income families.

The second goal was to examine children's situational emotion knowledge through their ability to provide causes and consequences for emotions. No study has addressed these issues with low-income children. Further, even with middle-class children, although there are studies that have addressed children's knowledge of causes separately from that of consequences, no study has attempted to look at them together. Concerning our specific predictions, although studies exploring children's understanding of causes and consequences of emotions have not focused on the developmental trajectories of these abilities, studies focusing on children's recognition of emotion eliciting situations have found that children first understand happy situations, followed by sad, angry, and scared (Michaelson and Lewis, 1985 and Brody and Harrison, 1989). However, in a study conducted with low-income children, Garner et al. (1994) has found results that point to a different pattern. They have found that low-income children first

understand happy, followed by angry, sad, and scared. We expected that low-income children's knowledge of causes and consequences of emotions would follow the same order indicated by Garner and colleagues. Concerning the age at which children would achieve an established knowledge of causes and consequences, we expected a time lag in comparison to middle-class children. While researchers have found that children as young as 4 years of age have an established knowledge of happy, sad, and angry, we expected that low-income children would have at least one year lag in comparison to middle-class children.

To address this second goal fully, our third goal was to develop a coding scheme that can capture how preschool children conceptualize and differentiate between emotions in terms of causes as well as consequences. While previous studies have provided evidence that children are able to differentiate across basic emotions, more work needs to be done to capture more fully the types of conceptualizations children have regarding specific emotions. In addition, to be able to capture the developmental trajectories of these abilities, a more detailed coding scheme needs to be developed that attends to differences in children's conceptualizations and to the types of mistakes children make as they are attempting to reach more established conceptualizations.

The fourth goal was to examine the developmental trajectories of preschoolers' emotional abilities (recognition, labeling, causes and consequences) for five basic emotions. Specifically, we were interested in looking at differences between 3- and 4-year-olds as well as examine the developmental trajectories for each age group over time (from fall to spring). Research on children's emotional development has mostly focused on cross-sectional studies; very few studies have looked at the development of children's

emotional understanding longitudinally. To address these questions, we tested 3- and 4-year-olds twice over the course of the school year, with approximately 7 to 8 months between each testing session. At the very least, this allowed us to expand our age groups and include 3-, 4- and 5-year-olds.

Finally, our fifth goal was to examine the order of acquisition of the four different emotion understanding abilities tested: that is, recognition, labeling, causes and consequences. Denham (1998), and Michaelson and Lewis (1985) have proposed that children's ability to recognize emotion expressions precedes their ability to label these same expressions. Denham (1998) has also proposed that children's knowledge of emotion expressions precedes their situational knowledge. Russell (1990) has also suggested that children's understanding of causes precedes their understanding of consequences. While these predictions seem sound, only the relationship between recognition and labeling has been examined directly and has received some support. But no study has examined the order of acquisition of causes and consequences as well as the order of acquisition of all four abilities together.

To test this hypothesis, we proposed two competing models. The first was a linear model, in which children's ability to recognize emotions would be followed by their ability to label emotion expressions, followed by their understanding of causes, and finally by their understanding of consequences (see Figure 1). The second model is a non-linear model, in which children's ability to recognize emotion expressions would be followed by their ability to label emotion expressions, and this would lead to children's understanding of causes and consequences simultaneously (see Figure 2). Based on both

support and conjunctures from previous research, we expected that the linear model would fit the data better than the non-linear model.

METHOD

Participants

A total of 130 children were tested, 50 3-year-olds (25 boys and 25 girls; $M=41.4$ months, $SD=3.9$) and 80 4-year olds (37 boys and 43 girls; $M=53.22$ months, $SD=3.5$). All the children in this study came from low-income families. Of the sample, 62% lived in households that met the federal poverty guidelines as evidenced by their Head Start eligibility. The other 38% of the sample were from working-class families (for complete demographics, see Table 1). The majority of our sample came from single homes as 73% of the children lived with a single parent ($N=95$). The sample was diverse with 53% Caucasian ($N=69$), 21% Hispanic ($N=28$), 21% African American ($N=28$), and 4% were of mixed race ($N=5$). However, 94% of the children tested spoke only English, and only 6% were bilingual.

Procedure

The data for this study were drawn from a larger project examining the effect of a Storytelling and Story-Acting activity in promoting various cognitive, language and social abilities for preschool children. The participating preschool classrooms were from a county-wide day care program serving low-income communities in a middle-size town in the northeastern U.S. Children were presented with a battery of language and emergent literacy tasks (narrative comprehension and production, expressive and receptive vocabulary, phonemic, rhyming, and print and word awareness) as well as social understanding tasks (emotion understanding and a social problem solving task). These

tasks were presented in a random order to the children. Only children's emotion understanding task is discussed here.

Children were tested individually in a quiet room adjacent to their classroom by a trained experimenter. Children's responses to the emotion understanding task were written down in the testing protocol but were also audio-recorded for accuracy. Children were tested twice on the same task, once toward the beginning (October/November) and once toward the end of the school year (May).

Emotion understanding task. This task was adapted from Denham (1998) and Denham and Zoller (1991) and it measured children's emotion expression and situational knowledge. Instead of using adult photographs, as most studies have done, we used a set of pictures depicting children around 7 to 10 years of age and of various ethnic backgrounds with an almost equal number of boys and girls (2 boys and 3 girls). These pictures were drawn from an art training book depicting emotion expressions (Faigin, 1990). We were interested in looking at children's understanding of 5 basic emotions: happy, sad, angry, scared, and surprise. The pictures were selected to depict the most prototypical facial expressions for basic emotions corresponding to Eckman and Friesen's research (1978), while making sure that we were using a racially diverse group of children.

In the first section of the task, children were asked to recognize and label a specific emotion expression among a set of 5 different expressions: happy, sad, angry, scared, and surprise. To test children's ability to *recognize* emotions, the five photographs were laid out in front of the participants in a specific order - mad/angry, sad, happy, surprised and scared. This order was chosen to maximize contrasts between

similar emotion expressions. Children were then asked to point to the photograph that matched the emotion label provided by the experimenter. The order in which the experimenter asked for the emotion expression labels was different from the order of display. (See Appendix A for the exact testing protocol).

To test children's ability to *label* emotions, the set of photographs were collected by the interviewer and were presented one by one to the child. This section of the task was intermixed with the test of children's ability to provide causes and consequences. Children were presented with one photograph at a time and they were asked how the child depicted in the photograph felt. If the label provided was correct, the experimenter went on with the rest of the task. However, if the label was incorrect, the experimenter corrected the child before moving on. The experimenter then asked children to provide first the causes and then the consequences for that emotion. This method was followed because Russell (1990) has found that children do better at naming the causes and consequences of emotions when they are provided with both a verbal and visual cue.

Specifically, once the label of the emotion was provided, the experimenter asked the child for the *cause* of that emotion. Children were asked to pretend that the depicted child is them, *Let's pretend it's you*, and were then asked, "*What makes you feel this way?*" If children were able to provide a cause easily enough, they were probed to provide another one. After providing causes for the emotion, participants were immediately asked for *consequences* related to that emotion. Children were asked: "*When you feel [emotion] what do you do?*" Again, if children were able to provide an answer easily enough, they were probed for one more consequence. In this second portion of the task, the order in which the emotions were presented to the children was set. Children

were first asked about sad, then happy, then scared, then angry and finally surprise. This order was chosen to maximize children's responses by making them comfortable by first asking them about the easier emotions before moving on to the harder ones.

Coding

Emotion Expression Knowledge

Participants' correct responses for recognition or labeling received 2 points per emotion, and a total of 10 points per ability (5 emotions for recognition and labeling, separately). Acceptable expressive synonyms for labeling were mad for angry and fearful, frightened or afraid for scared. Children received 1 point when responses were partially correct (wrong emotion but correct valence). Acceptable responses for labeling were behavioral descriptions (e.g., the happy face was laughing) or identifying the appropriate valence of the emotion (e.g., sad for scared – *monsters make me sad*). Inappropriate or incorrect responses received 0 points. The entire dataset for both recognition and labeling was independently coded by two coders (the author and a trained undergraduate research assistant). Interrater agreement was 100% for recognition and 99% for labeling. The disagreement in labeling was due to oversight by one of the coders.

Situational Emotion Knowledge

The purpose of this coding scheme was to capture how children conceptualize these five emotions in terms of causes and consequences. The categories for this coding were broadly based on the work of Fabes et al. (1988) and Strayer (1986) as well as on two coders' readings of children's actual responses. (Details about the generation of the coding scheme are provided at the end of this section).

Causes of emotions. Overall, children's appropriate responses for causes were given 2 points, partially appropriate or ambiguous responses 1 point, and inappropriate or incorrect responses 0 points (see Table 2 for a more detailed coding scheme for appropriate causes).

For *happy*, appropriate responses included: *getting something special* (e.g., getting toys from the toy store; when Santa gives me a present); *doing a special activity* (e.g., when mommy says we are going to see Spiderman; when my mommy reads me a book); *going/being somewhere special* (e.g., going to Dorney Park; when my mommy takes me to Chucky-Cheese); *being with someone special* (e.g., when my mommy stays home with me; going to Grammy's house); and *displays of affection* (e.g., when someone is my friend; when people are nice to me). For *sad*, appropriate responses included: *physical and/or psychological punishment/harm* (e.g., when mommy spansks me; when mommy yells at me); *loosing something valuable (person, object or activity)* (e.g., when someone takes my toys; when my puppy dies); and *person, object or activity that the child wants, but cannot have* (e.g., when mommy doesn't let me get something; when mommy and daddy don't let you go to work with them).

For *angry*, appropriate responses included: *physical and/or psychological punishment/harm* (e.g., when my brother comes and beats me up; when my sister says bad stuff to me); *person, object or activity that is being taken away* (e.g., when one of my cousins took my scooter away from me; when mommy takes my toys away); and *person, object or activity that the child wants, but cannot have* (e.g., when mommy won't let me feed my cat; when mommy won't take me to Dunkin' Donuts).

For *scared*, appropriate responses included: *encountering scary entities* (e.g., I'm scared of real monsters, wolves and bears; when a Ghost goes under my bed); *being in the dark, being alone and nighttime related themes* (e.g., when the lights are turned off and I'm scared of the dark; when everyone leaves); *potentially harmful situations or scary activities* (e.g., when my brother crosses the street; when I watch a scary movie) and *potentially harmful environmental events* (e.g., I'm scared of lightning and thunder).

Finally, for *surprise* appropriate responses included: *special occasions* (e.g., when I have a birthday party and I don't know and they give me a big surprise.); *getting presents* (e.g., when Santa gives you a present and you open it and it's a rocket ship), and *general reference to unexpected things* (e.g. when I saw a monster; we close our eyes and open them and they say surprise).

Children's responses were considered partially appropriate or ambiguous when they provided incomplete responses, responses that confused causes of emotions of the same valence (e.g., scared cause for sad), or responses that confused causes with consequences. Children's responses were considered inappropriate when they provided responses that were unrelated to the questions being asked, responses that were a repetition of the emotion label, or responses for an emotion that is of the opposite valence.

For the generation of this coding scheme, the author and her advisor read one fourth of children's responses and, independently, created a list of appropriate, partially appropriate, and inappropriate responses. Then they come together to discuss their coding schemes, and when they had developed a preliminary coding scheme that they both agreed on, they tested its validity with a group of graduate and undergraduate students, so

that finally, through a number of iterative going over the data and categories, we developed a scheme that both of us and the group agreed upon. After we devised the final coding scheme, both the author and her advisor coded 50% of the data and established 100% agreement. Then the author and a third coder (a new undergraduate, whom we trained) coded the rest of the data. Exact interrater agreement between these last two coders was of 94% for happy, 97% for sad, 95% for angry, 96% for scared, and 94% for surprise.

(*Note:* Harter and Whitesell [1989] have developed a coding scheme for children's conceptualizations of causes that is rather similar to ours. We became aware of this coding scheme after we had developed our own and have coded the data. Overall, our categories overlap to a large degree with those introduced by Harter and Whitesell, which gives us confidence as to the validity of the categories arrived in our coding scheme. Still, our coding scheme includes more categories and one more emotion, surprise, than theirs.)

Consequences of emotions

Overall, children's appropriate responses for consequences were given 2 points, partially appropriate or ambiguous responses 1 point, and inappropriate or incorrect responses 0 points (see Table 3 for a more detailed coding scheme of appropriate consequences).

For *happy*, appropriate responses included: *spontaneous reactions for happy or behaviors related to feeling that emotion* (e.g., smile; jump up and down); *telling/sharing with someone what they are feeling and/or what caused the emotion* (e.g., I just tell my mommy I'm happy now; tell my mommy I'm so happy); *a plausible positive behavior*

that the child may engage in while feeling the emotion (e.g., you play; you play with your friends); and *behaviors that make others happy, while also making the child happy* (e.g., I love my daddy; I give my mommy a hug).

For *sad*, appropriate responses included: *spontaneous reactions for feeling sad or behaviors related to feeling that emotion* (e.g., I cry; tears come out of my eyes); *other-regulation for disappointment* (e.g., tell your mom; when you're at school you tell your teacher); and *self-regulation disappointment* (e.g., I ask them for my toys back; not play puzzles or games with them)

For *angry*, appropriate responses included: *spontaneous reactions for feeling angry or behaviors related to feeling that emotion* (e.g., I yell at someone; I turn the videotape off and throw it at her); *other regulation for angry* (e.g., I tell my daddy and it won't hurt my feeling any more; I tell my mom that I'm mad and people – mommy- talks to me); and *self-regulation for angry* (e.g., tell mom and dad that I want my toys back; I say, mommy why did you do that to me?).

For *scared*, appropriate responses included: *spontaneous reactions for feeling scared or behaviors related to feeling that emotion* (e.g., I run away; I scream); *other regulation for scared* (e.g., I tell mommy that there's something scary in my room; I hug my mom and tell her I'm scared); and *self-regulation for scared* (e.g., I tie a rope to my window and slide down it and run to my parents; call the cops).

Finally, for *surprise*, appropriate responses included: *spontaneous reactions for surprise or behaviors related to feeling that emotion* (e.g., I say yay; I jump in the air); and *telling/sharing with someone what they are feeling and/or what caused the emotion* (e.g., I tell my mommy I'm surprised).

Children's responses were considered partially appropriate or ambiguous when they provided incomplete responses, responses that confused consequences of emotions with the same valence (scared consequences for sad), responses that confused consequences with causes, or when the child provided responses that were an action sequence directly associated to the cause they had stated for that specific emotion (Cause: I feel happy when I get a new toy – Consequence: I play with my toy). Children's responses were considered inappropriate when they provided responses that were unrelated to the questions being asked, responses that were a direct repetition of an emotion label, or a response for an emotion that was of the opposite valence.

For the generation of this coding scheme, the exact same procedure was followed as explained previously for causes. After the final coding scheme was devised, both the author and her advisor coded 50% of the data and established 100% agreement. Then the author and a third coder (a new undergraduate, whom we trained) coded the rest of the data. Exact interrater agreement between these last two coders was of 93% for happy, 95% for sad, 96% for angry, 96% for scared, and 93% for surprise.

RESULTS

This study addressed four main hypotheses. Overall, we expected that irrespective of the emotion understanding ability tested - whether that of recognition, labeling, causes, or consequences – we would find that: (1) children's knowledge would vary by the five emotions tested; (2) 4-year-olds' knowledge would be better than that of 3-year-olds; and (3) children's understanding of emotions would increase from fall to spring. The fourth hypothesis addressed a model of emotional development that posits a linear sequential relation of the four emotion understanding abilities tested so that children's ability to

recognize emotion expressions would develop first, followed by their ability to label emotion expressions, followed by their ability to provide appropriate causes for emotions, and finally followed by their ability to provide appropriate consequences for emotions.

Children's responses for each of these four abilities over five emotions were analyzed in two ways: (1) through the percentage of children who gave fully appropriate responses (2 points); and (2) through analyses of the means averaging over incorrect/inappropriate, partially correct/appropriate and fully correct/appropriate responses. Concerning the percentage of correct responses, we were interested in examining how children's understanding of these emotions progressed and established themselves. Therefore, when interpreting these percentages, we adopted the following criteria: emotions were *weakly established* if only 50% to 65% of the children were able to provide correct/appropriate responses; emotions were *somewhat established* if 65% to 80% of the children were able to provide correct/appropriate responses; and finally emotions were *well or strongly established* if over 80% of the children were able to provide correct/appropriate response (for these results, see Tables 4 and 7).

To test our first three hypotheses, we conducted mixed ANOVAs on the means with 2 between (Age: 3- and 4-year-olds and Gender: Males and Females) and 2 within (Semester: Fall and Spring and Emotion: Happy, Surprise, Sad, Angry and Scared) factors. Preliminary analyses indicated that gender was not significant whether as a main effect or interaction so this factor was dropped from all subsequent analyses. When follow-up tests of simple effects were conducted, Bonferroni adjustments were implemented to maintain a family-wise error rate of .05. The descriptive statistics for these analyses are found in Tables 5, 6, 8, and 9.

Finally, to test the fourth hypothesis, we conducted a structural equation analysis testing the order of acquisition of these four emotion understanding abilities. Details of the exact models tested are presented when the analyses are introduced.

I. Preschoolers Emotion Expression Knowledge

Recognition of Emotion Expressions

For children's recognition of emotion expressions, children's scores per emotion ranged from 0 for incorrect responses to 2 for correct responses. Table 4 shows the percent of children who were able to correctly recognize the emotion (received 2 points).

In the fall, 3-year-olds ability to correctly recognize emotions was somewhat weak. Happy was the only emotion that was somewhat established, with 74% of the children recognizing this emotion, followed by sad which was just beginning to become established with 52% , followed by angry, scared, and surprise none of which reached above chance scores (with 38%, 28%, and 28%, respectively). By the spring 3-year-olds were better able to recognize emotion expressions. Similar to the patterns demonstrated in the fall, happy was the only strongly established emotion, with 92% of the children recognizing this emotion, followed by sad, angry ,and scared, all of which were weakly established with 52%, 56% and 54% of the children recognizing these emotions, respectively. Surprise was the last emotion children were able to recognize, and did not reach above chance scores, with only 38% of the children recognizing this emotion.

For the 4-year-olds, their fall scores followed the scores and patterns of the 3-year-olds' spring scores, when most 3-year-olds turned four. In the fall, 4-year-olds had a well established knowledge forf happy, with 93% of the children recognizing this emotion, followed by a weakly established knowledge for sad, angry, scared, and surprise

with 60%, 58%, 54% and 53% of the children recognizing these emotions, respectively. In the spring, 4-year-olds became more knowledgeable about emotions, but a different pattern emerged. While happy was still the only well established emotion, with 95% of the children recognizing it, children now demonstrated a somewhat established knowledge of angry as opposed to sad, with 70% of the children being able to recognize this emotion. Sad, surprise, and scared were still weakly established with only 61%, 61%, and 56% of the children recognizing these emotions, respectively.

These results were further confirmed by the ANOVA on the means. As expected, the analysis for children's ability to recognize emotion expressions yielded a main effect of emotion type, $F(4, 512) = 46.93, p < .001$, indicating that children's ability to recognize emotions varied according to the emotion expressed (see Table 5). Simple effects revealed that children were able to recognize happy ($M = 1.79$) better than any other emotion, $p < .001$, followed by sad ($M = 1.14$), angry ($M = 1.11$) and scared ($M = .96$) (which were not significantly different from each other), followed by surprise, ($M = .90$) (not significantly different from scared, but marginally different from sad and angry, $p = .055$ and $p = .077$, respectively). In addition, consistent with our hypotheses, there was a main effect of age, $F(1, 128) = 14.56, p < .001$, indicating that 4-year-olds recognized emotion expressions better ($M = 1.32$) than 3-year-olds ($M = 1.03$); and a main effect of semester, $F(1, 128) = 9.40, p < .01$, indicating that children's ability to recognize emotions increased from fall ($M = 1.07$) to spring ($M = 1.28$).

Labeling of Emotion Expressions

For children's labeling of emotion expressions, children's scores per emotion ranged from 0 for incorrect responses to 2 for correct responses. Table 4 shows the percent of children who were able to correctly label the emotion (received 2 points).

In the fall, 3-year-olds ability to correctly label emotions was fairly weak. At this point children's knowledge for happy and sad was weakly established with only 52% and 50% of the children, respectively, being able to label these emotion expressions correctly. Angry, scared, and surprise, however, never reached above chance scores with only 34%, 24%, and 10% of the children, respectively, correctly labeling these emotions. By the spring, 3-year-olds were better at labeling emotion expressions. Happy was the only well established emotion with 84% of the children being able to label the emotion; Sad and angry were the emotions that followed, both just starting to become established, with 64% and 54% of the children, respectively. Finally, scared and surprise were the last emotions children were able to label, never reaching above chance scores, with only 42% and 22% of the children, respectively, correctly labeling this emotion expression.

For the 4-year-olds, their fall scores followed the scores and patterns of the 3-year-olds' spring scores, when most of these children turned 4. In the fall, 4-year-olds had a well established knowledge of happy, with 91% of children correctly labeling the emotion, followed by a somewhat established knowledge of sad, with 78% of the children, and a weakly established knowledge of angry and scared, with 56% and 50% of the children, respectively. Surprise was the last emotion to be correctly labeled with scores never reaching above chance (34%). In the spring, the patterns were somewhat different than those found in the fall. Four-year-olds had a well established knowledge of happy

and sad with 97% and 85% of the children, respectively, being able to label these emotions correctly. Angry and surprise, as opposed to scared, were the emotions that followed, and were somewhat established with 70% of the children being able to label both emotions correctly. Finally, scared was the last emotion to be correctly labeled, with just over half of the children being able to label the emotion correctly (53%).

These results were further confirmed by the ANOVA on the means. As expected, the analysis for children's ability to label emotion expressions yielded a main effect of emotion type, $F(4, 512) = 54.85, p < .001$, indicating that children's ability to label emotion expressions varied according to the emotion being expressed (see Table 6). Simple effects revealed that children were better at labeling happy ($M = 1.62$) than any other emotion, $p < .001$, followed by sad ($M = 1.52$) and angry ($M = 1.35$) (not significantly different from each other) followed by scared ($M = 1.01$) (which was, in turn, significantly lower than angry, $p < .001$), followed by surprise ($M = .73$), (which was significantly lower than scared, $p < .05$). In addition, consistent with our hypothesis, there was a main effect of age, $F(1, 128) = 43.57, p < .001$, indicating that 4-year-olds labeled emotion expressions better ($M = 1.47$) than 3-year-olds ($M = 1.02$); and a main effect of semester, $F(1, 128) = 55.48, p < .001$, indicating that children's ability to label emotion expressions increased from fall ($M = 1.08$) to spring ($M = 1.41$).

There was an Emotion X Age interaction, $F(4, 512) = 2.72, p < .05$, indicating that children's ability to label emotions varied by age and by the emotion being expressed. Follow-up tests indicated that 4-year-olds were significantly better at labeling happy, $p < .001$, sad, $p < .001$, angry, $p < .001$ and surprise, $p < .001$, than 3-year-olds. However, this was not true for scared, in which 3- and 4-year-olds ability to label this expression did not

significantly differ from each other (see Figure 3). There was also a Semester X Age interaction, $F(1,128)=5.36, p<.05$, indicating that the rate of increase from fall to spring in children's ability to label emotion expressions was higher for the 3-year-olds ($M=.81$ to $M=1.23$) than for the 4-year-olds ($M=1.36$ to $M=1.58$) (see Figure 4). There was a marginally significant Semester X Emotion interaction, $F(4, 512)=2.10, p=.08$, indicating that children's ability to label specific emotions in the fall was different from their ability to label the same emotions in the spring. Specifically, follow up tests revealed that while in the fall, surprise ($M=.48$) seemed to be the emotion that children have the most difficult time labeling in comparison to every other emotion (happy, $M=1.44$, sad, $M=1.40$, angry, $M=1.20$ and scared, $M=.91, p<.01$), in the spring, children's ability to label surprise increased ($M=.98$). In fact, in the spring, although the difference between surprise, happy ($M=1.80$), sad ($M=1.66$), and angry ($M=1.51$) were statistically significant, $p<.001$, the difference between surprise and scared ($M=.98$) was not statistically significant (see Figure 5). Finally, there was also a Semester X Emotion X Age interaction, $F(4, 512)=6.08, p<.001$, indicating that 4-year-olds' ability to label scared, from fall to spring ($M=1.16$ to $M=1.11$), did not increase as much as 3-year-olds' ability to label this same emotion from fall to spring ($M=.66$ to $M=1.10$).

II. Situation Based Knowledge

Causes of Emotions

Children's scores for emotion causes ranged from 0 for inappropriate responses to 2 for appropriate responses; however, because children were given two opportunities to provide causes, the total possible score per emotion was 4 points. Table 7 shows the

percent of children who were able to provide at least one appropriate response for each emotion (i.e., received at least 2 points).

Similar to children's expressive knowledge, in the fall, 3-year-olds' knowledge of causes was not well established. However, differently from the persistent order found in children's expression knowledge in which happy is the emotion children are most knowledgeable about, followed by sad, angry, scared, and surprise, for children's understanding of causes scared seems to be the emotion children are most knowledgeable about. In the fall, 3-year-olds had a weakly established knowledge of scared, with 56% of the children being able to provide appropriate causes. Sad, happy, angry, and surprise, never reached scores above chance, with only 38%, 36%, 22%, and 14% of the children, respectively, being able to provide appropriate causes. In the spring, 3-year-olds were more knowledgeable about emotion causes; however their overall knowledge was still weak. Scared was the only somewhat established emotion with 78% of the children being able to provide appropriate causes, followed by sad and happy, which were weakly established, 58% for both emotions. Angry and surprise, were the last two emotions, never reaching above chance scores, 46% and 42%, respectively.

For the 4-year-olds, their fall scores followed the spring scores of the 3-year-olds, when most of these children turned 4. In the fall, children had a somewhat established knowledge of scared, with 74% of the children being able to provide appropriate causes for that emotion. Happy, angry, and sad were the emotions that followed, with 68%, 66% and, 63% of the children, respectively, being able to provide appropriate causes for these emotions. Finally, surprise was the last emotion, with scores below chance (31%). In the spring, scared was still the only well established emotion with 84% of children being able

to provide appropriate causes, followed by happy, sad and angry, which were somewhat established, with 79%, 72%, and 72%, respectively for each emotion, followed by surprise, which never reached above chance level (49%).

These results were generally confirmed by the ANOVA on the means. As expected, the analysis for children's overall ability to provide appropriate causes yielded a main effect of emotion type, $F(4, 512)= 41.48, p<.001$, indicating that children's ability to provide appropriate causes for emotions varied according to the emotion addressed (see Table 8). Simple effects revealed that children were better at providing appropriate causes for scared ($M=2.22$) and happy ($M=1.99$) (which were not significantly different from each other), followed by sad ($M=1.82$) (which was not significantly different from happy), followed by their angry ($M=1.35$) (which was significantly lower than sad, $p<.001$), followed by surprise ($M=1.05$) (which was significantly lower than angry, $p<.05$). In addition, consistent with our hypothesis, there was a main effect of age, $F(1, 128)= 43.57, p<.001$, indicating that 4-year-olds were better at providing appropriate causes for emotion ($M=2.02$) than 3-year-olds ($M= 1.36$); and a main effect of semester, $F(1,128)=32.14, p<.001$, indicating that children's ability to provide appropriate causes for emotions increased from fall ($M=1.45$) to spring ($M=1.93$).

Further, the analysis revealed an Emotion X Age interaction, $F(4,512)=3.03, p<.05$ (see Figure 6), indicating that children's ability to provide causes varied according to children's age and emotion addressed. Follow up tests revealed that the difference between the age groups consisted of children's ability to provide causes for angry and surprise. While 3-year-olds ability to provide causes for angry ($M=.93$) and surprise ($M=.98$) did not significantly differ from each other, 4-year-olds' ability to provide

causes for angry ($M=1.77$) was significantly better than their ability to provide causes for surprise ($M=1.21$), $p<.001$.

Consequences of Emotions

Children's scores for emotion consequences ranged from 0 for inappropriate responses to 2 for appropriate responses; however, similar to the score for causes, because children were given two opportunities to provide consequences, the total possible score per emotion was 4 points. Table 7 shows the percent of children who were able to provide at least one appropriate response for each emotion (i.e., received at least 2 points).

Overall, we found that children's ability to provide emotion consequences was lower than their ability to provide emotion causes. However, even though their ability was lower, the order of children's understanding of emotions was consistent with the order found for causes, in which scared was the easiest emotion to provide consequences, followed by happy, sad, angry, and surprise. In the fall, 3-year-olds knowledge of consequences of emotions was far from established, with scores for each emotion not reaching above chance. Only 26% of the children were able to provide appropriate consequences for scared, 18% for happy and sad, 10% for angry, and only 2% for surprise. In the spring, even though children became more knowledgeable about consequences for each emotion, only scared was established at around chance level, with 50% of the children being able to provide appropriate consequences, followed by happy, sad, angry, and surprise, with scores that did not reach above chance, with 40%, 32%, 34%, and 6%, respectively.

For the 4-year-olds, in the fall, their scores somewhat followed the scores for the 3-year-olds in the spring in which scared and happy were the only weakly established emotions, with 59% and 51% of the children, respectively, being able to provide appropriate consequences. Sad, angry and surprise were the emotions that followed, with scores not reaching above chance, 49%, 34%, and 14%, respectively. In the spring, it appears that children's ability to provide emotion consequences did not increase that much. Scared, sad, and happy are still weakly established emotions, with 61%, 53%, and 50% of the children, respectively, being able to provide appropriate consequences, followed by angry and surprise, with below chance scores of 34% and 9%, respectively.

These results were further confirmed by the ANOVA on the means. As expected, the analysis for children's overall ability to provide appropriate consequences for emotions yielded a main effect of emotion type, $F(4, 512) = 32.33, p < .001$, indicating that children's ability to provide appropriate consequences for emotions varied according the emotion tested (see Table 9). Simple effects revealed that children were better at providing appropriate consequences for scared ($M=1.30$), happy ($M=1.18$), and sad ($M=1.13$) (which were not significantly different from each other) followed by angry ($M=.74$) (which was significantly lower than sad, $p < .001$), followed by surprise ($M=.43$) (which was significantly lower than angry, $p < .001$). In addition, consistent with our hypothesis, there was a main effect of age, $F(1, 128) = 19.86, p < .001$, indicating that 4-year-olds were better at providing consequences for emotions ($M=1.17$) than 3-year-olds ($M=.74$); and a main effect of semester, $F(1, 128) = 20.49, p < .001$, indicating that children's ability to provide consequences for emotions increased from fall ($M=.81$) to spring ($M=1.11$).

Further, there was a marginally significant Emotion X Age interaction (see Figure 7), $F(4,512)=2.18, p=.07$, indicating that children's ability to provide consequences for emotions varied according to children's age and emotion addressed. Follow-up tests revealed that, while 4-year-olds were better than 3-year-olds at providing consequences for happy, $F(1,128)=12.47, p<.01$, sad, $F(1, 128)= 10.49, p<.01$, angry, $F(1,128)=7.65, p<.05$ and scared, $F(1, 128)=9.18, p<.01$, their ability to provide consequences for surprise was not significantly different from 3-year-olds ability to provide consequences for this emotion. ($M=.37$ and $M=.48$, 3- and 4-year-olds, respectively). There was also a Semester X Age interaction (see Figure 8), $F(1, 128)= 13.91, p<.001$, which reflected a significant increase of 3-year-olds children's ability to provide consequences $F(1, 128)= 27.70, p<.001$, while 4-year-old children's ability to provide consequences did not increase.

III. The Relation of Expression and Situation Based Knowledge

This analysis looked at the relationship between the different emotion understanding abilities tested (recognition, labeling, understanding of causes and consequences), while taking specific emotions out of the equation. Children's score per ability ranged from 0-10 for recognition and labeling (2 points X 5 emotions), and from 0-20 for causes and consequences (4 points X 5 emotions). To test the order in which preschoolers' emotion understanding abilities developed two models were contrasted. The first was a linear model which proposes that children's ability to recognize emotion expressions develops first, followed by their ability to label emotion expressions, followed by their ability to provide appropriate causes, and finally followed by their ability to provide appropriate consequences (see Figure 1). The second model is a non-

linear one, which proposes that recognition of emotion expressions develops first followed by their ability to label emotions; however, different from the first model, causes and consequences of emotions are expected to develop concurrently (see Figure 2). Our hypothesis is that the linear model would fit the data best; however to test whether this is true, we contrasted it with the non-linear model just presented.

Both models were tested with concurrent data (fall) as well as longitudinal data (fall predicting spring). Because the ANOVAS revealed that there were significant age differences, both models were tested using two concurrent groups (3- and 4-year-olds separately). However, overall model fit was assessed with both groups combined. The specified models were tested with AMOS version 7.0 program using maximum likelihood estimation. Multiple indices of fit were examined, as recommended by Hu and Bentler (1999), such as chi-square, GFI, CFI, TLI, and RMSEA. And following the recommendations by Hu and Bentler (1999), good fit was determined by nonsignificant chi-squares and values greater than .95 for CFI, TLI and GFI as well as less than .05 for RMSEA.

Using Concurrent Data

To examine which model best fits the data, we compared chi-square and fit indices. Since these models were not nested, a chi-square difference test could not be conducted. As predicted, the results revealed that, when using concurrent data, the linear model fits the data better than the non-linear model (for descriptive statistics and correlation matrix, see Table 10). Specifically, the linear model presents a moderate fit, which is supported by $\chi^2(6, N=130)=12.88, p=.045, CFI=.94, TLI=.87, \text{ and } RMSEA=.09,$

in contrast to the nonlinear model's less than optimal fit, which is supported by $\chi^2(4, N=130)=48.85, p<.001, CFI=.59, TLI=.187, \text{ and } RMSEA=.235$.

Concerning specific relationships, for the linear model, all paths were significant for both 3- and 4-year-olds (see Figures 9 and 10). The analyses revealed that emotion recognition was in fact a significant predictor of emotion labeling ($\beta=.29, p<.05$ and $\beta=.50, p<.001$, 3- and 4-year-olds, respectively), which in turn was a significant predictor of the understanding of emotion causes ($\beta=.49, p<.001$ and $\beta=.41, p<.001$, 3- and 4-year-olds, respectively). The results also indicated that children's ability to understand causes is, in fact, a significant predictor of children's understanding of emotion consequences ($\beta=.60, p<.001$ and $\beta=.54, p<.001$, for 3- and 4-year olds, respectively).

The non-linear model, on the other hand, revealed that not all paths were significant (see Figures 11 and 12). Similar to the linear model, emotion recognition was in fact a significant predictor of labeling ($\beta=.29, p<.05$ and $\beta=.50, p<.001$, 3- and 4-year-olds, respectively), which in turn was a significant predictor of emotion causes ($\beta=.49, p<.001$ and $\beta=.41, p<.001$, 3- and 4-year-olds, respectively). However the path from emotion labeling to the understanding of emotion consequences, yielded different relationships depending on the age group tested. For 3-year-olds, a marginally significant relationship was found between the two emotion understanding abilities, ($\beta=.24, p=.78$), however, for 4-year-olds, this path was still found to be significant ($\beta=.37, p<.001$), indicating that for older children emotion labeling predicted understanding of emotion consequences.

Using Longitudinal Data

Our second set of analyses also had the purpose of testing which model best fits the data, the linear or nonlinear one. However, by using longitudinal data we were also interested in establishing the predictive power between the different emotion understanding abilities. Specifically, we were interested in verifying how much emotion expression knowledge (specifically, labeling) at one time point predicts children's understanding of situational knowledge at a later time point. To address these questions, this analysis used data from fall and spring. Emotion expression knowledge (recognition and labeling) was used from the fall, and situational emotion knowledge (causes and consequences of emotions), was used from the spring (see Table 11 descriptive statistics and correlation matrix).

To address which model best fits the data, we compared chi-square and fit indices. Since these models were not nested, a chi-square difference test could not be conducted. As predicted, the results from these analyses revealed that the linear model fits the data better than the non-linear model. More specifically, the linear model presents great fit, which is supported by $\chi^2(6, N=130)=2.67, p=.85, CFI=1.00, TLI=1.13,$ and $RMSEA=.00,$ in comparison to the non-linear model which presents a less than optimal fit, which is supported by $\chi^2(6, N=130)=57.16, p<.001, CFI=.33, TLI=.16,$ and $RMSEA=.26.$

Concerning specific relationships, for the linear model the significance of the paths varied according to the age group being examined. We found that emotion recognition was in fact a significant predictor of labeling, independently of the age group analyzed ($\beta=.29, p<.05$ and $\beta=.50, p<.001,$ 3- and 4-year-olds, respectively). However,

emotion labeling in the fall was a significant predictor of the understanding of emotion causes in the spring for the 3-year-olds ($\beta=.36, p<.01$), but not for the 4-year-olds ($\beta=.15, p=.18$). Further, the analysis indicated that children's ability to understand causes in the spring was, in fact, a significant predictor of children's understanding of consequences in the spring ($\beta=.65, p<.001$ and $\beta=.57, p<.001$, for 3- and 4-year olds, respectively), independently of age group analyzed (see Figures 13 and 14).

The non-linear model also yielded results that varied according to the age group being analyzed. Similar to the results from the linear model, this analysis revealed that emotion recognition was in fact a significant predictor of labeling ($\beta=.29, p<.05$ and $\beta=.50, p<.001$, 3- and 4-year-olds, respectively). However, emotion labeling in the fall was a significant predictor of the understanding of causes in the spring for the 3-year-olds ($\beta=.36, p<.01$), but not for the 4-year-olds ($\beta=.15, p=.18$). This analysis also indicated different patterns for 3- and 4-year-olds regarding the relationship between emotion labeling in the fall and consequences in the spring. We found that 3-year-olds' emotion labeling in the fall marginally predicted the understanding of consequences of emotions in the spring ($\beta=.26, p=.06$), but for 4-year-olds, this relationship was not significant ($\beta=.07, p>.05$) (see Figures 15 and 16).

DISCUSSION

The purpose of this study was to examine low-income children's understanding of emotions in terms of expressive and situational knowledge. Specifically, our aim was to study the developmental trajectories of children's emotion expression knowledge (recognition and labeling of emotions) as well as their situational emotion knowledge

(causes and consequences of emotions) as seen through 5 different emotions (happy, sad, angry, scared and surprise). While there is a large body of research examining middle-class children's developing understanding of emotions, very few studies have investigated this issue with low-income children. However, researchers have assumed that the patterns exhibited by low-income children's emotional development parallels those of middle-class samples (Denham et al., 2002 and Garner et al., 1994). While this may be true, some doubts arise when we consider that researchers have also found that children's emotional development is influenced by children's social interactions (e.g., Denham, 1998; Garner et al., 1997; Garner et al., 1994; and Smiley & Huttenlocher, 1989), which in turn, other researchers have shown to vary according to families' social economic status (Laureau, 2002; Miller, 1994; Wiley et al., 1998). This study aimed to address this question, while also examining the general trajectories of low-income children's emotional development in terms of expressive and situational knowledge as well as the relationship between them.

Low-Income Children's Emotion Expression Knowledge

When examining low-income children's emotion expression knowledge, we expected that, based on Garner et al's (1994) research, low-income children's development of expression knowledge would differ from that of middle-class children in terms of the acquisition order for specific emotions. Specifically, we expected that low-income children would first understand happy expressions, followed by angry, in turn followed by sad, scared, and surprise. This pattern contrasts with that found with middle-class children who understand happy expressions, followed by sad, followed by angry, scared, and surprise. Our findings did not confirm this hypothesis. We found that,

concerning children's emotion expression knowledge, there was little difference in terms of the order of acquisition between middle-class and low-income children. Specifically, for recognition we found that by 4 years of age, happy was the first emotion to become well established (with over 80% of the children being able to provide a correct response). Sad, angry, and scared were the next emotions, but none became well established, not even by the beginning of their fifth year (spring for 4-year-olds). Finally, surprise was the emotion that 3-year-olds had the most difficulty recognizing; however, for 4-year-olds their knowledge of this emotion reached above chance.

A similar pattern was found for children's ability to label emotion expressions. For low-income preschoolers, happy was the first emotion to become well established by the time most of these children turned 4 (with over 80% of the children being able to provide a correct response). Sad, angry and scared were the next emotions, with only sad becoming established by the beginning of their fifth year (the spring scores for 4-year-olds). Again, surprise was the emotion that 3- and 4-year-olds had the most difficulty. However by the time most of these children turned 5, this ability increased considerably (22% to 53%), but it did not become well established.

Concerning children's overall ability to recognize and label emotion expressions, we found that children's knowledge of emotion expressions increased from fall to spring, independently of the ability addressed (recognition or labeling), and the age group (3- or 4-year-olds) assessed. Also, we found that 4-year-olds were overall more knowledgeable about emotion expressions than 3-year-olds. In addition, when looking at both percentages and means, we found that children were more apt, especially 3-year-olds, at recognizing emotion expressions than they were at labeling these same expressions, a

hypothesis tested through the SEM model. The results also revealed an interesting pattern regarding the rate of change of these abilities. Specifically, we found that 3-year-olds' understanding of emotion expressions increased at a faster rate than did the 4-year-olds whose knowledge, in fact, remained mostly at the same level. However, it should be noted that 4-year-olds' knowledge leveled off without having reached ceiling. Finally, concerning the timing in which these abilities (recognition and labeling) become established, we found that while middle-class children appear to have an established knowledge of emotion expressions at around 3 to 4 years of age, in our study low-income children began to establish these abilities around 4 years. This implies that there is a one year lag across these groups.

Low-income Children's Situational Emotion Knowledge

Concerning low-income children's situational emotion knowledge, our aim was two-fold: (1) to understand when and how these specific emotions and abilities emerge and develop, and (2) to understand how preschoolers are conceptualizing these specific emotions in terms of causes and consequences. To be able to address both issues, we developed a coding scheme that attempted to capture the variability of children's conceptualizations of these emotions. While previous research has focused on children's understanding of causes and fewer on consequences, they have mainly focused on whether children are differentiating these emotions in terms of rather broad categories such as social vs. nonsocial, or internal vs. external (Denham, 1994; Fabes et al., 1988, 1991; and Strayer, 1986). While this research has been helpful in demonstrating that children are differentiating emotions from each other in broad terms, they have focused less in how children are conceptualizing specific emotions. In fact, this emphasis has not

allowed researchers to test the specific order of acquisition of emotions. By developing a coding scheme that attends to the specific conceptualizations, we were able to test both children's knowledge of the causes and consequences per emotion as well as their developmental progression.

In terms of conceptualizations of causes, our coding scheme revealed that overall children understand happy as being caused by getting a special object, doing a special activity, or being with a special person. Children were also able to conceptualize and differentiate between sad and angry. In fact, they understand sad as caused by punishment both physical or psychological harm (parents spanking the child or yelling at them) while they understand angry as frustration, such as having something taken away from them or not being able to do something they wish to do (friends that take their toys away or parents who do not allow them to do something they want to do). Causes associated with scared were mostly linked to encountering scary entities, such as monsters or ghosts, or potentially scary animals, such as dogs or bears. Finally, surprise seems to be mainly associated with birthday, such as surprise parties or getting presents.

For conceptualization of consequences, our coding scheme revealed that children appear to understand consequences in a number of ways. One way is in terms of spontaneous reactions that follow emotions: such as smiling for happy, crying for sad, hitting for angry, running away for scared, and jumping or yelling for surprise. Another set of responses mainly associated with negative emotions were strategies in dealing with the emotion either through the help of an adult (other-regulation) or on their own (self-regulation). Interestingly, some emotions were more prone to other-regulation strategies while others to self-regulation strategies. For example, sad and angry were emotions that

children attempted to self-regulate. They did so by telling an authority figure or the person who made them upset that they were sad or angry, or by distracting themselves in an attempt to feel better (find something else to do, play with another child, and so on). Scared was an emotion that children made more use of other-regulation strategy than self-regulation. For example, children looked to an adult or older sibling to deal with this emotion: that is, they yell for help, they tell the adult of what they are scared, or they find shelter in their parents' beds.

Regarding children's development of situational emotion knowledge, Michaelson and Lewis (1985) as well as Brody and Harrison (1989) found that for middle-class children happy was the first emotion to be understood in terms of situations, followed by sad, followed by angry, scared, and surprise. Based on the work of Garner et al. (1994), we expected that low-income children's development of situational knowledge would differ from those of middle-class children in terms of order of acquisition. Specifically, we expected that low-income children would first understand happy situations, followed by angry, followed by sad, scared and surprise.

Our findings partially confirmed our hypotheses. While we did not find the order of acquisition expected (happy, followed by angry, sad, scared and surprise), we did find consistent differences between middle-class and low-income children's situational knowledge. Specifically, we found that for low-income children's understanding of causes, scared was the emotion that children knew earliest and best. Children's knowledge of scared was closely followed by happy, which was followed by sad and angry. Finally, consistent with the patterns found for children's emotion expression knowledge, surprise was the emotion children had the most difficulty, never reaching

above chance levels. It is important to note though that out of the five emotions, scared came to be well established for the 4-year-olds, while all other emotions lagged a bit behind.

For consequences of emotions, we found that children's knowledge was weaker than that for causes, with no emotion becoming well established, not even by the beginning of children's fifth birthday. However, we did find that the order of acquisition for this ability was consistent with that found for causes. Specifically, scared was the emotion children knew earliest and best, followed by happy and sad. Angry and surprise were the emotions that children had the hardest time in providing consequences, and their knowledge never reached above chance. It is important to note that low-income children's difficulty in providing consequences for emotions is consistent with findings from middle-class samples. Russell (1990) found that children's ability to provide consequences of emotions lagged behind their ability to provide causes.

Overall, for low-income children's situational emotion knowledge, we found that children's knowledge increased from fall to spring independently of the ability addressed (causes or consequences). However, when looking at specific ages, we found that for consequences, while 3-year-olds' knowledge increased from fall to spring, 4-year-olds' knowledge did not. For causes, although both groups knowledge of situations increased, the rate of increase for the 3-year-olds was faster than the rate of increase of the 4-year-olds. We also found that 4-year-olds were overall more knowledgeable about emotional situations than 3-year-olds. In addition, concerning differences between the two abilities, we found that children were more apt at providing causes for emotions than they were at providing consequences, a hypothesis that was tested through the SEM models.

In reference to how the developmental timeline of low-income children's situational emotion knowledge compares to that of middle-class children (when the abilities emerge and become well established), unfortunately the findings cannot be compared due to variability in how these abilities were assessed as well as coded with middle-class children.

The Relation of Expression and Situation Based Knowledge

Concerning the relation across the four different emotion understanding abilities, our results indicated that children's understanding of emotion expressions precedes their understanding of the situational determinants of an emotion. Specifically, and confirming our hypothesis, our results indicated that children's emotional development starts from children's ability to recognize emotion expressions, followed by their ability to label them, followed by their ability to provide causes, and finally followed by their ability to provide consequences. This trajectory was confirmed using both concurrent data (fall only), as well as longitudinal data (fall predicting spring), with the fit of the model for longitudinal data being better than that for the concurrent data.

Further, we also looked at specific relationships between the different emotion understanding abilities for 3- and 4-year-olds separately. When looking at concurrent data, our results indicated that recognition was significantly related to labeling, which in turn was significantly related to children's ability to provide causes, which in turn was significantly related to children's ability to provide consequences, independently of age group tested. However, when looking at the longitudinal data, our results varied somewhat. We found that recognition in the fall was significantly related to labeling in the fall, which in turn was a significant predictor for children's ability to provide causes

of emotions in the spring but only for the 3 year-olds and not for the 4-year-olds. In addition, children's ability to provide causes in the spring was significantly related to their ability to provide consequences in the spring for both age groups. These findings from the longitudinal data may indicate that as children get older their situational knowledge is becoming less dependent on their expressive knowledge.

Conclusion and Implications

This study is a first step into examining low-income children's emotional development. Overall we found that low-income children's emotional development follows similar as well as different patterns in comparison to those of middle-class children. While we found similarities in terms of expressive knowledge, we also found differences in terms of situational knowledge. We speculate that differences due to socialization practices may play a larger role for situational knowledge than for expressive knowledge. It may well be that expressive knowledge is less dependent on social interactions and more on basic cognitive abilities. However, to test whether this is correct, it would be best to be able to compare our results against ones conducted with middle-class children using the same task and the same coding scheme.

Furthermore, this study indicated that low-income 4-year-olds were reaching a plateau in their understanding of emotions, especially with respect to understanding the antecedents and consequents of emotions, without having reached ceiling levels. While further confirmation of this result may be in order, this is an area where researchers and educators, may need to intervene, especially given the significant role that emotional understanding plays for the development of social competence. Overall, we believe the results of this study point to a need for more detailed research with low-income children's

emotional understanding, which is a group that should not be overlooked or taken for granted.

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Table 1. *Demographics and gender distribution of boys and girls per age group*

| | | N= 130 | |
|------------------|-------------|---------------|-------|
| | | Boys | Girls |
| Age | 3-year-olds | 25 | 25 |
| | 4-year-olds | 37 | 43 |
| | | # Of Children | % |
| HS Eligibility | Yes | 80 | 62 |
| | No | 50 | 38 |
| Family Structure | Single Mom | 94 | 73 |
| | | 31 | 23 |
| | Other | 5 | 4 |
| Race | White | 69 | 53 |
| | Black | 28 | 21 |
| | Hispanic | 28 | 21 |
| | Other | 5 | 4 |
| Language | English | 122 | 94 |
| | Bilingual | 8 | 6 |

- you tell the teacher

(3) Self- Regulation - *Behaviors that attempt to deal directly with the situation and emotion being elicited*

- Maybe you gotta make something happy, like build your toys like it was; I say: mommy, why did you do that to me?; Tell mom and dad that I want my toys back; Just tell them they made you angry

Scared

(1) *Spontaneous Reactions and Behaviors*

- Run away; Scream; Hit them

(2) Other- Regulation - *Telling/Sharing with someone what you're feeling or what caused the emotion in an attempt to regulate the emotion*

- Tell mom and dad there's something scary in my room; I go downstairs and I tell mom that's so dark in my room and there's a monster in my room; Hug my mommy and tell her I'm scared

(3) Self- Regulation - *Behaviors that attempt to deal directly with the situation and emotion being elicited*

- Sometimes I put myself in a hiding place so no monsters can get me; Beat the sharks with my bat; Tie a rope to my window and slide down it and run away to my parents; I go in my room and I lock the door; Call the cop

Table 3. Coding Scheme for Appropriate Emotion Consequences

| Types of Emotions | Examples |
|-------------------|---|
| Happy | <p>(1) <i>Spontaneous Reactions and Behaviors</i> - You smile; We laugh; I jump up and down</p> <p>(2) <i>Telling/Sharing with someone what you're feeling or what caused the emotion</i> - I just tell my mommy I'm happy now; Tell my mommy I'm so happy</p> <p>(3) <i>Plausible Behaviors that occur while feeling the emotion</i> - You play; I play outside with my friends; I play with them nice, I don't hit them; Watch TV and cartoons</p> <p>(4) <i>Behaviors that make others happy, while also making the child happy</i> - Give mommy and daddy a hug; Love my daddy</p> |
| Surprise | <p>(1) <i>Spontaneous Reactions and Behaviors</i> - I say YAY; I jump in the air; say mommy thank you and give her a hug</p> <p>(2) <i>Telling/Sharing with someone what you're feeling or what caused the emotion</i> - Tell your mommy you're surprised; Tell my mommy</p> |
| Sad | <p>(1) <i>Spontaneous Reactions and Behaviors</i> - Crying; Cry; Tears come out of our eyes; Go somewhere and cry</p> <p>(2) <i>Other Regulation - Telling/Sharing with someone what you're feeling or what caused the emotion in an attempt to regulate the emotion</i> - Go tell your mom and dad; When you're at school you should tell the teacher</p> <p>(3) <i>Self- Regulation - Behaviors that attempt to deal directly with the situation and emotion being elicited</i> - I ask them for my toys back; Use your words; Just tell them you didn't like it; Tell somebody to share; Play with someone else</p> |
| Angry | <p>(1) <i>Spontaneous Reactions and Behaviors</i> - Yell at people; Hit somebody; I turn the video tape off and I throw it at her; We throw ourselves on the floor again</p> <p>(2) <i>Other-Regulations- Telling/Sharing with someone what you're feeling or what caused the emotion in an attempt to regulate the emotion</i> - I tell my mom that I'm mad and people talk to me; Tell our daddy because it won't hurt our feeling any more</p> |

Angry

(1) *Harm (Physical or Psychological)*

- When my brother comes and beats me up; When my daddy spansks my hiney; When my sister says bad stuff to me - When somebody bees mean

(2) *Things the child wants but can't have (which would lead to frustration and anger)*

- When my brother doesn't listen; When mommy won't let me feed my cat; When mommy won't take me to Dunkin donuts; When bobby doesn't give my toys back

(3) *Withdrawal of something*

- Take things away and throw them in the garbage; When one of my cousins took the scooter from me; When mommy takes me toys away

Scared

(1) *Scary Entities (Imaginary and Fictional Characters, Big Animals and insects)*

- I'm scared of real monsters, wolves and bears; Vampires; When a ghost goes under my bed; If there was freddy kreuger; Spiders

(2) *Dark and Nighttime related themes*

- When the lights are turned off I'm scared of the dark; I get dreams and my dreams get scary; Nightmares; When everyone leaves; When I'm by my own

(3) *Potentially Harmful Situations and Scary Activities*

- When I watch a scary movie; Reading scary books

(4) *Environmental Events*

- Lightning; When it rains a lot and there's thunder

Table 2. *Coding Scheme for Appropriate Emotion Causes*

| Types of Emotions | Examples |
|-------------------|---|
| Happy | <p>(1) <i>Getting Special Things</i> - Getting toys from the toy store; When it's my birthday and I get something that I always wanted and I be so happy;</p> <p>(2) <i>Doing Special Activities</i> - That mommy said we are going to see Spiderman 3; Playing games and puzzles with my friends</p> <p>(3) <i>Going Special Places</i> - When I go to Dorney Park; When mommy takes me to Chucky-Cheese</p> <p>(4) <i>Being with Special People</i> - When mommy stays home; When I go to my grammy's house.</p> <p>(5) <i>Displays of Affection</i> - When someone is my friend; When people are nice to me</p> |
| Surprise | <p>(1) <i>Special Occasions</i> - When I have a birthday party and I don't know and they give me a big surprise ; When the Easter bunny comes and hides all the eggs</p> <p>(2) <i>Getting Presents</i> - when Santa gives you a present and you open it and it was a rocketship; When my daddy gives me presents for Valentine's day and a balloon comes in valentine's day</p> <p>(3) <i>General Reference to Unexpected things</i> - When I saw a monster; We close our eyes and open them, and they say surprise</p> |
| Sad | <p>(1) <i>Harm (Physical or Psychological)</i> - when mommy spans me; When my mommy yells at me ; When somebody be mean to me and they don't play with me</p> <p>(2) <i>Things the child wants but can't have (which would lead to disappointment)</i> - When mommy doesn't let me get something; I really like to sleep with mommy but she don't let me, that makes me feel sad; When mommy and daddy don't let you go to work with them</p> <p>(3) <i>Withdrawal of something</i> - Someone takes my toys; Someone take the puzzle; When my puppy dies; When my grandma dies; When people steal my toys</p> |

Table 4. *Frequency of Correct Responses for Recognition and Labeling of Emotions*

| | | Happy | Sad | Angry | Scared | Surprise | |
|---------------|-------------|--------|--------|--------|--------|----------|--------|
| 3's (N=50) | Recognition | Fall | 74% | 52% | 38% | 28% | 28% |
| | | | (N=37) | (N=26) | (N=19) | (N=14) | (N=14) |
| | Labeling | Spring | 92% | 54% | 56% | 54% | 38% |
| | | | (N=46) | (N=27) | (N=28) | (N=27) | (N=19) |
| | Labeling | Fall | 52% | 50% | 34% | 24% | 10% |
| | | | (N=26) | (N=25) | (N=17) | (N=12) | (N=5) |
| | Spring | 84% | 64% | 54% | 42% | 22% | |
| | | (N=42) | (N=32) | (N=27) | (N=21) | (N=11) | |
| 4's (N=80) | Recognition | Fall | 94% | 60% | 58% | 54% | 53% |
| | | | (N=75) | (N=48) | (N=46) | (N=43) | (N=42) |
| | Labeling | Spring | 98% | 61% | 70% | 56% | 61% |
| | | | (N=79) | (N=49) | (N=56) | (N=45) | (49%) |
| | Labeling | Fall | 91% | 78% | 56% | 50% | 34% |
| | | | (N=73) | (N=62) | (N=45) | (N=40) | (N=27) |
| | Spring | 97% | 85% | 70% | 70% | 53% | |
| | | (N=78) | (N=68) | (N=56) | (N=56) | (N=42) | |

Table 5. Means (and Standard Deviations) for Recognition of Emotions

| | | Happy | Sad | Angry | Scared | Surprise |
|---|--------|-------|--------|--------|--------|----------|
| | | (0-2) | (0-2) | (0-2) | (0-2) | (0-2) |
| | Fall | 1.48 | 1.04 | .76 | .56 | .56 |
| 3's | | (.87) | (1.00) | (.98) | (.91) | (.90) |
| (N=50) | Spring | 1.84 | 1.08 | 1.12 | .76 | 1.08 |
| | | (.55) | (1.00) | (1.00) | (.98) | (1.00) |
| | Fall | 1.88 | 1.20 | 1.15 | 1.05 | 1.08 |
| 4's | | (.49) | (.98) | (.99) | (1.00) | (1.00) |
| (N=80) | Spring | 1.95 | 1.23 | 1.40 | 1.23 | 1.13 |
| | | (.31) | (.98) | (.92) | (.98) | (.99) |
| Estimated Marginal Means (N=130) | TOTAL | 1.79 | 1.14 | 1.11 | .96 | .90 |

Table 6. Means (and Standard Deviations) for Labeling of Emotions

| | | Happy | Sad | Angry | Scared | Surprise |
|---|--------|--------|-------|-------|--------|----------|
| | | (0-2) | (0-2) | (0-2) | (0-2) | (0-2) |
| 3's (N=50) | Fall | 1.06 | 1.14 | .94 | .66 | .24 |
| | | (.99) | (.92) | (.87) | (.84) | (.62) |
| | Spring | 1.68 | 1.50 | 1.38 | 1.10 | .52 |
| | | (.74) | (.73) | (.75) | (.86) | (.84) |
| 4's (N=80) | Fall | 1.83 | 1.64 | 1.45 | 1.16 | .73 |
| | | (.569) | (.72) | (.69) | (.90) | (.94) |
| | Spring | 1.93 | 1.81 | 1.64 | 1.11 | 1.44 |
| | | (.382) | (.48) | (.60) | (.97) | (.88) |
| Estimated Marginal Means (N=130) | TOTAL | 1.62 | 1.52 | 1.35 | 1.01 | .73 |

Table 7. *Frequency of Correct Responses for Cause and Consequences of Emotions*

| | | Happy | Sad | Angry | Scared | Surprise | |
|---------------|--------------|--------|--------|--------|--------|----------|--------|
| 3's (N=50) | Causes | Fall | 36% | 38% | 22% | 56% | 14% |
| | | | (N=18) | (N=19) | (N=11) | (N=28) | (N=7) |
| | | Spring | 58% | 58% | 46% | 78% | 42% |
| | | | (N=28) | (N=28) | (N=23) | (N=39) | (N=21) |
| | Consequences | Fall | 18% | 18% | 10% | 26% | 2% |
| | | | (N=9) | (N=9) | (N=5) | (N=23) | (N=1) |
| | Spring | 40% | 32% | 24% | 50% | 6% | |
| | | (N=20) | (N=16) | (N=12) | (N=25) | (N=3) | |
| 4's (N=80) | Causes | Fall | 68% | 63% | 66% | 74% | 31% |
| | | | (N=54) | (N=50) | (N=53) | (N=59) | (N=25) |
| | | Spring | 79% | 72% | 66% | 84% | 49% |
| | | | (N=63) | (N=58) | (N=53) | (N=67) | (N=39) |
| | Consequences | Fall | 51% | 49% | 34% | 59% | 14% |
| | | | (N=41) | (N=39) | (N=27) | (N=47) | (N=11) |
| | Spring | 50% | 53% | 34% | 61% | 9% | |
| | | (N=40) | (N=42) | (N=27) | (N=49) | (N=7) | |

Table 8. Means (and Standard Deviations) for Causes of Emotions

| | | Happy | Sad | Angry | Scared | Surprise |
|---|--------|--------|--------|--------|--------|----------|
| | | (0-4) | (0-4) | (0-4) | (0-4) | (0-4) |
| 3's (N=50) | Fall | 1.16 | 1.20 | .58 | 1.84 | .60 |
| | | (1.36) | (1.38) | (.95) | (1.63) | (.95) |
| | Spring | 1.92 | 1.64 | 1.28 | 2.18 | 1.16 |
| | | (1.63) | (1.41) | (1.24) | (1.33) | (1.18) |
| 4's (N=80) | Fall | 2.18 | 1.96 | 1.71 | 2.25 | 1.00 |
| | | (1.42) | (1.45) | (1.50) | (1.44) | (1.09) |
| | Spring | 2.71 | 2.49 | 1.83 | 2.64 | 1.43 |
| | | (1.51) | (1.49) | (1.38) | (1.40) | (1.14) |
| Estimated Marginal Means (N=130) | TOTAL | 1.99 | 1.82 | 1.35 | 2.22 | 1.05 |

Table 9. Means (and Standard Deviations) for Consequences of Emotions

| | | Happy | Sad | Angry | Scared | Surprise |
|---|--------|--------|--------|--------|--------|----------|
| | | (0-4) | (0-4) | (0-4) | (0-4) | (0-4) |
| 3's (N=50) | Fall | .52 | .54 | .40 | .68 | .22 |
| | | (1.05) | (.93) | (.73) | (1.07) | (.50) |
| | Spring | 1.28 | 1.18 | .70 | 1.40 | .52 |
| | | (1.37) | (1.21) | (.93) | (1.37) | (.73) |
| 4's (N=80) | Fall | 1.49 | 1.34 | .94 | 1.45 | .50 |
| | | (1.20) | (1.16) | (1.07) | (1.20) | (.77) |
| | Spring | 1.45 | 1.45 | .94 | 1.68 | .46 |
| | | (1.11) | (1.25) | (1.06) | (1.25) | (.66) |
| Estimated Marginal Means (N=130) | TOTAL | 1.18 | 1.13 | .74 | 1.30 | .43 |

Table 10. *Correlation Matrix, Means, and Standard Deviations for Model with Concurrent Data*

| | Emotion Recognition | Emotion Labeling | Causes of Emotions | Consequences of Emotions |
|-----------------------------|------------------------|---------------------|-----------------------|-----------------------------|
| Emotion Recognition | 1 | | | |
| Emotion Labeling | .49** | 1 | | |
| Causes of Emotions | .43** | .53** | 1 | |
| Consequences of Emotions | .43** | .46** | .62** | 1 |
| N | 130 | 130 | 130 | 130 |
| Mean | 5.59 | 5.76 | 7.68 | 4.47 |
| S.D. | 3.02 | 2.81 | 5.16 | 3.48 |

** , $p < .01$

Table 11. *Correlation Matrix, Means, and Standard Deviations for Model with Longitudinal Data*

| | Emotion Recognition (Fall) | Emotion Labeling (Fall) | Causes of Emotions (Spring) | Consequences of Emotions (Spring) |
|---|----------------------------------|-------------------------------|-----------------------------------|---|
| Emotion Recognition (Fall) | 1 | | | |
| Emotion Labeling (Fall) | .49** | 1 | | |
| Causes of Emotions (Spring) | .19* | .34** | 1 | |
| Consequences of Emotions (Spring) | .14 | .20* | .60** | 1 |
| N | 130 | 130 | 130 | 130 |
| Mean | 5.59 | 5.76 | 9.97 | 5.58 |
| S.D. | 3.02 | 2.81 | 4.78 | 3.41 |

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

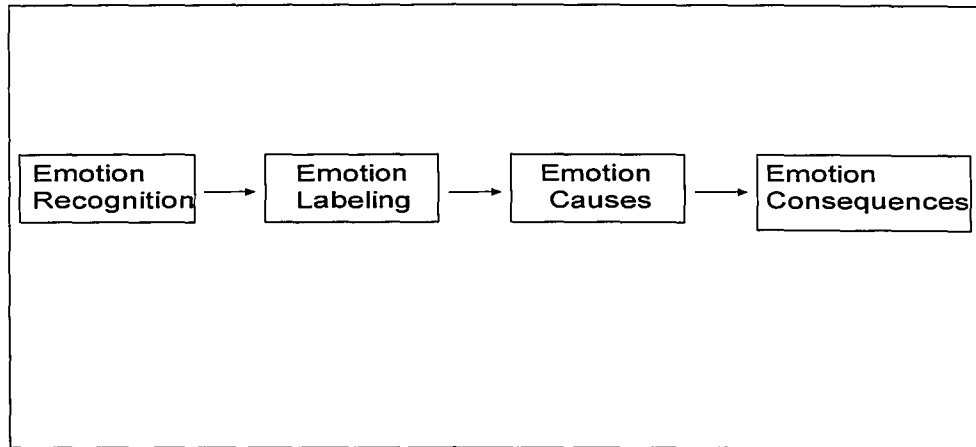


Figure 1. *Linear model of Preschoolers' Emotional Development*

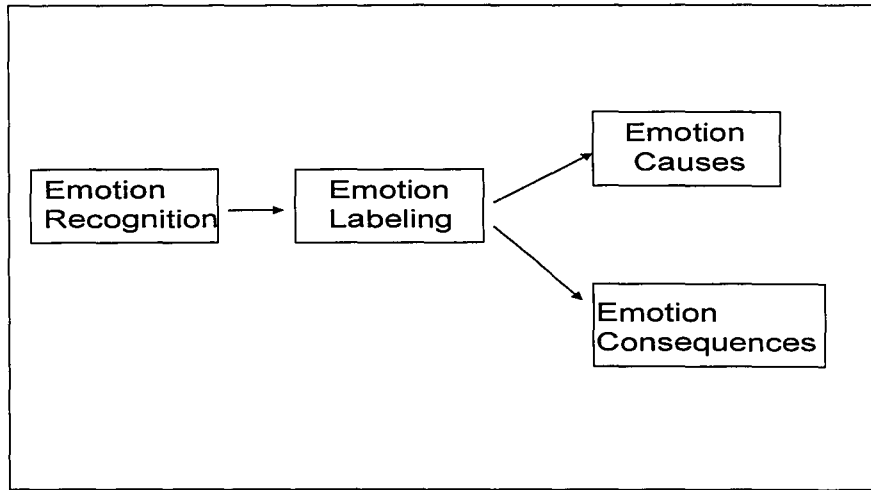


Figure 2. *Non-Linear model of Preschoolers' Emotional Development*

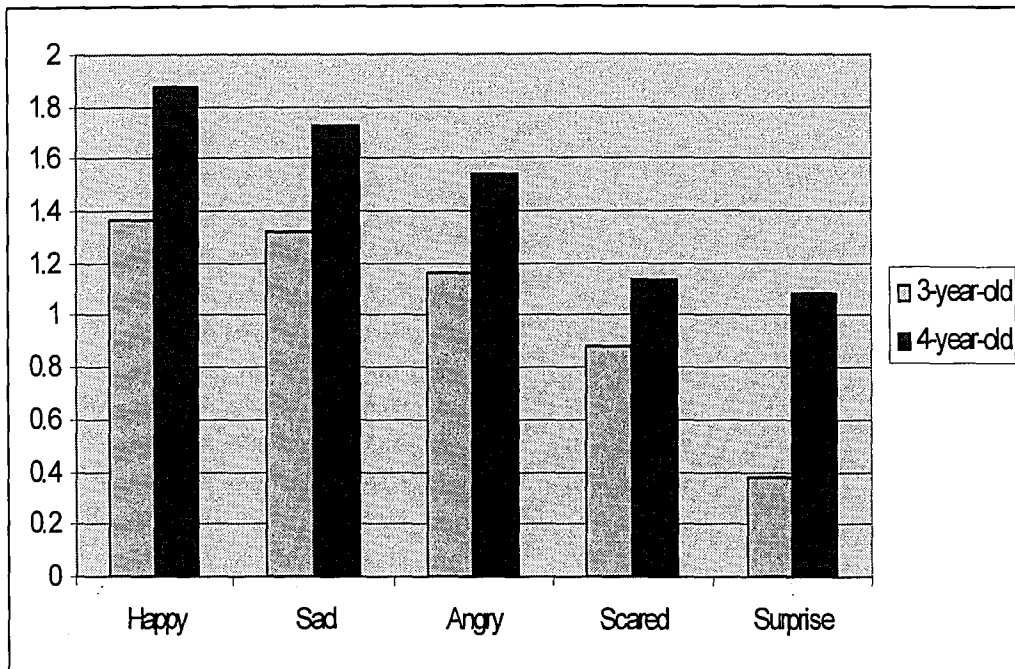


Figure 3. *Three- and four--year-olds labeling of specific emotions*

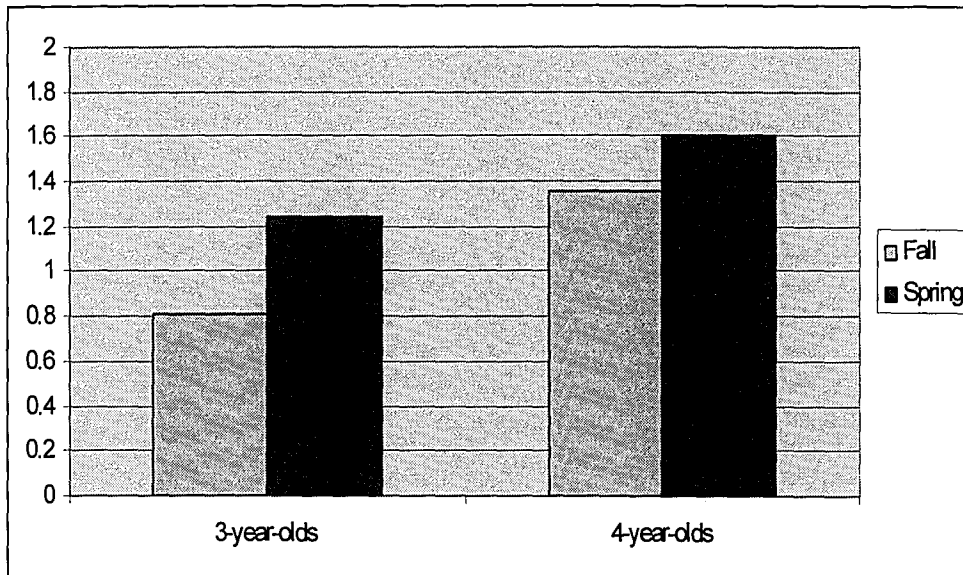


Figure 4. *Three- and four-year-olds labeling of emotion expressions from fall to spring*

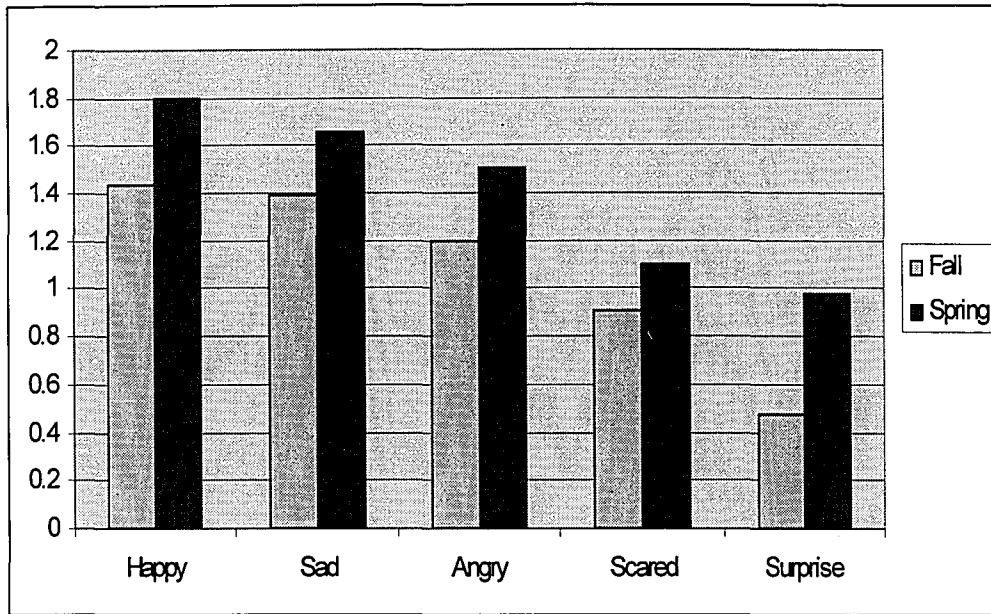


Figure 5. Children's labeling of specific emotions from fall to spring

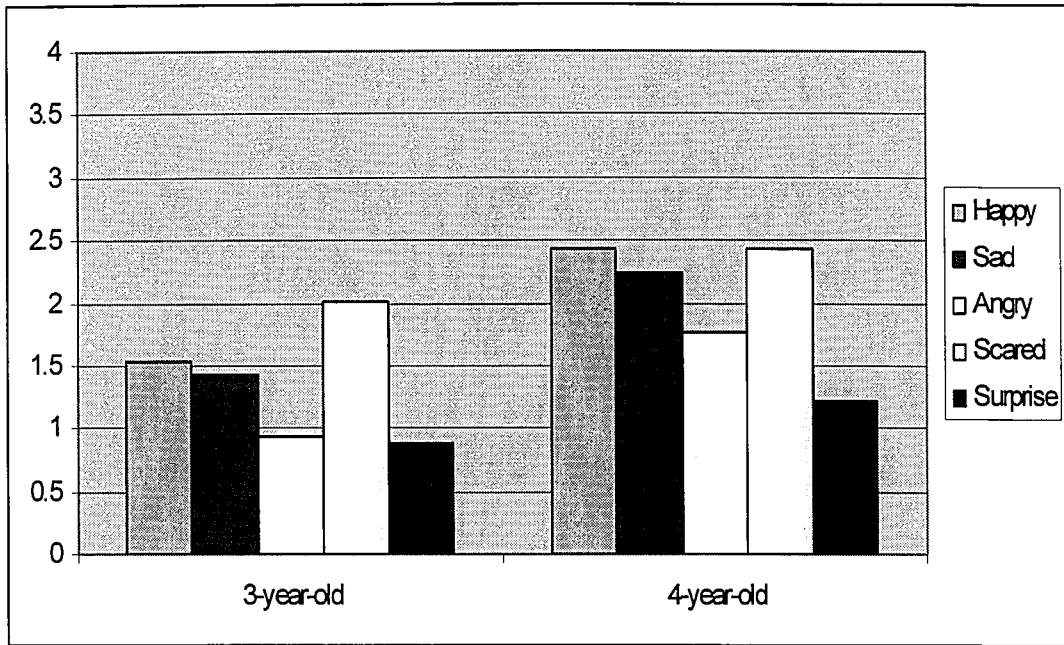


Figure 6. *Three- and four-year-olds' ability to provide causes for specific emotions*

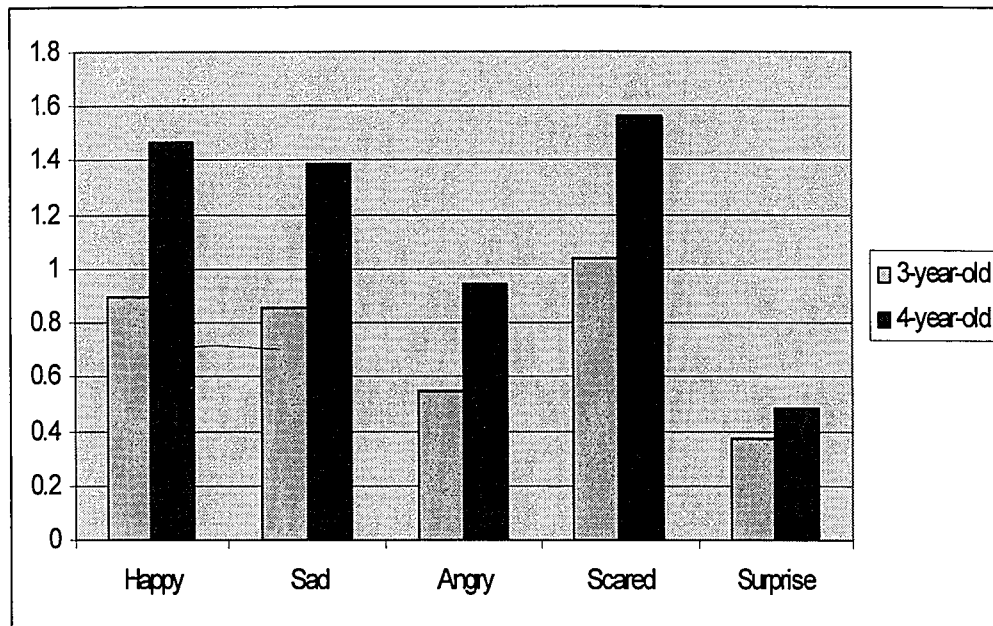


Figure 7. *Three- and four- year-olds' ability to provide consequences for specific emotions*

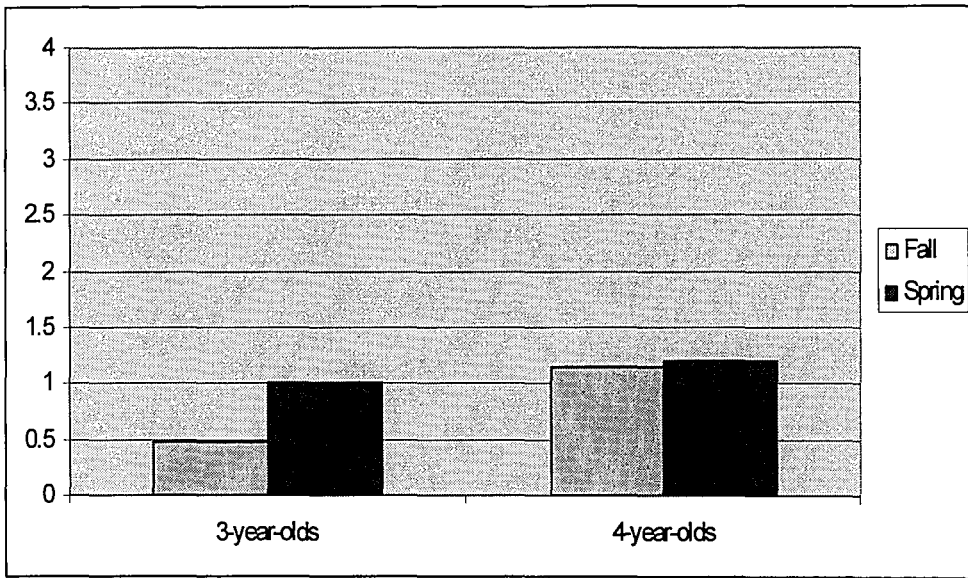
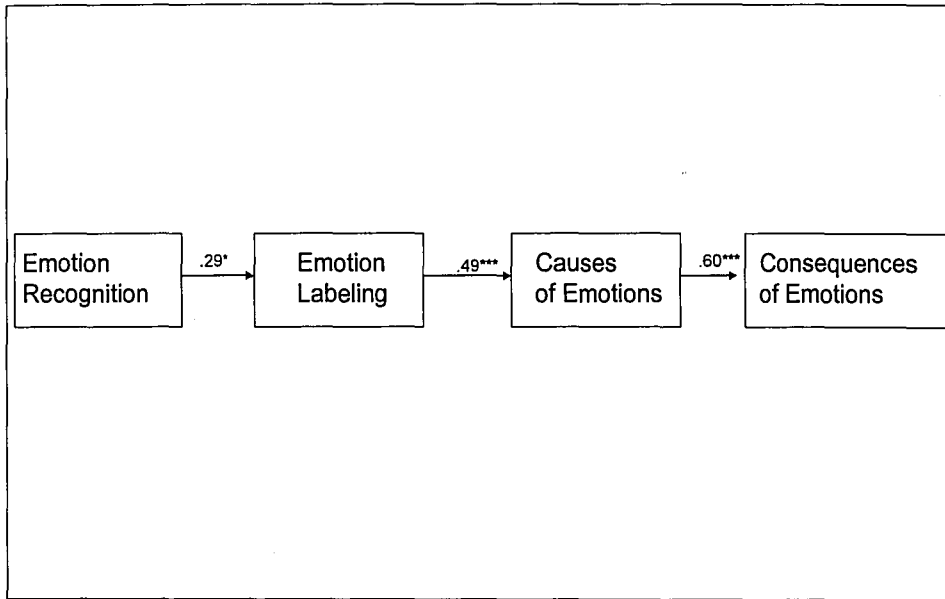
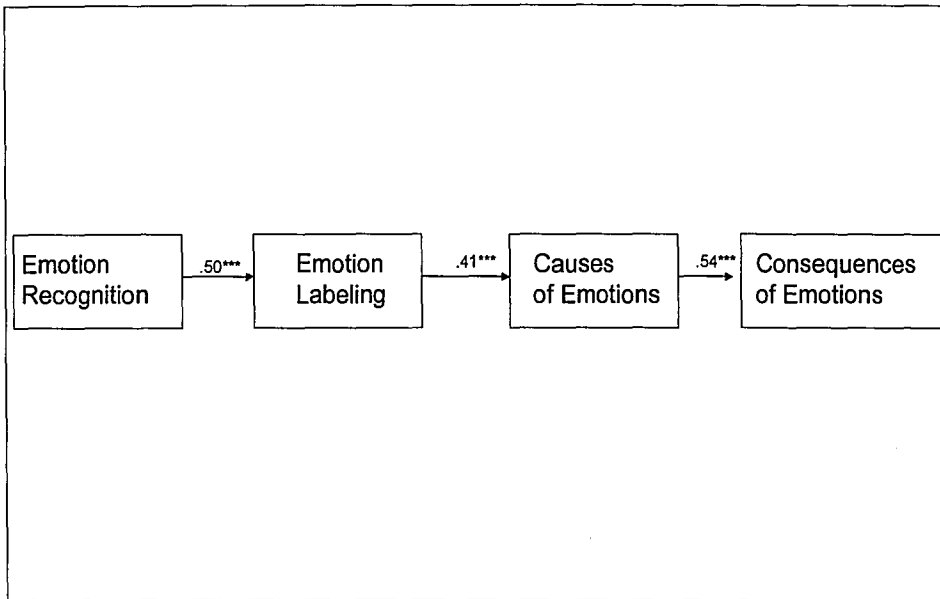


Figure 8. *Three- and four- year-olds' ability to provide consequences of emotions from fall to spring*



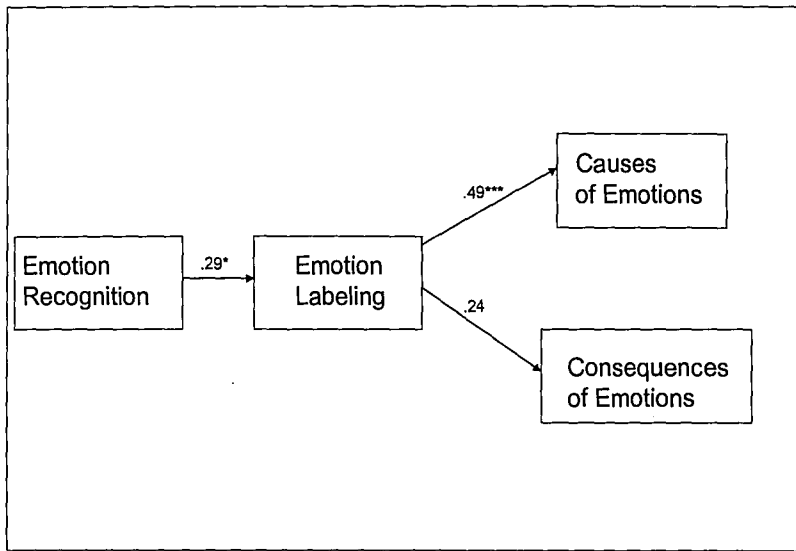
* $p < .05$; ** $p < .01$ and *** $p < .001$

Figure 9. *Linear model's standardized weights for 3-year-olds with concurrent data*



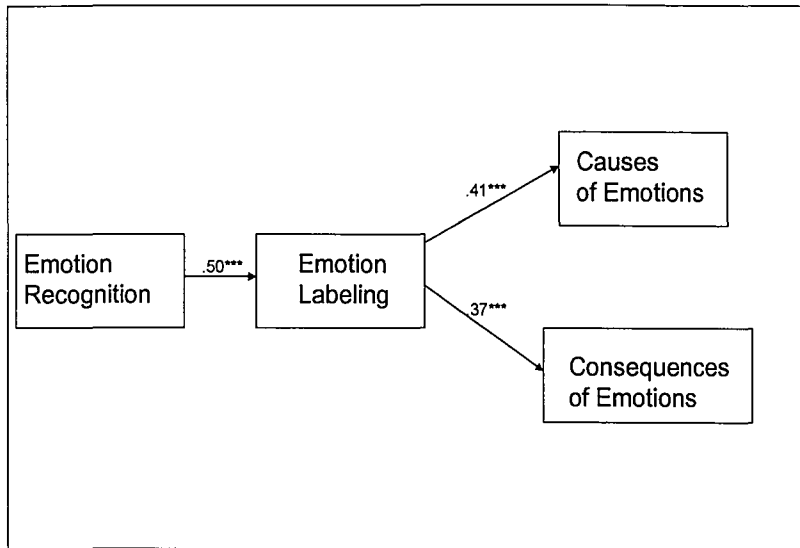
* $p < .05$; ** $p < .01$ and *** $p < .001$.

Figure 10. *Linear model's standardized weights for 4-year-olds with concurrent data*



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

Figure 11. *Non-Linear model's standardized weights for 3-year-olds with concurrent data*



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

Figure 12. *Non-linear model's standardized weights for 4-year-olds with concurrent data*

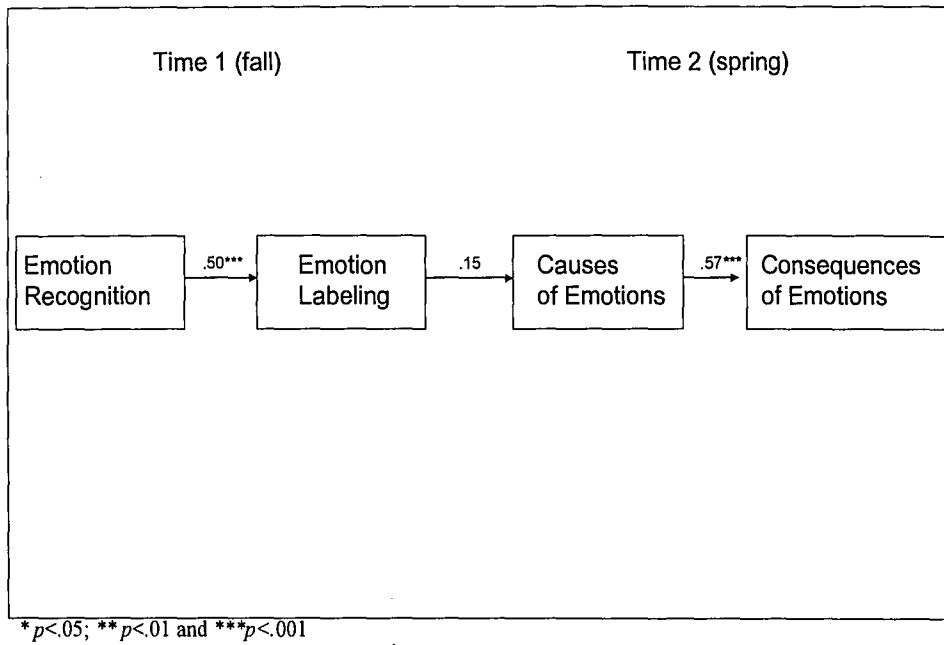
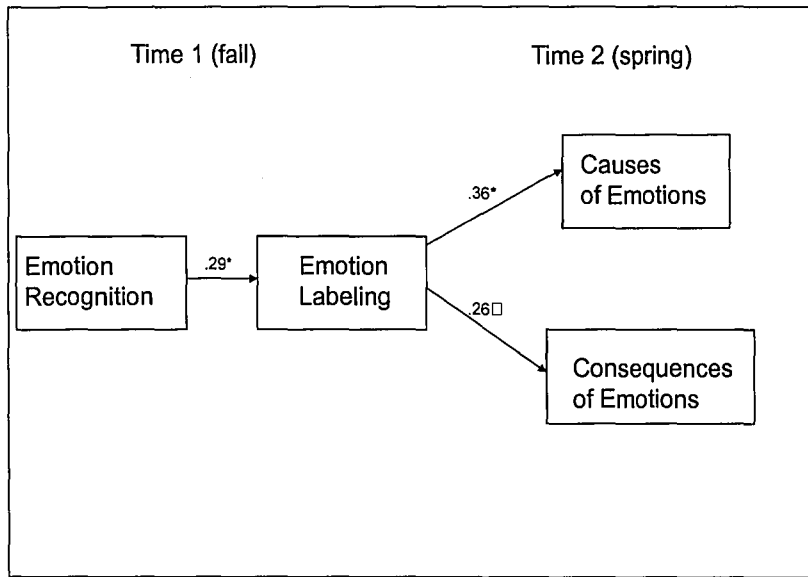
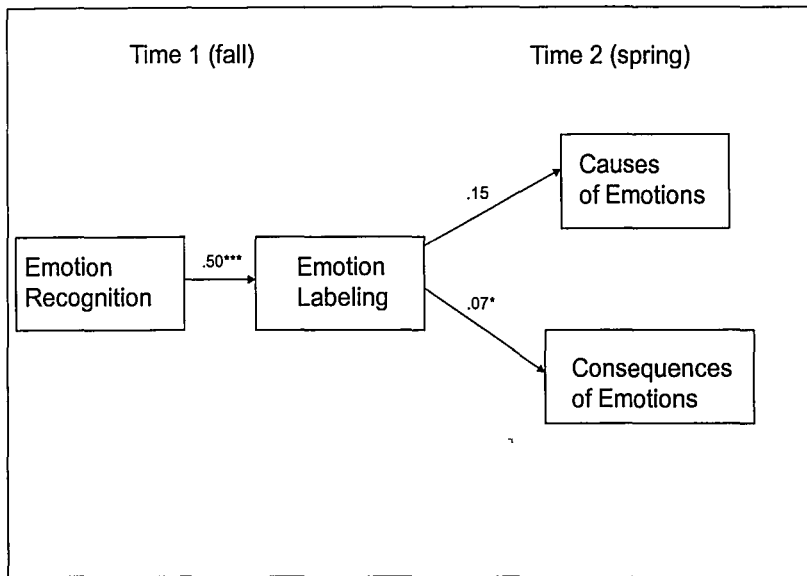


Figure 14. *Linear model's standardized weights for 4-year-olds with longitudinal data*



□ $p < .09$ * $p < .05$; ** $p < .01$ and *** $p < .001$

Figure 15. *Non-linear model's standardized weights for 3-year-olds with longitudinal data*



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

Figure 16. *Non-linear model's standardized weights for 4-year-olds with longitudinal data*

APPENDIX A

Child's Name: _____

Tester's Name: _____

Center Name: _____

Date of Test: _____

EMOTIONS TASK

Audiotape this task but also write down child's responses as much as you can.

Begin by saying "I am going to show you some pictures of children and I want you to tell me how they feel."

1. **Labeling Emotions Pictures (Comprehension)**

Place all five face pictures in a row in front of the child in the following order:
mad/angry, sad, happy, surprised and scared and then ask

Can you show me which child is _____ (emotion label)?

Place a **check**, if child responded correctly; **an X**, if child responded incorrectly. Do **NOT** correct the child's responses here. Be as neutral as you can.

Happy _____

Scared/Afraid _____

Sad _____

Surprised _____

Mad/Angry _____

2. **Labeling Emotions Pictures (Production), Plus Causes and Consequences**

Collect all the cards in your hand. Show or place one card at the time in front of the child and ask to give you the name for each card. You can say:

=> *Showing SAD picture*

How does this child feel? _____

After the child responds, say: (Or if the child does not provide the emotion term or provides the wrong one, you provide the right one, and then say):

"This child is sooo SAD... Let's pretend it's you.

Causes: What makes you feel SAD? _____

Probe *only* if child answers above question easily. **** (See general note at the end of next page)****

What else makes you feel SAD? _____

Consequences: When you feel SAD, what do you do?

Probe *only* if child answers above question easily.

Anything else (you do, when you feel
SAD?) _____

=> Showing *HAPPY* picture

How does this child feel? _____

“This child is sooo HAPPY... Let’s pretend it’s you.

Causes: What makes you feel HAPPY?

Probe *only* if child answers above question easily.

What else makes you feel

HAPPY? _____

Consequences: When you feel HAPPY, what do you do?

Probe *only* if child answers above question easily.

Anything else (you do, when you feel

HAPPY?) _____

=> Showing *SCARED (AFRAID)* picture

How does this child feel? _____

“This child is sooo SCARED (AFRAID)... Let’s pretend it’s you.

Causes: What makes you feel SCARED?

Probe *only* if child answers above question easily.

What else makes you feel SCARED?

Consequences: When you feel SCARED (AFRAID), what do you do?

Probe *only* if child answers above question easily.

Anything else (you do, when you feel

SCARED?) _____

=> Showing *MAD (ANGRY)* picture

How does this child feel? _____

“This child is sooo MAD(ANGRY)... Let’s pretend it’s you.

Causes: What makes you feel MAD?

Probe *only* if child answers above question easily.

What else makes you feel MAD?

Consequences: When you feel MAD(ANGRY), what do you do? _____

Probe *only* if child answers above question easily.

Anything else (you do, when you feel MAD?) _____

=> Showing *SUPRISED* picture

How does this child feel? _____

“This child is sooo SURPRISED... Let’s pretend it’s you.

Causes: What makes you feel SURPRIZED?

Probe *only* if child answers above question easily.

What else makes you feel SURPRISED? _____

Consequences: When you feel SURPRISED, what do you do? _____

Probe *only* if child answers above question easily.

Anything else (you do, when you feel SURPRISED?) _____

SOME GENERAL GUIDELINES ABOUT CAUSES AND CONSEQUENCES:

1. Ask child to tell you “another way” either for causes or consequences as long as the child produces the first response easily enough. If first response is not easily produced, do not probe.
2. Another way you can probe for causes is to say,
I bet you can tell me some more reasons why you feel sad...
3. If any of the responses are ambiguous or unclear, you can say, **Can you tell me more about _____?**

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PERSONAL HISTORY:

Date of Birth: February 2nd, 1981
Place of Birth: Fortaleza, Brazil
Parents: Abelardo de Sá Neto and Dinair A. B. De Sá

ACADEMIC HISTORY:

Lehigh University, Psychology PhD program, class of 2010
Universidade Federal Fluminense, Brazil, B.A, 2005, Psychology

LANGUAGES SPOKEN:

Portuguese, English and Spanish

RESEARCH INTERESTS:

My research interest lies on children's social and emotional development, more specifically, on how children's narratives and play might foster their social competence and emotion understanding. I'm also interested on identity formation of preschoolers and the role of gender during this period.

RESEARCH EXPERIENCE:

Story-Telling and Story-Acting- Lehigh Valley, 2005- present

Graduate Research Assistant: In a research funded by NICHD, tested and observed children from low-SES backgrounds within the preschool as well as maintained the intervention going within different preschool centers. Served as a contact between preschool teachers and project coordinators and trained undergraduate research assistant and other graduate research assistant on different tests and observations. Over the summer helped organize, form coding schemes, code and analyze data for the project.

Time for the Family Project (Projeto Tempo pra Familia), Niteroi, Brazil, 2003-2004

Intern/Research Assistant: Observed children, parents and teachers during the first month of children's adaptation in a university preschool school with the majority of children from low-SES background. After the first couple of months of observations, conducted interview with parents and teachers and later acted as a contact for parents and teacher. Assisted teachers with planning for activities and conducted training for teachers from the public education system in the city.

No Land Project (Projeto Sem Terra), Paraty, Brazil, 2003

Research Assistant: Interviewed migrant low-SES migrant children in the state of Rio de Janeiro.

Life on Campus Project (Projeto Vida no Campus), Niteroi, Brazil, 2002

Research Assistant: Conducted interviews with students, faculty and staff on campus, as well as observations in the day care and interview with parents and teachers.

CONFERENCE PRESENTATIONS:

Sa, A. & Nicolopoulou, A. (2008) *Gender differentiation pattern for gendered narrative styles, partner preferences, and stereotypic role adaptation*. Poster presented at the Third Gender Development Research Conference (San Francisco, CA, April 11-12).

Nicolopoulou, A., Ilgaz, H., Brockmeyer, C., Schewebel-Cortina, K. & Sa, A. (2008)

Sa, A. (2007) *Promoting Social Understanding and Social Competence in Low-Income Preschoolers through a Storytelling and Story-Acting Activity*, Symposium presented at the 7th Annual Cross University Collaborative Mentoring Conference (New York, NY, May 4-5).

Vasconcellos, V. & Sa, A. (2006) *Play and imitation in peer interactions*, Symposium presented at the Annual Jean Piaget Society Meeting (Baltimore, MD, June 1-3).

Vasconcellos, V., Lopes, J. & Sa, A. (2004) *Migration of Children: Understanding Space and Place*, In: *Development in poverty-stricken contexts*. Symposium presented at the Annual Jean Piaget Society Meeting (Toronto, Canada, June 3-5).

Borba, A & Sa, A. (2003) *Childhood, play and culture*, Symposium presented at the Annual Meeting of Jean Piaget Society Meeting (Chicago, IL, June 1-3).

Borba, A. & Sa, A. (2003). *Contemporary issues on childhood play and culture*, Annual Brazilian Meeting of Developmental Psychology. (Joao Pessoa, Brazil, May 15-17).

**END OF
TITLE**