

THE UNIVERSITY OF CALGARY

Emotion Recognition, Attributional Bias, and Reported  
Caregiving Behaviors in Mothers At-Risk for Abuse  
and Nonabusive Mothers

by

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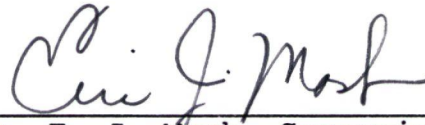
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THE UNIVERSITY OF CALGARY  
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled, "Emotion Recognition, Attributional Bias, and Reported Caregiving Behaviors in Mothers At-Risk for Abuse and Nonabusive Mothers," submitted by Patricia Kelly Marchand in partial fulfillment of the requirements for the degree of Master of Science.



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## ABSTRACT

Several factors, such as caregiver affect, cognitions, and behaviors, may be important in understanding why some parents do or do not respond sensitively to their children. As an initial attempt to understand the complex process of parenting, the present study examined the relationships among depression, empathy, emotion recognition abilities, attributions, and reported caregiving behaviors in mothers at-risk for physical abuse and control mothers.

Fourteen at-risk mothers and 47 control mothers were compared on a number of dimensions. Maternal depression and empathy were assessed using the CES-D Scale and the Interpersonal Reactivity Index, respectively. To assess emotion recognition abilities, mothers viewed and rated videotaped segments of infants' positive and negative facial expressions. Mothers' attributions concerning locus of causality and intentionality of their children's behaviors were assessed after they had listened to four hypothetical vignettes describing positive and negative child behaviors. Mothers' likely reactions to these hypothetical behaviors were assessed using a checklist comprised of a variety of caregiving responses.

Two significant group differences were found. First, at-risk mothers were significantly more depressed than control mothers. Second, at-risk mothers were more likely to have a negative attributional bias for the causes of

their children's hypothetical positive and negative behaviors. A path analytic strategy was used to examine the relationships among the constructs of interest. This approach revealed that higher levels of affective empathy were associated with more nurturant reactions and more positive causal attributions for the children's behaviors. As well, emotion recognition abilities were positively associated with maternal nurturance. Higher levels of education were also associated with less punitive and intrusive reactions to infants' hypothetical behaviors. Also, the more educated a mother was, the less likely she was to be at-risk for physical abuse.

These findings were discussed in terms of limitations of the present study, recommendations for future research, and implications for the treatment of physically abusive mothers.

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## Introduction

Recent efforts to understand parent-child interactions have gone beyond simple descriptions of behaviors to also include the role of parental cognitions and affect (e.g., Goodnow, 1988). This interest in parental cognitions and affect stemmed from the premise that there should be a relationship between the way in which parents think and feel about their children and how they interact with them (e.g., Miller, 1988). One model which examines the relationship between the cognitive and behavioral components of parent-child interactions has been proposed by Lamb and Easterbrooks (1981) in order to explain how parents respond sensitively to their children's expressions of emotions. According to this model, a sensitive caregiver (1) first has to recognize the child's expression, (2) then interpret the expression correctly, and (3) then select an appropriate response and implement that response effectively. Difficulty at any of these steps may result in an insensitive response on the part of the caregiver.

Lamb and Easterbrooks' model (1981) is depicted in Figure 1. For the purpose of the present study, emotion recognition refers to the first step of Lamb and Easterbrooks' model (1981) in which the parent recognizes the child's expression. Maternal attributions refer to the second step, in which the parent interprets the meaning of

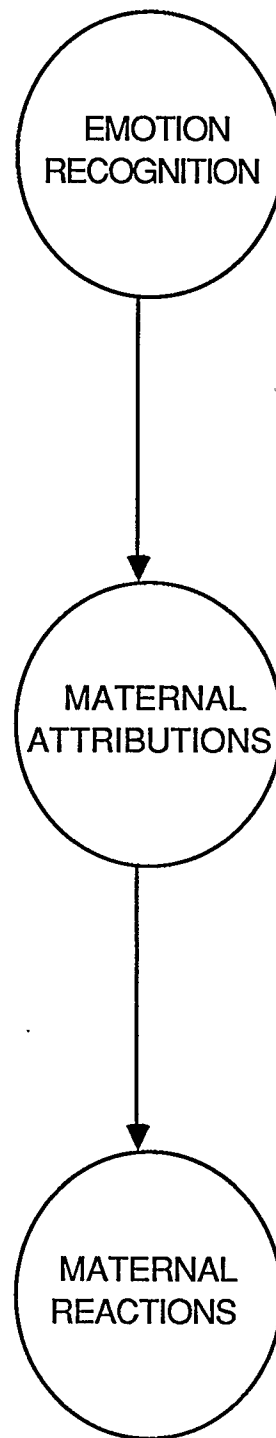


Figure 1. Lamb and Easterbrooks' model of sensitive caregiving.

the child's expression. Maternal reactions refer to step 3 in which the parent selects an appropriate response and implements that response effectively.

Affective variables such as depression and empathy have been shown to influence how parents recognize, interpret, and react to their children's behaviors (e.g., Field et al., 1985; Wiesenfeld, Whitman, & Malatesta, 1984). In light of this, there is a need to further examine the relationships among maternal depression, empathy, emotion recognition abilities, attributions, and reactions. Figure 2 illustrates Lamb and Easterbrooks' model (1981) with the addition of maternal depression and empathy as possible moderating variables. In Figure 2, depression and empathy are shown to have a potential influence on all three steps of the model: emotion recognition, attributions, and reactions.

The purpose of the present study was twofold. The first was to identify possible differences between a group of mothers who were at-risk for physically abusing their children and a group of nonabusive mothers on emotion recognition abilities, attributions, reactions to their children's behaviors, depression, and empathic abilities. Research supports the notion that child abuse constitutes a case of insensitive parenting and if factors such as emotion recognition, attributions, and reactions are important for sensitive responding, deficits for these

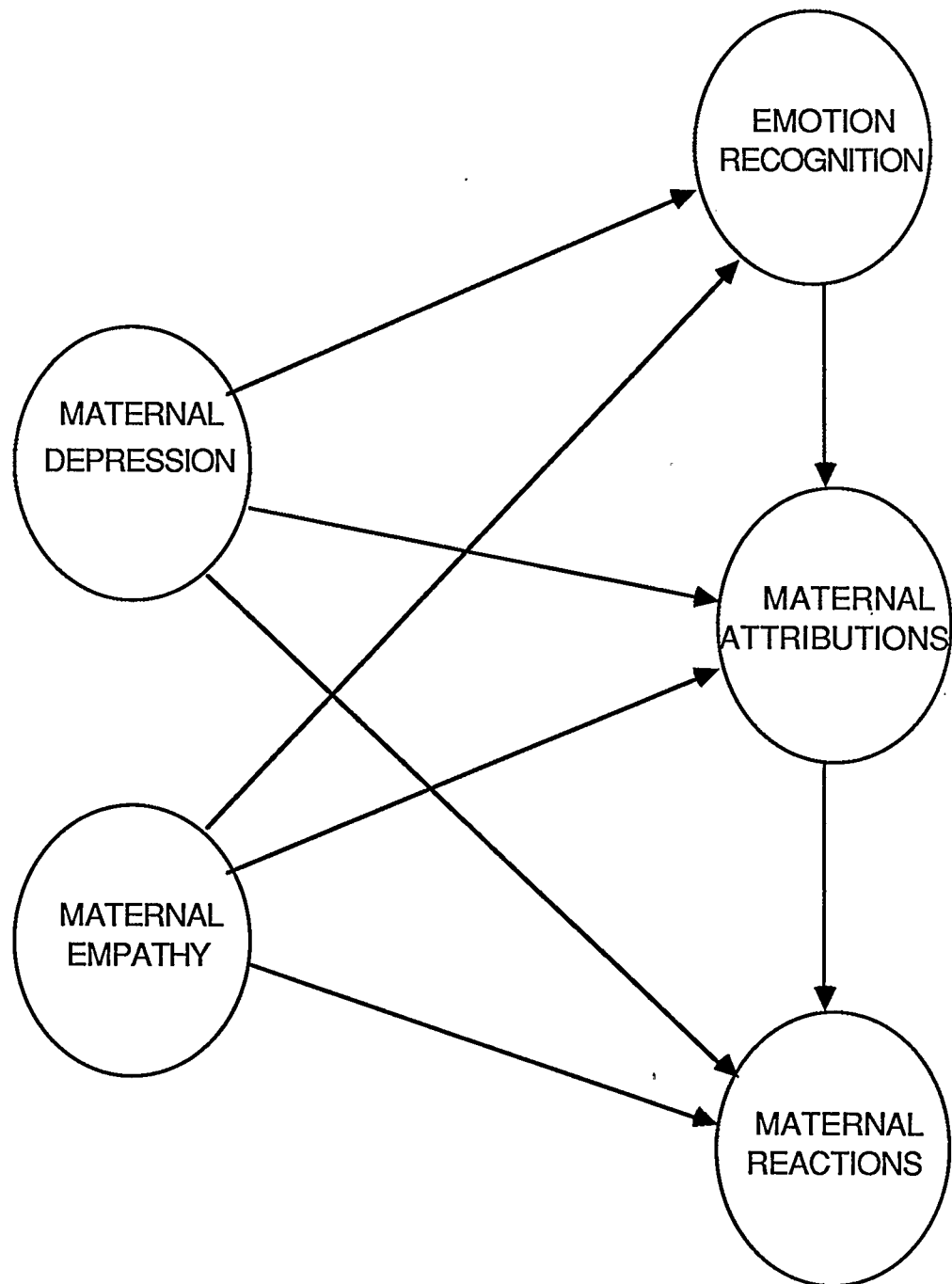


Figure 2. Addition of depression and empathy to Lamb and Easterbrooks' model.



factors would be predicted in an abusive population. Understanding abusive parents' deficits may have important implications for intervention and treatment. In addition, the investigation of an atypical group of mothers can make significant contributions to a theory of normal mother-child interactions, primarily by affirming it, challenging it, and requiring a more fully integrated theory that can account for both normal and deviant processes (Cicchetti & Braunwald, 1984).

The second purpose of this study was to examine the relationships among emotion recognition, attributions, reactions, depression, and empathy for at-risk and control mothers. A general model depicting the relationships among these six major constructs is shown in Figure 3. Specifically, at-risk versus control group membership was hypothesized to influence maternal depression and empathy. Maternal depression and empathy were hypothesized to influence emotion recognition, attributions, and reactions to child behaviors. Emotion recognition was hypothesized to influence the types of attributions mothers made about their children's behaviors. Finally, maternal attributions concerning their children's behaviors were hypothesized to influence the ways in which mothers reacted to those behaviors.

The following sections will summarize what is known about the relationships depicted in Figure 3 by describing

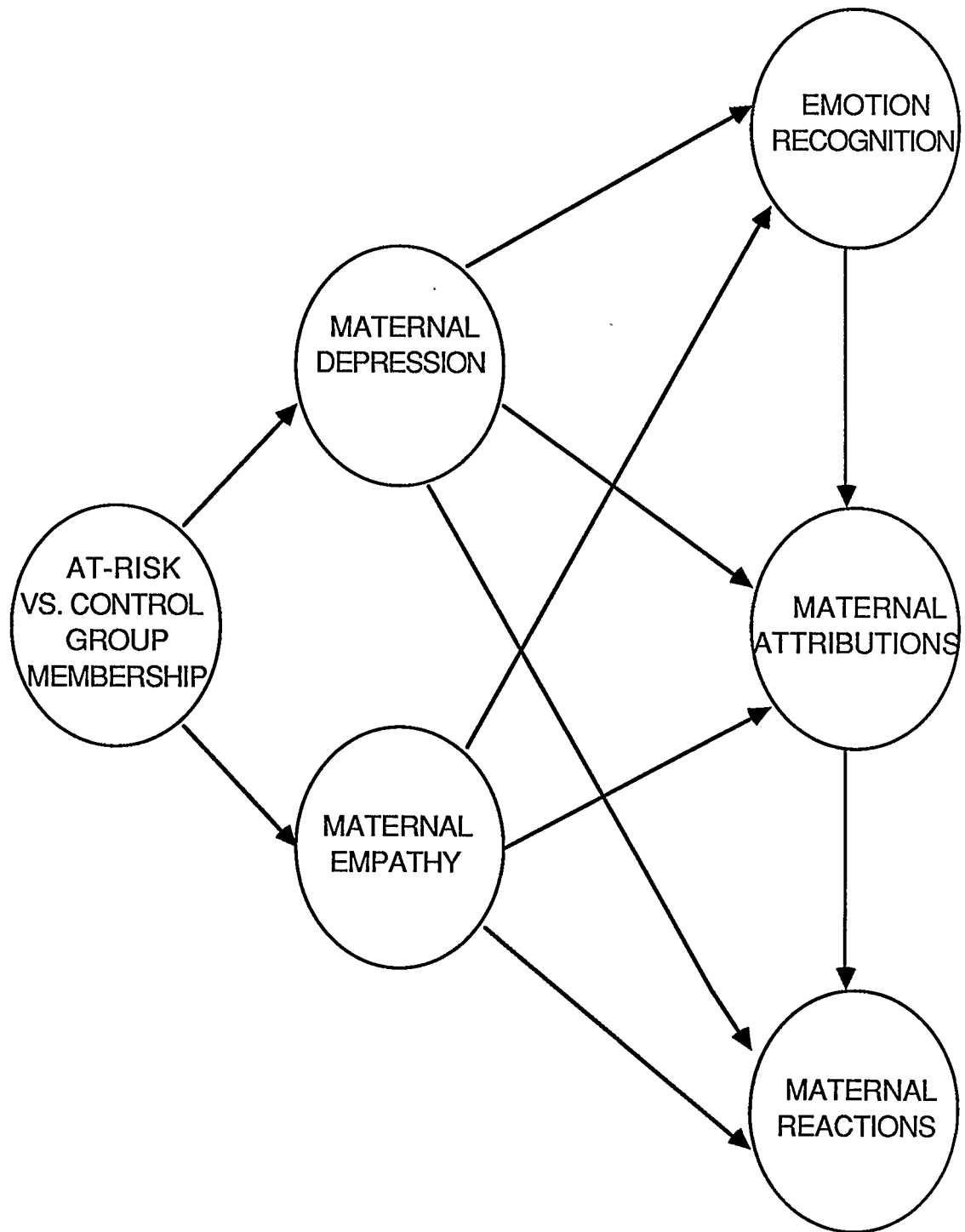


Figure 3. Hypothesized relationships among variables with the addition of group membership.

the research findings for the constructs of emotion recognition, attributions, reactions, and their interrelationships with depression and empathy. First, research concerning the emotion recognition abilities of physically abusive and control mothers will be provided followed by a review of the relationship between depression and emotion recognition, and empathy and emotion recognition. Next, research concerning abusive and nonabusive mothers' attributions for their children's behaviors will be discussed as well as the interrelationships of depression and empathy with attributions. Finally, the reactions of physically abusive and nonabusive mothers to their children's behaviors will be summarized followed by an examination of the relationship between depression and maternal reactions, and empathy and maternal reactions.

#### Emotion Recognition

One important aspect of mother-infant interactions centres around the infant's display of emotion signals (Kropp & Haynes, 1987). According to Izard (1978), various emotion signals in infants have evolved primarily because they elicit different maternal responses which are functionally appropriate to each emotion-eliciting event. A sensitive and responsive mother-infant relationship would be one in which the mother correctly identified the infant's facial expressions and responded to those signals

appropriately.

According to Ekman and Friesen (1982), facial expressions are biologically based, involuntary signs of felt emotions, and are universal. Although discrete expressions in neonates and older infants have been documented, many theorists defer the emergence of feeling states in infants until several months into development, or even later, due to the cognitive immaturity of the infant. However, Izard, Huebner, Risser, McGinnes, and Dougherty (1980) have documented the existence of facial patterns of interest, joy, surprise, sadness, anger, disgust, and fear in infants from 1 to 9 months of age. Campos (1984) stated that facial expressions of happiness, surprise, fear, and anger have been documented in infants at 1, 4, and 7 months of age. Camras (1987) reported that an infant who had been videotaped by a caretaker during the first eight weeks of life, exhibited the same facial patterns as those described by Izard et al. (1980), except for the expression of fear.

To date, three studies have compared the emotion recognition abilities of physically abusive and nonabusive mothers. Kropp and Haynes (1987) assessed 20 abusive and 20 nonabusive mothers' ability to recognize emotion signals in infants and found that abusive mothers did not differentiate emotion signals as well as nonabusive mothers. Also, abusive mothers were more likely to label negative affect as positive (e.g., fear signal labelled as

surprise). In contrast to Kropp and Haynes, Camras et al. (1988) and During (1986) found that abusive and nonabusive mothers recognized emotions equally well; both the Camras et al. (1988) and During (1986) studies used similar stimulus materials which consisted of a variety of posed facial expressions of older children.

There are a number of possible reasons for the discrepancy of findings in these three studies. First, in the Kropp and Haynes (1987) study, the slides were of infants' expressions as opposed to child expressions used in the Camras et al. (1988) and During (1986) studies. It could be that posed facial expressions of older children are easier to recognize and therefore, emotion recognition differences between physically abusive and nonabusive may be less apparent. Second, in the Camras et al. and During studies, the stimuli were of frontal-view poses and were clearly visible, whereas in the Kropp and Haynes study, the stimuli were photographed from a video monitor with the faces presented at various angles. According to Camras et al. (1988), the inconsistency across the studies may suggest that the emotion recognition abilities of abusive mothers are influenced by the stimuli. When the emotion signals are unambiguous and posed, abusive mothers may be capable of recognizing emotion stimuli just as well as nonabusive mothers (e.g., as in the Camras et al. and During studies). However, abusive mothers may have

difficulty recognizing more ambiguous emotion stimuli obtained from active infants (e.g., as in the Kropp and Haynes study).

Depression and emotion recognition. Studies have shown that physically abusive mothers are often more depressed than nonabusive mothers (e.g., Evans, 1980; Lahey, Conger, Atkeson, & Treiber, 1984; Mash, Johnston, & Kovitz, 1983), and depression has been shown to affect emotion recognition abilities in depressed adults. For example, Zuroff and Colussy (1986) found that a group of depressed adult female inpatients were less accurate than nondepressed females when shown photographs of posed emotions by adults and also, when the emotions were positive, depressed females were more likely to be incorrect. Shannon (1971) found that depressed adult male inpatients were less accurate than nondepressed males in identifying facial expressions of fear and anger. Walker, McGuire, and Bettles (1984) found that a group of male and female depressives were somewhat, but not significantly, less accurate than a nondepressed control group in recognizing adults' facial expressions. Finally, Feinberg, Rifkin, Schaffer, and Walker (1986) found that a group of adult male and female depressives were less accurate than nondepressives on an emotion recognition task using adults' facial expressions. Although the emotion recognition abilities of depressed mothers has yet to be investigated,

the findings from research with depressed adults suggest that the emotion recognition abilities of mothers would be impaired if they were depressed.

Empathy and emotion recognition. In the context of parent-child interactions, empathy has been conceptualized as being an important mediating variable that affects parental sensitivity to a child's cues (e.g., Wiesenfeld et al., 1984). Empathy can best be understood as a multidimensional construct which includes the cognitive ability to take another person's perspective and the affective ability to react emotionally to another person's plight (Chlopan, McCain, Carbonnell, & Hagen, 1985; Davis, 1980).

Although empathy can be assessed using self-report indices, many studies have used physiological measures to assess parental empathic reactions to infants' differing emotional states. For example, Wiesenfeld et al. (1984) examined the physiological arousal and emotional reactions of women who varied in their self-reported levels of empathy. Subjects were shown videotapes of infants' smiling, crying, and neutral facial expressions. It was found that the high empathy group showed greater average heart rate changes to the emotionally valenced stimuli than to the neutral expressions as compared to the low empathy group. Also, the high empathy group reported feeling significantly sadder while watching a videotape of an

infant crying and were more likely to report that they would pick up the infant. Wiesenfeld et al. (1984) concluded that their results supported the hypothesis that high-empathy individuals were more emotionally responsive to infant emotional cues.

There is evidence that abusive parents exhibit deficits in empathy, as defined by their differential physiological responses to varying emotional stimuli. For example, Frodi and Lamb (1980) presented abusive and nonabusive parents with videotaped stimuli of crying and smiling infants. Abusive parents responded to both the cry and smile expressions with annoyance and physiological arousal; Frodi (1985) commented that these abusive parents responded as if positive and negative child social signals were equally aversive to them. In contrast, Frodi and Lamb (1980) found that nonabusive parents were physiologically aroused by the crying infant but experienced a decrease in arousal in response to the smiling infant. Similar findings were reported by Doerr, Disbrow, and Caulfield (1977) who measured physiological arousal in abusive and nonabusive parents in response to child-related stressful and pleasant scenes. They found that heart rate increased for nonabusive parents as the scene changed from pleasant to unpleasant whereas abusive parents' heart rates remained at an elevated level independent of the affect displayed in the scenes. Finally, in a study by Wolfe, Fairbank, Kelly,



and Bradlyn (1983), abusive and nonabusive mothers were shown videotaped scenes involving stressful and nonstressful child behaviors. They found that nonabusive mothers responded with little physiological arousal to either the stressful or nonstressful scenes. Abusive mothers were more highly aroused than nonabusive mothers for both the stressful and nonstressful scenes.

To summarize, women low in empathy and abusive parents were more likely to be physiologically undifferentiated in response to positive and negative child-related stimuli (e.g., Frodi & Lamb, 1980; Wiesenfeld et al., 1984). In contrast, women high in empathy and nonabusive parents showed greater physiological differences between positive and negative child stimuli suggesting that these women were more empathic to the children's signals compared to women low in empathy and abusive parents.

#### Maternal Attributions

The role of parental cognitions in parent-child interactions has only recently been given serious attention (e.g., Sigel, 1985). The types of parental cognitions researched have been heterogenous and have included such areas as parental values and attitudes (e.g., Gaines, Sandgrund, Green, & Power, 1978), parental knowledge and belief systems (e.g., Sigel, 1985), parental self-esteem (e.g., Johnston & Mash, 1989), and parental attributions (e.g., Larrance & Twentyman, 1983). The following

discussion will focus on parental attributions concerning the causes and intentionality of their children's positive and negative behaviors.

Dix and Grusec (1985) define attribution theory as an information-processing approach which stresses that social behavior depends on the ongoing assessment of persons and behavior. According to Dix and Grusec (1985), attribution theory suggests that parenting behavior depends on parents' inferences about the traits and motives of their children, the situational forces operating on their children, and the causes of their children's behavior (internal factors, external factors, or a combination of both). Also, it can be postulated that parents' attributions about their children's behavior will be positively biased since an increasing degree of acquaintanceship with a person is associated with an increasingly positive view of that person (Taylor & Koivumaki, 1976). Mothers exhibit a positive bias when they attribute their children's positive behaviors to internal/stable influences and their children's negative behaviors to external/unstable influences.

Support for a positive attributional bias in nonabusive parents can be found in studies by Dix, Ruble, Grusec, and Nixon (1986) and Gretaarsson and Gelfand (1988). Dix et al. (1986) found that parents consistently viewed children's altruism as more intentional and stable than

children's misconduct. Likewise, Gretarsson and Gelfand (1988) found that mothers were more likely to attribute their children's positive characteristics to internal/dispositional influences and their children's negative characteristics to external influences. Also, mothers reported more stability for their children's positive traits. However, Gretarsson and Gelfand (1988) found that a positive parental bias is not invariant; when a child was perceived as difficult by the mother, she was more likely to view that child's negative characteristics as dispositional.

Not only is the positive parental bias variant within a nonabusive population, it is also variant across parent populations. For example, several studies have reported a lack of positive parental bias in abusive mothers. Larrance and Twentyman (1983) assessed the attributions of 10 physically abusive and 10 nonabusive mothers and found that physically abusive mothers made more internal and stable attributions for their children's negative behaviors; Larrance, Amish, Twentyman, and Plotkin (1982) found that the severity of the mother's abusiveness (as rated by her counsellor) was significantly correlated with her tendency to see her child's negative behaviors as internally caused ( $r = .89$ ) and stable over time and situation ( $r = .85$ ). Larrance and Twentyman (1983) also found that abusive mothers made external and unstable

attributions when their children were successful.

Nonabusive mothers did not show this pattern; instead, when their children failed or transgressed, they made external or unstable attributions and when their children were successful, they made internal and stable attributions.

Bauer and Twentyman (1985) found that relative to nonabusive mothers, abusive mothers consistently attributed more malevolent intentionality to their children's negative behavior. One study, by Rosenberg and Reppucci (1983), found no significant group differences between abusive and nonabusive mothers' attributions of intent and disposition for their children's behaviors. However, these results may have been a function of the fact that the control group consisted of mothers who were themselves experiencing "problems in parenting."

Although maternal attributions were not assessed directly, two studies provide additional support that abusive mothers view their children negatively compared to nonabusive mothers. Mash et al. (1983) and Reid, Kavanagh, and Baldwin (1987) had physically abusive and nonabusive mothers complete the Child Behavior Checklist (Achenbach & Edelbrock, 1981). Mash et al. (1983) found that abusive mothers rated their children as significantly more problematic with respect to both internalizing and externalizing problems. Reid et al. (1987) found that abusive mothers rated their children as more aggressive and

hyperactive. However, in both of these studies when the abused and nonabused children were observed by independent raters, no significant differences in their behaviors were found.

Taken together, these studies support the view that most nonabusive mothers have a positive attributional bias for their children's behavior (except when the child is perceived as difficult). On the other hand, abusive mothers are more likely to view their children's negative behaviors as dispositionally caused, and their positive behaviors as situationally caused.

Depression and maternal attributions. A primary assertion of cognitive theories of depression is that individuals who are depressed are more negative or pessimistic than individuals who are not depressed (e.g., Beck, Rush, Shaw, & Emery, 1979). According to Brody and Forehand (1986) and Patterson (1982), this pessimism can apply to how a mother perceives her child's functioning. In fact, several studies have found that the more depressed a mother was, the more likely she was to perceive her child as behaviorally aversive (e.g., Panaccione & Wahler, 1986; Rickard, Forehand, Wells, Griest, & McMahon, 1981; Webster-Stratton, 1988; Webster-Stratton & Hammond, 1988).

Several studies that have investigated whether children of depressed mothers were more behaviorally aversive than children of nondepressed mothers have found

no significantly distinguishable differences between the two groups (e.g., Christensen, Phillips, Glasgow, & Johnson, 1983; Griest, Wells, & Forehand, 1979; Rogers & Forehand, 1983). Nevertheless, compared to control mothers, the depressed mothers perceived their children more negatively. Forehand, Lautenschlager, Faust, and Graziano (1986) tested the relationships among maternal depression, maternal perceptions, and child behaviors using path analysis and found that a higher level of depressive mood was associated with greater maternal perceptions of child maladjustment. The addition of a path between child behavior and maternal perceptions of child maladjustment did not improve the model, which supports the view that child behaviors may have very little impact on maternal perceptions.

In contrast, Brody and Forehand (1986) found that there was a significant interaction between child's behavior and maternal depression. They found that children were perceived more negatively when they displayed high rates of noncompliant behavior and their mothers reported high levels of depression. Lee and Gotlib (1989) propose that rather than depression affecting mothers' perceptions of their children, maternal psychological disturbance affects children's internalizing behavior and thus, depressed mothers are accurately perceiving their children's behaviors. They found that depressed mothers

described their children as having significantly more internalizing problems, and their children also reported having more internalizing problems. Therefore, the depressed mothers accurately perceived their children's behaviors.

To summarize, studies have consistently shown that depressed mothers view their children more negatively compared to nondepressed mothers. According to some researchers, depressed mothers are not negatively biased in their perceptions since children of depressed mothers have more problems (Lee & Gotlib, 1989). However, several studies have failed to find significant behavioral differences in children of depressed and nondepressed mothers, and contend that actual child behaviors may be unimportant to the perceptions of depressed mothers (e.g., Christensen et al., 1983; Forehand et al., 1986; Griest et al., 1979).

Empathy and maternal attributions. Zuckerman (1979), in a review of the attribution literature, noted that people tend to make self-serving attributions: they feel responsible for good outcomes and victims of circumstance when something goes wrong. This bias usually does not occur when a person makes attributions about other people's behaviors especially if they are strangers, competitors, or disliked (Forsyth & Schlenker, 1977). However, Gould and Sigall (1977) and Melburg, Rosenfeld, Riess, and Tedeschi

(1984) demonstrated that empathy towards another person leads to the sharing of self-serving attributions. Specifically, Gould and Sigall (1977) and Melburg et al. (1984) found that subjects given empathy instructions tended to make environmental attributions for a stranger's poor performance and dispositional attributions for a stranger's success; subjects given nonempathy observation instructions did not make self-serving attributions for the stranger's behaviors. Empathy has also been found to influence the accuracy with which a stranger is perceived. For example, Bernstein and Davis (1982) found that subjects high in perspective-taking ability, a component of empathy, were more accurate in their perceptions of a stranger than subjects low in perspective-taking ability. The influence of empathy on abusive mothers' perceptions of their children has yet to be investigated, but Larrance et al. (1982) hypothesize that mothers with a capacity for empathy would be more likely to share a self-serving attributional bias with their children.

### Maternal Reactions

The most frequently noted aspect of normal mother-infant interactions is the rhythmic cycling of activity between mother and infant (Crittenden, 1981). Several researchers have stressed the importance of a mother's attentive and responsive behavior for the development of her infant (Belsky, 1980; Izard, 1978; Lamb



& Easterbrooks, 1981). For example, through contingent and sensitive maternal behavior, the infant develops some form of trust with the mother (Lamb & Easterbrooks, 1981), and is more securely attached (e.g., Belsky, Rovine, & Taylor, 1984; Egeland, Deinard, Brunquell, Phipps-Yonas, & Crichton, 1979; Smith & Pederson, 1988).

Several studies have found differences in attentive and responsive behavior when observing abusive and nonabusive mothers interacting with their children (see review by Wolfe, 1985). Dietrich, Starr, and Kaplan (1980) report that compared to nonabusive mothers, abusive mothers were less involved, more passive, and more restraining in a play situation with their infants. Also, abusive mothers were more likely to interrupt and interfere with their infants' activities (Crittenden, 1981; Egeland et al., 1979; Lyons-Ruth, Connell, Zoll, & Stahl, 1987). In fact, abusive mothers appeared to be planning their behaviors internally, and largely without reference to their children's behaviors (Crittenden, 1981; Mash et al., 1983). Therefore, the data suggest an inability on the part of abusive mothers to track behaviors correctly and to interact reciprocally with their children. On the other hand, nonabusive mothers have been shown to respond contingently to their children's behaviors and to enjoy interacting with them.

Not only were abusive mothers found to be less

responsive to their children, they were also more likely to engage in aversive behavior as opposed to prosocial behavior with family members. For example, Burgess and Conger (1978) and Bousha and Twentyman (1984) found that compared to nonabusive mothers, abusive mothers initiated fewer overall contacts in the home environment, even fewer positive contacts, and considerably more negative contacts. Kavanagh, Youngblade, Reid, and Fagot (1988) reported that abusive parents showed significantly less positive parenting than nonabusive parents and were more likely to ignore their children's initiations of interaction. This finding is consistent with Egeland et al.'s (1979) finding that abusive mothers interacted in such a way that precluded reciprocity even when infants tried to initiate a social interaction.

The ways in which abusive mothers react to negative child behaviors has been the focus of much research. Studies involving hypothetical child transgressions found that abusive mothers were more likely to endorse the use of physical punishment whereas nonabusive mothers were more likely to use cognitive or nonpunitive tactics such as reasoning or distraction (Disbrow, Doerr, & Caulfield, 1977; Letourneau, 1981). Trickett and Susman (1988) asked abusive and nonabusive parents to report how frequently they used eight disciplinary techniques. They found that abusive parents were more likely to use verbal and material

punishment compared to control parents who were more likely to use reasoning. Also, abusive mothers endorsed a greater belief in the value of spanking compared to abusive fathers and control parents. Trickett and Kuczynski (1986) looked at the daily reports of situations in which abusive and nonabusive mothers disciplined their children, and found no overall difference in the frequency of physical punishment. However, abusive mothers were more likely to use severe forms of punishment.

To summarize, abusive mothers were more likely to ignore their children's attempts at interaction. When they did interact with their children, the interactions contained more aversive and fewer prosocial behaviors compared to the interactions found in nonabusive families. Also, abusive mothers were more likely to rely upon severe forms of physical punishment as opposed to reasoning techniques when responding to their children's negative behaviors.

Depression and maternal reactions. A number of recent studies have demonstrated that the mother-child relationship differs as a function of maternal depression. Colletta (1983) reported that when mothers were depressed, they tended to be hostile, indifferent, and rejecting of their children. Field et al. (1985) found that depressed mothers expressed more punitive, controlling attitudes toward childrearing.

Observational studies have found that when interacting with their infants, depressed mothers were involved in less frequent imitative behavior and contingent responsivity, and showed flat or tense facial expressions (e.g., Bettles, 1988; Field et al., 1988; Field et al., 1985; Fleming, Ruble, Flett, & Shaul, 1988; Livingood, Daen, & Smith, 1983). Hops et al. (1987) observed nonverbal affective behaviors and found that depressed mothers emitted significantly higher rates of sadness and despondency and lower rates of pleasure and enthusiasm with family members. Longfellow, Zelkowitz, and Saunders (1982) found that maternal depression was associated with more verbal and physical punishment, and less nurturance and affection.

Studies have also observed how depressed mothers manage their children's behaviors. Kochanska, Kuczynski, Radke-Yarrow, and Welsh (1987) found that the more depressed a mother was, the less likely she was to achieve a compromise solution with her child. Using path analysis, Forehand et al. (1986) found a significant relationship between maternal depression and the use of vague or interrupted commands to which the child cannot comply (beta-commands). Rogers and Forehand (1983) and Webster-Stratton and Hammond (1988) found no statistically significant differences between depressed and nondepressed mothers. However, there was a strong trend for depressed mothers to exhibit more critical statements to their

children and to report more daily spankings.

Two studies to date have investigated the relationship between maternal depression and maternal reactions to their children's behaviors in an abusive population. Lahey et al. (1984) found that abusive mothers were significantly more depressed than nonabusive mothers. When interacting with their children, abusive mothers were more physically aversive (i.e., hitting, grabbing, pushing) than were nonabusive mothers. Also, Lahey et al. (1984) found that maternal depression was correlated with relatively less positive and more negative physical interactions between mothers and their children. Mash et al. (1983) also found that compared to control mothers, abusive mothers were more depressed and were more directive and controlling of their children in a task situation.

In summary, depressed mothers have been found to be less affectionate (e.g., Fleming et al., 1988), less responsive (e.g., Field et al., 1988), less affectively positive with family members (e.g., Hops et al., 1987), less adept at managing their children's behaviors (e.g., Kochanska et al., 1987), and more negative (e.g., Lahey et al., 1984). Also, given that abusive mothers were more depressed relative to nonabusive mothers (Evans, 1980; Lahey et al., 1984; Mash et al., 1983), it is important to determine what role depression plays in the abusive incident.

Empathy and maternal reactions. A number of studies have shown that empathic responding is negatively related to aggressive and antisocial behaviors (see review by Miller & Eisenberg, 1988). As well, empathy has been found to mediate prosocial behavior such as helping (e.g., Batson, Fultz, & Shoenrade, 1987; Coke, Batson, & McDavis, 1978). However, Batson et al. (1987) have differentiated between two types of emotional reactions that are often considered to be empathic: empathic concern and personal distress. Empathic concern involves feelings of sorrow and concern for another person's misfortunes whereas personal distress involves an aversive arousal within the person as a result of observing someone else in distress. A review by Eisenberg et al. (1988) provides support that empathic concern and personal distress are two different emotional responses and appear to motivate qualitatively different types of prosocial behavior. For example, feelings of empathic concern motivate a person to help reduce the distress of another person whereas feelings of personal distress motivate a person to reduce his or her own distress and will only motivate helping if it is the most effective means of reducing that person's own distress.

According to Feshbach (1987), low parental empathy may be one of the factors involved in physical child abuse. Feelings of empathic concern should inhibit abusive behavior by parents. On the other hand, parents with low

levels of empathic concern would be less likely to be upset by a maltreated child's distress and would be more likely to misunderstand the situation due to lower perspective-taking abilities. Several studies have investigated the role of parental empathy in parent-child relationships. For example, Wiesenfeld et al. (1984) investigated whether women who differed markedly in empathy, also differed in their responsiveness to infant affective stimuli. Women high in empathy felt more inclined to pick up a crying infant and felt it was important to respond to infants' expressions. Howes and Feshbach (cited in Feshbach, 1987) found that abusive parents were less empathic than nonabusive parents and showed less involvement, investment, and affect in interacting with their children during a task situation. Letourneau (1981) found that abusive mothers were less empathic than nonabusive mothers and withheld help and comfort for a significantly longer period when the child requested help or comfort. Also, abusive mothers responded more aggressively to a negative child behavior; 63.2% of abusive mothers versus 6.6% of nonabusive mothers gave a response that involved physically punishing or restricting the child. Disbrow et al. (1977) also found that compared to control mothers, physically abusive mothers were less empathic and were more likely to report using punishment and less likely to do nothing in response to their

children's negative behaviors. Newberger (1977) provides further support that abusive parenting behaviors are associated with lower perspective-taking abilities. Letourneau (1981) concluded that her results support the theory that parental empathy is positively related to nurturing and sensitive styles of parenting.

To summarize, parental empathy has been proposed to be an important factor in parent-child relationships and has been linked to parental behaviors of warmth, sensitivity, and involvement with the child. Also, low levels of parental empathy were found in abusive populations and were associated with aggressive parental behaviors.

#### Summary

A review of empirical data from abusive and nonabusive populations was undertaken in the areas of emotion recognition, attributions, and reactions, which are components of Lamb and Easterbrooks' (1981) model of sensitive caregiving. Findings were as follows: (1) abusive mothers were less accurate in recognizing infants' facial expressions (Kropp & Haynes, 1987), but were able to recognize facial expressions as well as nonabusive mothers under optimum conditions (e.g., Camras et al., 1988); (2) nonabusive mothers attributed children's positive behaviors to dispositional factors and negative behaviors to situational factors (e.g., Dix et al., 1986), whereas abusive mothers were more likely to attribute their



children's positive behaviors to situational factors and their children's negative behaviors to dispositional factors; and (3) when interacting with their children, abusive mothers were less sensitive, more interfering, and more negative compared to nonabusive mothers (e.g., see review by Wolfe, 1985).

The influence of depression and empathy on emotion recognition, attributions, and reactions was also reviewed. Depression was related to (1) less accurate emotion recognition abilities (e.g., Zuroff & Colussy, 1986); (2) negative maternal perceptions of children's behaviors (e.g., Webster-Stratton & Hammond, 1988); and (3) less affectionate and less responsive maternal reactions towards their children (e.g., Fleming et al., 1988). Empathic abilities were related to: (1) greater physiological differentiation in parents while viewing positive and negative child behaviors (e.g., Frodi & Lamb, 1980); (2) a greater tendency to attribute a person's failure to situational factors and a person's success to dispositional factors; and (3) more sensitive and nurturing styles of parenting (e.g., Letourneau, 1981).

#### The Present Study

The first purpose of the present study was to identify possible differences between a group of mothers who were at-risk for physically abusing their children (at-risk group) and a group of nonabusive mothers on emotion

recognition abilities, attributions, reactions to child behaviors, depression, and empathic abilities. It was hypothesized that: (1) at-risk mothers would not recognize emotional cues as well as control mothers; (2) relative to control mothers, at-risk mothers would be more likely to have a negative attributional bias (e.g, internal/intentional attributions for their infants' negative behaviors and external/unintentional attributions for their infants' positive behaviors); (3) at-risk mothers would report reacting to their infants' negative behaviors with more power assertive techniques and to their infants' positive behaviors with fewer nurturing reactions; (4) at-risk mothers would be more depressed; and (5) at-risk mothers would be less empathic compared to control mothers.

The second purpose of the present study was to examine the relationships among recognition of emotions, attributions, reactions, empathy, and depression for at-risk and control mothers. The hypothesized relationships among these six variables, as depicted in Figure 3 (see page 6), were based on the preceding review of the relevant literature. The six variables are represented in Figure 3 by the six theoretical (latent) constructs of emotion recognition, attributions, reactions, depression, empathy, and group membership (either at-risk or control group). The six theoretical constructs were classified as either endogenous or exogenous latent

constructs. If a construct was hypothesized to be directly caused or influenced by any of the other constructs, it was classified as endogenous (Hayduk, 1987); in Figure 3, depression, empathy, emotion recognition, attributions, and reactions were classified as endogenous latent constructs. If a construct was hypothesized to always act as a "cause" and never as an "effect", then it was classified as exogenous and fluctuations in the values of this construct were not explained by the model (Hayduk, 1987); in Figure 3, group membership was classified as the exogenous latent construct.

Linear structural relations analysis (LISREL; Joreskog & Sorbom, 1986; Version 6.6) was used to test the following relationships depicted in Figure 3. Group membership was hypothesized to influence levels of depression and empathy; specifically, at-risk mothers would be more depressed and less empathic compared to control mothers. The hypothesized relationships of high levels of depression and low levels of empathy with emotion recognition, attributions, and reactions are as follows: (1) less accurate emotion recognition abilities; (2) a negative attributional bias (e.g., external/unintentional attributions for child's positive behaviors and internal/intentional attributions for child's negative behaviors); and (3) more power assertive and fewer nurturing reactions. The hypothesized relationships among

emotion recognition, attributions, and reactions are as follows: (1) based on Lamb and Easterbrooks' (1981) hypothesized relationship between recognizing and interpreting the child's expression, it was hypothesized in the present study that higher accuracy of emotion recognition would be associated with a positive attributional bias (e.g., external/unintentional attributions for child's negative behaviors and internal/intentional attributions for child's positive behaviors); and (2) a positive attributional bias would be associated with more nurturing and fewer power assertive behaviors.

## Method

### Subjects

Subjects were 14 mothers who were considered to be at-risk for physically abusing their children (at-risk group) and 47 nonabusive mothers (control group). All of the at-risk mothers were participating in programs designed to assist families that were experiencing problems in parenting. Specifically, six at-risk mothers were recruited from the Holy Cross Hospital, five from the Early Childhood Services Day Treatment Program, two from the Alberta Children's Hospital, and one from Calgary Integrated Services. For the purpose of this study, physical abuse was defined as nonaccidental physical injury to a child by his or her caregiver (Kimball, Stewart, Conger, & Burgess, 1980).

Selection of each of the 14 at-risk mothers from the four participating treatment programs was based on the following criteria: (a) the mother had been physically abusive towards her child or was experiencing problems in parenting that placed her at-risk for physically abusing her child; (b) the mother did not have a serious, permanent physical/sensory or mental disability that could lead to atypical emotion recognition and/or reasoning about children's cues. (For example, a mother who was deaf may have been more skilled at recognizing nonverbal cues such as her child's facial expressions.); (c) the mother was not

exhibiting symptoms characteristic of a psychotic disorder. (Since the clinical delivery aspect of the programs did not permit a systematic diagnostic evaluation in the context of this research, the decision to exclude a potential subject on this ground was made by the assigned case worker.); and, (d) the mother was capable, according to her case worker, of participating in the study without disrupting her ongoing treatment.

Based on the at-risk mothers' case workers' reports, the average length of contact with the treatment agency was 15.36 months with a standard deviation of 7.69 months, and the majority of at-risk mothers had received some form of treatment which focused on their depression, sensitivity to their children's cues, show of concern for their children, and expectations of their children (see Table 1).

Of the 47 control mothers, 42 were recruited from 11 "Well-Child" community health clinics across the city of Calgary. These clinics were selected to provide a representative range of socioeconomic status. Appendix A contains descriptive information concerning the number of subjects recruited from each health clinic. Over a six week period, 53 mothers from the various health clinics completed a form indicating their interest in the study. When contacted by the researcher, 79% of the mothers were still interested in participating, 15% were no longer interested, and 6% were unreachable at the given telephone

Table 1

Frequency of Forms of Treatment Reported to Be Received  
by At-Risk Mothers as Rated by Their Case Workers

Treatment	Not at All	Moderate Amount	Extensive Amount
Sensitivity to Child's Emotional Cues	1	9	4
Mother's Depression	1	5	8
Show of Concern for Child	3	8	3
Alter Expectations and Attitudes Towards Child's Behavior	0	7	7

number. Five additional subjects were referred by mothers who had previously participated in the study. All mothers in the at-risk and control groups received 15 dollars for their participation.

The at-risk and control mothers were compared along a number of demographic characteristics. However, the t-ratios were not adjusted for the correlations among the eight demographic variables and consequently, the experimentwise error rate for the t-ratios may have been inflated. Therefore, to control the experimentwise alpha, the Dunn procedure (Dunn, 1961) was used. This procedure involves dividing the nominal alpha by the number of dependent measures and comparing each individual t-ratio to the critical-t for this adjusted alpha level. Using this procedure, the adjusted alpha was .006 (.05/8).

Using the adjusted alpha, no statistically significant group differences were found for mother's age, mother's occupation level, family size, or sex and age of youngest child (see Tables 2 and 3). The mean age of the at-risk mothers was 31.07 years (SD = 5.93) and the mean age of the control mothers was 29.96 years (SD = 6.18). Most mothers in this study had occupations involving a moderate amount of skill (mothers' occupation levels were determined using the Hollingshead Four Factor Index of Social Status). Both at-risk and control mothers had two children on average.



Table 2

Mothers' Age, Levels of Mothers' Education, Occupation, Socioeconomic Status, Family Size, and Age of Youngest Child

Variable	At-Risk		Control		$\underline{t}$ (df)
	Mean	SD	Mean	SD	
Mother's Age <sup>a</sup> (in years)	31.07	5.93	29.96	6.18	$\underline{t}(57) = -0.60$
Mother's Education <sup>b</sup> Level	3.00	1.41	4.81	0.95	$\underline{t}(59) = 5.56^{***}$
Mother's Occupation <sup>c</sup> Level	2.29	1.73	3.23	2.56	$\underline{t}(59) = 1.30$
Socioeconomic <sup>d</sup> Status	4.14	0.77	2.66	1.19	$\underline{t}(59) = -4.40^{***}$
Family Size	2.00	0.88	1.94	0.85	$\underline{t}(59) = -0.25$
Age of Youngest Child (in months)	53.36	25.52	28.04	35.50	$\underline{t}(59) = -2.48$

<sup>a</sup> Data for the ages of two of the subjects in the control group were missing.

<sup>b</sup> Values could range from 1 (less than seventh grade) to 7 (graduate degree from university).

<sup>c</sup> Values could range from 1 (menial service worker) to 9 (major professional).

<sup>d</sup> Values could range from 1 (major business owner or professional) to 5 (unskilled laborer).

\*\*\*  $p < .001$ .

Table 3

Mothers' Marital Status and Sex of Youngest Child

Variable	At-Risk	Control	Statistic
<u>Mother's Marital Status:</u>			
Married	5 (36) <sup>a</sup>	43 (91)	$\chi^2(1, \underline{N}=61)=16.82***$
Divorced/Single	9 (64)	4 (09)	
<u>Sex of Youngest Child:</u>			
Female	3 (21)	27 (57)	$\chi^2(1, \underline{N}=61)=4.25$
Male	11 (79)	20 (43)	

<sup>a</sup> Percentages are in parentheses.

\*\*\*  $p < .001$ .

At-risk mothers' youngest children tended to be on average two years older than control mothers' youngest children; however, this difference was not statistically significant. Also, at-risk mothers' youngest children were more likely to be male compared to control mothers' youngest children (79% versus 43%, respectively); once again, this difference was not statistically significant.

Statistically significant differences were found between the two groups of mothers on three of the demographic variables. Using the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975), at-risk mothers were found to be less educated,  $t(59) = 5.56$ ,  $p < .001$ , and were of lower socioeconomic status,  $t(59) = -4.40$ ,  $p < .001$ , when compared to control mothers. Specifically, the majority of at-risk mothers had completed tenth or eleventh grade compared to the majority of control mothers who had completed some college. At-risk mothers were more likely to be represented in social status category four (semiskilled worker) whereas control mothers were more likely to be represented in social status categories 2 and 3 (minor professional or skilled worker). Finally, at-risk mothers were less likely to be married,  $\chi^2(1, N = 61) = 16.82$ ,  $p < .001$ . Because of group differences on a number of these demographic characteristics, some were used as covariates in analyses to be described in the Results section.

### Stimulus Materials

Videotape of infants' emotions. The videotaped stimuli of infants' facial expressions used in this study were taken from a videotape that had previously been constructed by Izard, Dougherty, and Hembree (1983). As part of a longitudinal research project conducted in a public health clinic, Izard et al. (1983) had videotape-recorded eight male and sixteen female infants' responses to a variety of situations, ranging from playful mother-infant interactions to painful inoculations. Three of the infants were Black and the remaining 21 infants were Caucasian. The infants ranged in ages from 3 days to 13 months. There were approximately 550 examples of 9 emotions and blends of emotions represented in the original videotape.

In selecting a subsample of emotional expressions from the Izard et al. (1983) videotape for use in this study, several criteria were used: (a) the segments selected were of Caucasian infants since the group of mothers in the current study were more likely to have experience with Caucasian children; (b) in the segments, the sex of the infants was ambiguous to the observer in order to avoid possible gender biases; (c) in each segment, the contexts in which the infants were videotaped were ambiguous so as not to influence subjects' ratings; (d) segments depicting blends of emotions (i.e., interest and joy occurring

simultaneously) were excluded; (e) the infants' videotaped facial expressions were of good technical quality and were unobstructed by objects and/or people in the environment; (f) the duration of the facial expressions in each segment was sufficient to ensure recognition of the emotion; (g) if possible, segments depicting a female and male infant exhibiting the same facial expression were chosen; and, (h) if possible, the same infant was not represented in more than one segment in order to avoid child-specific biases.

Based on these eight selection criteria, the following 16 segments were initially chosen for possible inclusion in the study: 3 examples of joy, 4 examples of interest, 2 examples of surprise, 2 examples of pain, 3 examples of anger, and 2 examples of sadness. All sixteen videotaped segments were without colour or sound. The use of black and white stimuli without accompanying sound was consistent with emotion recognition tasks used in other studies (e.g., Camras et al., 1988; During, 1986).

In a pilot study, a videotape consisting of these 16 segments was shown to three undergraduate classes who completed an emotion rating checklist (see Appendix B). The purpose of this pilot study was to obtain information that would: (1) ensure that the final segments were neither too easy nor too difficult for subjects to recognize; and, (2) ensure that the positive and negative emotion segments had similar correct identification rates.

Of the 64 students participating in the pilot study, 37 were female and 24 were male (data concerning gender were missing for three of the subjects). Most students were in Year 3 of their programs ( $SD = 1.39$ ) and their mean age was 25.5 years ( $SD = 6.57$ ). Eleven of the 64 students were parents and had on average two children ( $SD = 1.17$ ).

Based on the identification rates of the 64 undergraduate students, twelve emotion segments were selected for inclusion in the study. The segments, along with the infants' sex and ages are presented in Table 4. Equal numbers of positive and negative emotions were chosen so that the task was equally fair to persons whose response bias was to see all affects as either positive or negative (Rosenthal, 1982). Correct identification of the segments was calculated as follows: subjects received a score of "1" each time they gave the target (correct) emotion the highest rating compared to the other emotions. For example, if the target emotion was joy and the subject gave joy a rating of 7 and the other five emotions a rating lower than 7, the subject received a score of "1". If a subject gave two emotions the highest rating, and one of those emotions was the target (correct) emotion, he/she received a score of "1". If the subject did not give the target emotion the highest rating, this was considered to be an error and the subject received a score of "0".

The first goal of the pilot study of ensuring that the

Table 4

Emotion Segments Selected Based on Pilot Study

Emotion	Sex of Infant	Age of Infant (days)	Percentage of Students Correctly Identifying Each Emotion	Length of Segments (seconds)
<u>Positive Emotions:</u>				
Interest1	female	060	70.3	4.9
Interest2	male	390	68.8	7.3
Joy1	female	128	82.8	2.9
Joy2	female	240	81.3	4.7
Surprise1	female	150	63.4	2.6
Surprise2 <sup>a</sup>	male	216	55.0	2.5
<u>Negative Emotions:</u>				
Anger1	female	391	40.6	2.8
Anger2	male	393	40.6	7.0
Pain1	male	060	70.3	4.5
Pain2	female	064	70.4	4.0
Sadness1	female	003	34.4	1.5
Sadness2	female	210	87.4	3.6

<sup>a</sup> After collecting data from 44 undergraduate students, the correct identification rate for Surprise2 was only 11%. The duration of the segment was then increased by two seconds in order to increase recognizability. Therefore, for this segment only, the identification rate is based on the responses of 20 students.

segments were neither too easy nor too difficult was not met. For example, the two segments of joy were quite easy for subjects to recognize accurately whereas the two examples of anger were quite difficult for subjects to recognize accurately. The second goal of the pilot study of ensuring that the positive and negative emotion segments had similar correct identification rates was difficult to meet given that the positive emotions were easier to recognize accurately; specifically, the overall percentage of correct identification rates for positive and negative emotions were 70.3% and 57.3%, respectively ( $t(63) = -2.25, p < .05$ ).

Based on the limited availability of appropriate videotaped segments, it was not possible for all six examples of emotions to have a female and a male infant exhibiting the same emotion; however, the emotional expressions of interest, surprise, anger, and pain were represented by both female and male infants. The average age in days of the infants was 197 for positive segments and 187 for negative segments,  $t(10) = 0.12, p = .90$ . No infant appeared in more than one segment. The average length of the segments for positive and negative emotions was 4.14 seconds and 3.9 seconds, respectively ( $t(10) = 0.23, p = .82$ ).

The order of presentation for the final 12 emotion segments was counter-balanced to produce four different



sequences. There were four criteria used to produce these four sequences. First, two sequences began with a positive emotion and two sequences began with a negative emotion. Second, the same emotion never appeared consecutively. Third, no more than two positive or two negative emotions appeared consecutively. Finally, for each pair of emotions (i.e., Sadness1 and Sadness2), each segment appeared first in two of the sequences. The order of emotion segments in each of the four sequences is presented in Appendix C.

Vignettes of positive and negative infant behaviors.

Vignettes of positive and negative infant behaviors were created for this study in order to maintain consistency between the ages of the children in the emotion recognition task (approximately 7 months) and the attributional task. The necessity of creating stories of infant behaviors was based on the fact that although stories involving child behaviors have been previously developed, these stories have typically focused on behaviors of children five years and older and were not applicable for infants.

As a guide for developing two positive and two negative vignettes of infant-related behaviors, the researcher identified child-related situations from previous research that have differentiated abusive and nonabusive mothers' reactions. Based on the Disbrow et al. (1977) study in which abusive and nonabusive parents were given the "Ways of Handling Irritating Child

Behaviors" checklist, two negative child behaviors that best differentiated abusive and nonabusive parents' reactions were selected: these were child yells, and child breaks something. Only one study which differentiated abusive and nonabusive parents' reactions for positive child behaviors was identified. Larrance and Twentyman (1983) found that abusive mothers were more likely to make external and unstable attributions when their children were successful at a puzzle or game. Therefore, a story was developed in which the infant successfully completed an age-appropriate puzzle-like task. The second positive vignette was based on a story developed by Dix et al. (1986) which was one of a few studies that assessed nonabusive parents' attributions for children's positive behaviors. The scenario developed by Dix et al. (1986) dealt with sharing behavior and this story was adapted to make it applicable for infants. Appendix D contains a complete description of the four stories developed for this study.

Each of the four stories was printed on a 5 x 8 index card. Four sequences of story presentation were developed in which two sequences started with a positive story and two sequences started with a negative story. Also, no story was in the same position across the four sequences (see Appendix E).

## Measures

Emotion rating checklist. After viewing each of the twelve individual segments of infants' expressions, mothers were asked to indicate the degree to which they felt each of the six emotions was present in the segment and how confident they felt about their ratings (see Appendix F). A dimensional format of responses was chosen because of the advantage of employing categories as dimensions (i.e., category ratings) compared to category ranking (i.e., ranking of subject's first three responses). With category ratings, the distance between any two adjacent ranks is forced to be the same for all subjects; with category ranking, the rated difference between first and second choice reflects each subject's assessment of the difference and will vary between subjects (Rosenthal, 1982). A 9-point Likert-type scale was chosen for added reliability (Nunnally, 1978).

Three measures were derived from the emotion rating scale: inaccuracy of emotion recognition, intensity of emotion recognition, and confidence ratings. For inaccuracy of emotion recognition, the subject's rating of the target (correct) emotion was subtracted from the highest rating for the emotion segment. It is important to note that when mothers rated each segment, they were instructed to choose one emotion and give that emotion the highest rating relative to all others; therefore, there

were no ties for the highest emotion rating. An example of a subject's inaccuracy score is as follows: if the target emotion was joy and the subject gave joy a rating of "1" and interest a rating of "9", her inaccuracy score would be 8 ( $9 - 1$ ). If the target emotion was joy and the subject gave joy the highest rating compared to the other five emotions (e.g., a score of 9), her inaccuracy score would be 0 ( $9 - 9$ ). For each of the 12 segments, subjects received a score ranging from "0" (least inaccuracy) to "8" (most inaccuracy). If a subject gave the highest rating to a negative emotion when the target emotion was a positive emotion, this was considered to be a serious error and the subject was given the highest inaccuracy score of 8; likewise, a subject received a score of 8 if she gave the highest rating to a positive emotion when the target emotion was negative (these two serious errors occurred only 2% of the time).

The second measure developed was intensity of emotion recognition. Twelve scores were generated by noting the rating of degree of presence (from 1 to 9) that the subject gave to each target (correct) emotion. A rating of 1 indicated that the subject did not perceive the target emotion to be present in the segment, and a rating of 9 indicated that the subject perceived the target emotion to be very present in the segment.

For the third measure, mothers received a score from

one to nine to indicate the degree of confidence concerning their ratings for each of the 12 segments: a score of "1" indicated that the mother was not confident that she knew what the "correct" emotion was, and a score of "9" indicated that the mother was very confident that she knew what the "correct" emotion was.

Attributional measures. Mothers' attributions for negative and positive infant behaviors were assessed by first using one open-ended question in which mothers were asked to specify what they felt was the most likely reason for their child's behavior (descriptive information concerning the percentages of responses to this question for at-risk and control mothers is found in Appendices G and H); this question was intended to function as a primer in that it forced mothers to think of causality which facilitated completion of the following two rating scales. The two 5-point Likert-type rating scales (see Appendix I) assessed (a) whether the child's behavior had something to do with the child's personality (internal attribution) or was due to the presence of something or someone in the child's environment causing the child's behavior (external attribution); and, (b) how intentional the child's behavior was. These questions were developed from the attributional measures used by Butler, Brewin, and Forsythe (1986), Dix et al. (1986), Holden (1985), Larrance and Twentyman (1983), and Rosenberg and Reppucci (1983). For each story,

subjects received a causality score ranging from 1 (internal) to 5 (external) and an intentionality score ranging from 1 (very intentional) to 5 (very unintentional).

Checklist of mothers' reactions to their infants' behaviors. Based on the checklist "Ways of Handling Irritating Child Behaviors", seven reactions that differentiated between abusive and nonabusive parents in previous research (Disbrow et al., 1977) were chosen. Two additional positive reactions, "praise or reward him/her" and "smile at him/her" were added to make the number of positive and negative reactions more balanced. The checklist developed for this study is shown in Appendix J. A 5-point Likert-type scale was used to indicate the likelihood of the mother choosing each of the nine reactions. A score of 1 (very unlikely to choose that response) to 5 (very likely to choose that response) was assigned to each of the reactions. Therefore, in total, there were eighteen maternal reactions to negative child behaviors and eighteen maternal reactions to positive child behaviors.

Center for Epidemiologic Studies Depression Scale (CES-D Scale; Radloff, 1977). The CES-D Scale is a 20-item self-report scale that assesses cognitive, affective, and behavioral depressive features within a one-week interval preceding its administration (see Appendix K). The CES-D

Scale was initially developed for use in epidemiologic surveys of depression within the general population. Scoring of the CES-D Scale involves summing the frequency scores (i.e., 0 to 3) across the 20 items of the scale to yield a single total which can range from 0 to 60. The frequency scores of items 4, 8, 12, and 16 are reversed before adding them to the total score. A total score of 16 has been suggested as the cutoff to indicate "case" depression (Radloff, 1977).

Radloff (1977) reported that the CES-D scale has satisfactory internal and test-retest reliabilities (internal reliability coefficients (Cronbach's coefficient alpha) ranged from .84 to .90; the correlations between test and retest scores ranged from .51 for a two-week interval to .59 for an eight-week interval). Convergent validity of the CES-D scale has also been demonstrated by Radloff. Devins and Orme (1985) provide an extensive review of the validity and reliability of the CES-D Scale.

Interpersonal Reactivity Index (IRI; Davis, 1980).

The IRI consists of four 7-item subscales that purportedly tap four unique aspects of the global concept of empathy (see Appendix L). The Perspective-Taking scale is cognitively oriented and measures a person's tendency to adopt the psychological point of view of others; for the purpose of the present study, the Perspective Taking scale will be referred to as Cognitive Empathy. The remaining

three subscales assess the emotional reactions of the respondents. The Empathic Concern scale assesses "other-oriented" feelings of sympathy and concern for unfortunate others; for the purpose of the present study, the Empathic Concern scale will be referred to as Affective Empathy. The Fantasy scale measures a person's tendency to transpose him/herself imaginatively into the feelings and actions of characters in movies and books. The final subscale, the Personal Distress scale, measures "self-oriented" feelings or personal anxiety and unease in tense interpersonal circumstances. Scoring of the IRI involves summing the response choices (i.e. 0 to 4) for each of the 4 subscales. The response choices (0 to 4) for items 3, 4, 7, 12, 13, 14, 15, 18, and 19 are reversed before adding them to the subscale scores.

Davis (1980) reported that that all four subscales of the IRI have satisfactory internal and test-retest reliabilities (internal reliability coefficients (Cronbach's standardized alpha) ranged from .70 to .78; the correlations between test and retest scores ranged from .61 to .81). Also, Davis (1983) by correlating the IRI with two other widely used empathy measures, provided evidence for the convergent validity of the IRI. Specifically, the cognitively-oriented Hogan Empathy Scale (Hogan, 1969) was most highly correlated with the Cognitive Empathy scale (mean  $r = .40$ ), while the Fantasy and Affective Empathy



scales were not correlated with the Hogan instrument (mean correlations of .15 and .18, respectively). The affectively-oriented Mehrabian and Epstein Emotional Empathy Scale (Mehrabian & Epstein, 1972) was highly correlated with the Fantasy and Affective Empathy scales (mean correlations of .52 and .60, respectively) compared to the Cognitive Empathy scale (mean  $r = .20$ )

Child Maltreatment Checklist (Giovannoni & Becerra, 1979). Since research has shown that there are differences between neglectful and abusive mothers (e.g., Crittenden, 1988; Wolfe, 1985), it was important to categorize the at-risk mothers into various forms of maltreatment. Therefore, after an at-risk mother had agreed to participate in the project, the case worker who was most familiar with her was asked to complete a modified version of a checklist of specific incidents and conditions of maltreatment developed by Giovannoni and Becerra (1979; see Appendix M). The checklist was modified by making the items less detail-specific in order to be applicable to more mothers. For example, the first item "The mother burned her child" was originally "The parent burned the child on the buttocks and chest with a cigarette". Also, the original checklist contained questions regarding the parent's sexual mores which were deleted for the purposes of this study.

For each of the 58 items, case workers were asked to

indicate if they knew or suspected the mother of engaging in that behavior. Scoring of the checklist was based on the procedures provided by Giovannoni and Becerra (1979). First, the checklist items were grouped into the following eight categories: physical abuse, sexual abuse, fostering delinquency, lack of supervision, emotional mistreatment, drug/alcohol abuse, failure-to-provide, and educational neglect. Next, a severity rating ranging from 1 to 9 was assigned to each endorsed item; a score of 1 indicated that the item was the least serious and a score of 9 indicated that the item was the most serious. These severity ratings were obtained by Giovannoni and Becerra (1979) from 313 professionals (i.e., lawyers, social workers, pediatricians, and police officers; see Appendix N). Thus, if the case worker had suspected or knew of the mother engaging in that behavior, the mother was assigned the severity rating corresponding to that item. Finally, a total severity rating for each of the eight categories was calculated by adding together the severity scores, dividing by the number of items per category, and then rounding off to the nearest whole number. The at-risk mothers in the present study were found to score highest in the category of physical abuse,  $M = 2.45$ ,  $SD = 1.65$ , (see Table 5). In fact, all but one mother had engaged in at least one physically abusive behavior; almost 50% of the at-risk mothers had engaged in three or more of the physically

Table 5

Severity of Abusiveness Scores for Eight Categories of  
Child Maltreatment Among At-Risk Mothers

Category <sup>a</sup>	Mean	SD	Range
Physical Abuse	2.45	1.65	0-5.50
Drug/Alcohol Abuse	1.18	1.63	0-6.22
Emotional Mistreatment	0.77	0.82	0-2.14
Lack of Supervision	0.69	1.22	0-4.43
Educational Neglect	0.46	0.82	0-2.25
Failure-to-Provide	0.40	0.77	0-2.88
Sexual Abuse	0.19	0.52	0-1.83
Delinquency	0.00	0.00	0
Total Severity of Abusiveness	0.77	0.71	0-2.97

<sup>a</sup> The means for each category based on the severity ratings obtained by Giovannoni and Becerra (1979) from 313 professionals are as follows: Physical Abuse 6.88, Drug/Alcohol Abuse 4.63, Emotional Mistreatment 5.04, Lack of Supervision 5.23, Educational Neglect 4.08, Failure-to-Provide 4.56, Sexual Abuse 6.63, Delinquency 6.54.

abusive behaviors listed in Appendix M.

Hollingshead Four Factor Index of Social Status

(Hollingshead, 1975). This index estimates the social status score of an individual or nuclear family unit by combining information concerning education and occupation levels. To generate a status score for an individual, the scale values for the individual's occupation and education levels were noted. The scale values for occupation range from 1 (menial service workers/ dependent upon welfare) to 9 (major professional/ proprietor of large business). The scale values for education range from 1 (less than seventh grade) to 7 (graduate degree from university). Next, the scale value for occupation was multiplied by a weight of five and the scale value for education was multiplied by a weight of three. Based on the aggregate of these two scores, an individual was assigned one of the following status scores: major business owner or a professional (social status = 1); medium business owner or a minor professional (social status = 2); skilled craftsmen, clerical or sales worker (social status = 3); machine operator or semiskilled worker (social status = 4); or, unskilled laborer or menial service worker (social status = 5). The calculation of status score for a family with both spouses working was based on the calculation of the status score for each spouse which were then added together and divided by two. If only one spouse was working, the status

score for the family was based solely on the working spouse.

### Procedure

The researcher met separately with the case workers from each of the four participating treatment programs, explained the project to them, and outlined the subject selection criteria. The at-risk mothers who were appropriate for the study were invited to participate by their assigned case worker. The case workers explained the nature of the study to the mothers following a standard format (see Appendix O), and if they were willing to participate their names and telephone numbers were given to the researcher by the case worker. Each case worker was asked the following: to complete the Child Maltreatment Checklist (Giovannoni & Becerra, 1979), to indicate the length of time the mother had been receiving treatment and the nature of the treatment, and to categorize the mother as being either physically abusive or at-risk for physical abuse.

Control mothers were recruited from eleven "Well-Child" community health clinics in the city of Calgary. At each community health clinic, a poster inviting mothers to participate in the project was posted (see Appendix P). Posters remained at each clinic for approximately 6 weeks. Mothers who wanted more information about the project were asked to approach the receptionist

for the letter describing the project (see Appendix Q). At the end of the letter, there was a space for mothers to provide their name and telephone number.

Given that at-risk mothers tended to have older children, a second recruitment procedure for control mothers with older children was necessary. All 42 control mothers who had participated in the study were contacted by telephone and asked to contact the researcher if any of their friends with children older than five years were interested in participating in the study (see Appendix R for a protocol of the telephone conversation). Although twenty-seven of the 42 control mothers indicated that they had friends with older children, this method of subject recruitment only yielded an additional five subjects who were interested in participating.

All 61 mothers were contacted by telephone to invite them to participate in the project and to arrange their meeting (see Appendix S for a protocol of the telephone conversation). Each mother was sent an envelope which contained the following: a reminder of the appointment, a parking permit or bus pass depending on how she was travelling, instructions on where to park, a map indicating where she would be met as soon as she parked or departed the bus and finally, a picture of the researcher to facilitate the mother finding her. On the day prior to testing, each mother was contacted to confirm her

appointment. If the arranged appointment was no longer convenient for the mother, another appointment was arranged.

All control mothers plus seven of the 14 at-risk mothers were tested at the Family Study Project laboratory at the University of Calgary. One at-risk mother was tested at the Alberta Children's Hospital and six at-risk mothers were tested at the Holy Cross Hospital. At-risk mothers from the Alberta Children's Hospital and Holy Cross Hospital had the option of meeting at the University of Calgary or at the hospital of her treatment. When the researcher first met with each of the mothers, a standard format was followed in which the details of the testing procedure were explained to the mother (see Appendix T); then, mothers were asked to sign a consent form (see Appendix U). Mothers were reassured that their names would not appear on any of the forms and that they would receive a written summary of the general results when the study had been completed. At-risk mothers from the Alberta Children's Hospital and Calgary Integrated Services were informed their program would have access to their results. At-risk mothers from the Holy Cross Hospital and Early Childhood Services Day Treatment Program had the option of allowing their treatment program access to their results, and all mothers gave their permission. The issue of agency's access to individual's results was left to each

agency's discretion.

The testing procedure began with mothers providing some demographic information (see Appendix V). Mothers were then seated approximately four feet in front of a 16 inch television set and were shown two practice segments of emotions not used in the study, fatigue and distress; the purpose of the two practice segments was to familiarize mothers with the rating procedure. The researcher ascertained that each mother was able to view the segments at the distance of four feet without difficulty. Once a segment had been shown twice, the tape was paused and a stop-frame portraying the peak expression for that emotion was presented. A stop-frame for each emotion was used in order to avoid the possible confound of attention and/or memory differences which might have occurred if the emotion had only been presented briefly to the mothers. Hence, by providing mothers with a stop-frame, any differences found would be a function of recognition abilities and not memory differences. While viewing the stop-frame, mothers were asked to rate the degree of presence of each of the six emotions on a 9-point scale and how confident they were concerning their rating. Also, mothers were asked to pick one of those six emotions and give it the highest rating; this was done to facilitate scoring of the data. Each mother was randomly assigned to one of the four sequences of emotions.



For the next task, mothers were asked to complete the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and the Interpersonal Reactivity Index (Davis, 1980). The researcher read out loud each item of these two questionnaires and the subjects circled their answers.

Next, mothers were instructed to imagine that the four short stories they were about to hear were about themselves and their child. If the mother's child was no longer an infant, she was asked to think back to when her child was around one year old. If the mother had two or more children and the children were older than one year, she was instructed to choose her youngest child and think back to when he/she was one year old. Before using the scales, mothers were read a practice story in order to ensure that they understood the task. For each story, mothers received an index card with the story printed on it. The researcher read each story out loud and after hearing each story, mothers' attributions for, and reactions to, the infant's behaviors were assessed using the attributional and reaction measures, respectively. Assignment to one of the four story sequences was done randomly. Throughout the session mothers were reassured repeatedly that this was not a test, that there were no right or wrong answers, and that the researcher was interested in learning how most mothers responded to the items.

Following the completion of the testing procedures,

mothers were asked if they had any questions or comments. After the mother's questions had been answered, she was thanked for her participation and was paid 15 dollars. The researcher then walked the mother back to her car or to the bus station. Each testing session lasted approximately 90 minutes.

## Results

### General Overview

The presentation of results that follows is organized into three sections. First, the psychometric evaluation of the dependent measures will be discussed along with the rationale for combining dependent measures. The second section will discuss differences between at-risk and control mothers on the dependent measures. Finally, the relationships among the dependent measures will be investigated.

### Deletion of Ambiguous Stimuli

Given that the twelve emotion segments and four vignettes of positive and negative infant behaviors were adapted for the present study, it was important to identify any interpretational difficulties that mothers may have had with the stimuli. Therefore, mothers' abilities to recognize the emotion segments and to respond to the four infant vignettes were examined prior to their use in further analyses. Appendices W, X, Y, Z, AA, and BB contain descriptive information regarding mothers' inaccuracy of emotion recognition, intensity of emotion recognition, confidence ratings, attributional ratings, reactions to negative behaviors, and reactions to positive behaviors, respectively.

Examination of mothers' abilities to correctly identify the twelve emotion segments revealed that mothers

had the most difficulty recognizing Surprise1, Surprise2, and Sadness1 (see Appendix W). The correct identification rates for control mothers were 25% for Surprise1, 19% for Surprise2, and 9% for Sadness1; the correct identification rates for at-risk mothers were 29% for Surprise1, 21% for Surprise2, and 7% for Sadness1. In light of these low identification rates, mothers' inaccuracy of emotion recognition scores, intensity of emotion recognition scores, and confidence ratings for Surprise1, Surprise2, and Sadness1 were removed from all further analyses.

The decision was made to remove mothers' attributional ratings and reactions from all further analyses for two of the vignettes. During the process of testing mothers, it became evident that for the vignette in which the infant broke the necklace, mothers were not rating the same infant behavior for the attributions of causality and intentionality. From mothers' responses to the open-ended question, it was evident that they were rating the infants' playing behavior for the attribution of causality (see Appendix G for examples). However, mothers were rating the infants' behavior as unintentional which lead the researcher to believe that mothers were rating the breaking of the necklace for the attribution of intentionality. Another problem with the broken necklace vignette was that there was little variation for the attribution of intentionality because virtually all mothers rated the

breaking of the necklace as accidental.

The second problematic vignette was the one in which the infant successfully completed a puzzle-like task on his/her first try. Several mothers commented that it was unrealistic to expect a twelve-month old child to successfully complete this type of game on the very first try. Also, responses to this vignette were not consistent with the responses to the other vignettes in that a range of good versus bad child attributions was not obtained (see Appendix G). Given the concerns voiced by the mothers and the restricted range of causal attributions, the decision was made to remove mothers' attributions and reactions for the puzzle vignette from all further analyses.

#### Composite Scoring of Dependent Measures

Composite scores for the dependent measures of emotion recognition, confidence ratings, and maternal reactions were created to reduce the data set and to obtain a meaningful combination of the dependent variables based on conceptual and statistical criteria. Cronbach's coefficient alpha (Cronbach, 1951) was used to estimate the internal consistency of each composite score. As well, the corrected item-total correlation for each variable was used to identify variables that were reducing the overall reliability of the composite scores. The corrected item-total correlation provides a measure of the item-criterion relationship (criterion equals the total

score minus the individual item score). Items which demonstrated a low relationship with the corrected total score and whose removal would result in a substantial increase in Cronbach's coefficient alpha, were removed from the composite score. The following sections will describe the composite scoring of the emotion recognition measures, confidence ratings, and maternal reactions; also, the difference scores of attributions of causality and intentionality will be described.

Inaccuracy of emotion recognition. The nine inaccuracy of emotion recognition scores were combined to form one composite measure of inaccuracy. The overall Cronbach's coefficient alpha for this composite score, the item-total correlation for each of the nine inaccuracy scores, and the alpha level if each inaccuracy score was removed are reported in Table 6. The item-total correlations ranged from  $-.03$  to  $.41$  and the reliability of the composite inaccuracy score was  $.35$ . On the basis of their low relationship with the total inaccuracy score and the increase in Cronbach's coefficient alpha if they were removed, it was decided to remove Interest2, Joy1, and Sadness2 from the total score. The internal consistency of the composite score was then recalculated. The new item-total correlations ranged from  $.18$  to  $.46$  and the overall coefficient alpha was  $.53$ . Thus, the composite inaccuracy score consisted of the inaccuracy scores for

Table 6

Internal Consistency for Inaccuracy of Emotion Recognition

Dependent Measures	Corrected Item-Total Correlation	Alpha If Item Deleted
<u>First Step:</u> (Overall Coefficient Alpha .35)		
Interest1	.12	.33
Interest2	.01	.42
Joy1	-.14	.39
Joy2	.11	.34
Anger1	.41	.14
Anger2	.08	.36
Pain1	.29	.24
Pain2	.35	.21
Sadness2	-.03	.38
<u>Final Step:*</u> (Overall Coefficient Alpha .53)		
Interest1	.21	.52
Joy2	.18	.53
Anger1	.46	.38
Anger2	.19	.54
Pain1	.44	.40
Pain2	.27	.49

\* With Interest2, Joy1, and Sadness2 removed.

Interest1, Joy2, Anger1, Anger2, Pain1, and Pain2. The composite score was divided by its number of items (six) and could range from 0 (least inaccuracy) to 8 (most inaccuracy). Although it would have been desirable to have two separate composite scores for positive and negative inaccuracy scores, the Cronbach's coefficient alpha for the positive inaccuracy composite score was only .03 (the Cronbach's coefficient alpha for the negative composite score was .52). Therefore, it was decided to create one global reliable inaccuracy score.

Intensity of emotion recognition. The nine intensity of emotion recognition scores were combined to form one composite intensity score. The item-total correlations ranged from .07 to .45 and the overall reliability of the composite score was .59 (see Table 7). Both Interest2 and Anger2 had a small correlation with the total score and Cronbach's coefficient alpha would increase if they were removed. Once these two variables were removed, the new item-total correlations ranged from .17 to .48 and Cronbach's coefficient alpha was .65. Thus, the composite intensity score was comprised of the intensity scores of Interest1, Joy1, Joy2, Anger1, Pain1, Pain2, and Sadness2. The composite score was divided by seven (number of intensity scores) and could range from 0 (emotions not at all present) to 9 (emotions very present). Two separate composite scores for intensity of positive and negative



Table 7

Internal Consistency for Intensity of Emotion Recognition

Dependent Measures	Corrected Item-Total Correlation	Alpha If Item Deleted
<u>First Step:</u> (Overall Coefficient Alpha .59)		
Interest1	.24	.57
Interest2	.07	.62
Joy1	.39	.53
Joy2	.34	.55
Anger1	.42	.51
Anger2	.11	.62
Pain1	.44	.51
Pain2	.45	.50
Sadness2	.19	.58
<u>Final Step:*</u> (Overall Coefficient Alpha .65)		
Interest1	.17	.66
Joy1	.42	.59
Joy2	.37	.61
Anger1	.43	.59
Pain1	.48	.57
Pain2	.44	.58
Sadness2	.25	.64

\* With Interest2 and Anger2 removed.

emotions were also created; the Cronbach's coefficient alpha was .52 for positive emotions and .63 for negative emotions. However, the decision was made to form one global intensity score to be consistent with the global inaccuracy score.

Confidence ratings. The nine confidence ratings were combined to form one composite confidence score. The item-total correlations ranged from .39 to .65 and the internal reliability of the composite score was .83 (see Table 8). Removal of any of the confidence scores would not improve the overall reliability of the composite confidence score. The composite score was divided by its number of variables (nine) and could range from 1 (not at all confident) to 9 (very confident).

Maternal reactions to infant behaviors. Composite scores for maternal reactions were created from the nine maternal reactions to the infant yelling at bedtime and the nine reactions to the infant sharing a treat. However, four reactions had to be removed from further analyses due to their zero or almost zero variance (see Appendices AA and BB): yelling, spanking, and removing the infant when the infant shared, and praising the yelling infant. From the remaining 14 maternal reactions, the following composite scores were created.

Intrusion. Maternal reactions of explaining why the child should not share and distracting the sharing child

Table 8

Internal Consistency for Confidence Ratings

Dependent Measures	Corrected Item- Total Correlation	Alpha If Item Deleted
Overall Coefficient Alpha .83		
Interest1	.63	.81
Interest2	.39	.83
Joy1	.47	.83
Joy2	.58	.81
Anger1	.49	.82
Anger2	.51	.82
Pain1	.64	.81
Pain2	.65	.80
Sadness2	.58	.82

were combined to form a composite score of intrusion. The Cronbach's coefficient alpha for the intrusion score was .73 (see Table 9). The composite score was divided by two (the number of items) and could range from 1 (very unlikely) to 5 (very likely).

Isolation. Based on a category of social or physical isolation developed by Grusec and Kuczynski (1980), maternal reactions of removing the yelling child, ignoring the yelling child, and ignoring the sharing child were all considered to be reactions that resulted in the child being socially or physically isolated from the mother. The item-total correlations ranged from .20 to .32 and the overall reliability of the composite isolation score was .45 (see Table 9). The composite score was divided by three (number of variables) and could range from 1 (very unlikely) to 5 (very likely).

Nurturance. The following maternal reactions were combined to form a composite score of nurturance: smile at yelling child, hug yelling child, distract yelling child, praise sharing child, smile at sharing child, and hug sharing child. Table 9 contains the item-total correlations and the overall reliability of the nurturance score. The item-correlations ranged from .16 to .31 and the Cronbach's coefficient alpha was .44. The nurturance score was divided by its number of variables (six) and could range from 1 (very unlikely) to 5 (very likely).

Table 9

Internal Consistency for Maternal Reactions

Dependent Measures		Corrected Item-Total Correlation	Alpha If Item Deleted	Overall Coefficient Alpha
<u>Intrusion:</u>				.73
Explain	(Shares) <sup>a</sup>	.62	-	
Distraction	(Shares)	.62	-	
<u>Isolation:</u>				.45
Do Nothing	(Yells)	.31	.29	
Remove Child	(Yells)	.32	.27	
Do Nothing	(Shares)	.20	.46	
<u>Nurturance:</u>				.44
Smile	(Yells)	.16	.42	
Hug	(Yells)	.22	.39	
Distraction	(Yells)	.28	.35	
Praise	(Shares)	.19	.40	
Smile	(Shares)	.31	.37	
Hug	(Shares)	.17	.42	
<u>Punishment:</u>				.40
Yell	(Yells)	.26	-	
Spank	(Yells)	.26	-	
<u>Reasoning:</u> <sup>b</sup>	(Yells)	-	-	-

<sup>a</sup> Categories refer to vignettes of infant behaviors.

<sup>b</sup> Coefficient alpha could not be computed because Reasoning had only one item.

Punishment. Based on a similar category of power assertion (e.g., Grusec & Kuczynski, 1980), maternal reactions of yelling and spanking a yelling child were combined to form a composite score of punishment. The overall reliability of this score was .40 (see Table 9), and when divided by two could range from 1 (very unlikely) to 5 (very likely).

Reasoning. Based on the category of reasoning used by Trickett and Kuczynski (1986), the maternal reaction of reasoning when the child yelled formed its own score.

Attributional ratings. Two difference scores were created for the attributions of causality and intentionality for the vignettes of child yelling and sharing. Difference scores were created instead of composite scores because low attributional ratings from the positive infant vignettes reflected a positive view of the child whereas low attributional ratings from the negative infant vignettes reflected a negative view of the child.

Before creating the difference scores, the values of both causality and intentionality ratings were reversed so that a high score would reflect a positive bias and a low score would reflect a negative bias. A score of 1 on the causality rating indicated that a mother attributed external causes for her infant's behavior and a score of 5 indicated that the mother attributed internal causes for her infant's behavior. A score of 1 on the intentionality

rating indicated that a mother perceived her infant's behavior to be accidental and a score of 5 indicated that the mother perceived her infant's behavior to be intentional.

To create the difference score for attribution of causality, a mother's causality rating for her infant's yelling behavior was subtracted from the causality rating for her infant's sharing behavior. This new attribution of causality score could range from -4 (negative attributional bias) to +4 (positive attributional bias). A score of -4 would indicate that the mother attributed her infant's sharing behavior to external causes (rating = 1) and her infant's yelling behavior to internal causes (rating = 5); therefore, her attribution of causality score would be -4 ( $1 - 5$ ) and this score would reflect the mother's tendency to view her infant negatively. An attribution of causality score of +4 would indicate that the mother viewed her infant positively because she attributed internal causes for her infant's sharing behavior (rating = 5) and external causes for her infant's yelling behavior (rating = 1).

To create the difference score for attribution of intentionality, a mother's intentionality rating for her infant's yelling behavior was subtracted from the intentionality rating for her infant's sharing behavior. This new attribution of intentionality score could range from -4 (negative bias) to +4 (positive bias). A score of

-4 would indicate that the mother perceived her infant's sharing behavior to be accidental (rating = 1) and her infant's yelling behavior to be intentional (rating = 5); therefore, her attribution of intentionality score would be -4 (1 - 5) and this score would reflect the mother's tendency to view her infant negatively. An attribution of intentionality score of +4 would indicate that the mother viewed her infant positively because she perceived her infant's sharing behavior to be intentional (rating = 5) and her infant's yelling behavior to be accidental (rating = 1).

#### Analyses of Group Differences

Strategy for analyzing group differences. Before analyzing group differences using multivariate analyses, the dependent measures were first grouped as follows based on their conceptual similarity: (1) the three composite scores of inaccuracy of emotion recognition, intensity of emotion recognition, and confidence ratings (see Appendix CC for descriptive information), (2) the two difference scores of attributions of causality and intentionality (see Appendix DD), (3) the five composite scores of maternal reactions of intrusion, isolation, nurturance, punishment, and reasoning (see Appendix DD), and (4) the four empathy subscales of the Interpersonal Reactivity Index (see Appendix EE). Given that at-risk and control mothers were not matched on demographic variables, statistical controls



for demographic differences were employed. Three demographic variables were chosen as covariates that have been demonstrated, both conceptually and statistically, to affect the parent-child relationship: mother's marital status, mother's education level, and socioeconomic status. The relationships between the dependent measures and the three covariates are shown in Appendices FF and GG.

Once the dependent measures were grouped into the four categories and the three covariates selected, four separate multivariate analyses of covariance (MANCOVA) were used with the effects of the three covariates partialled out. For all four MANCOVAs, the independent variable was group membership (at-risk or control). It was decided a priori that interpreting significant univariate F-ratios would only occur if the overall multivariate F-ratio was significant. Analysis of covariance (ANCOVA) was used to analyze group differences for the depression measure with the effects of the three covariates partialled out. Appendix EE contains descriptive information for the depression measure. The potential influence of the order of stimuli was also investigated. The following sections will describe the results of the four MANCOVAs, the one ANCOVA, and the effects of order of stimuli.

Measures from the Emotion Rating Checklist. With the use of Wilk's criterion, the covariates and group membership failed to reach statistical significance,

$F(9,129) = 0.68$ ,  $p > .05$  for the covariates, and  $F(3,53) = 1.44$ ,  $p > .05$  for group membership. Appendix HH contains the univariate F-ratios for the three covariates and group membership.

Attributional ratings. The multivariate test for the covariates failed to reach significance,  $F(6,110) = 0.96$ ,  $p > .05$ . The combined composite scores of causality and intentionality were significantly related to group membership, approximate  $F(2,55) = 3.12$ ,  $p < .05$ . Using the univariate F-ratios (see Table 10), group membership was significantly related to the attribution of causality score after adjustment for covariates, univariate  $F(1,56) = 5.87$ ,  $p < .05$ . Specifically, at-risk mothers were less likely to make positive attributions for their infants' behaviors (causality mean adjusted for covariates = -1.20) compared to control mothers (causality mean adjusted for covariates = 0.55).

Maternal reactions. With the use of Wilk's criterion, the combined dependent variables were significantly related to the combined covariates, approximate  $F(15,138) = 1.80$ ,  $p < .05$ , but were not significantly related to group membership,  $F(5,50) = 2.21$ ,  $p > .05$ . The univariate F-ratios for the covariates revealed that the covariates were significantly related to the maternal reaction of punishment,  $F(3,54) = 3.23$ ,  $p < .05$  (see Table 10). To investigate more specifically the power of the covariates

Table 10

MANCOVA for Attributional Ratings and Maternal Reactions

Effect	Dependent Variable	Univariate F	df
<u>Attributional Ratings:</u>			
Covariates	Causality	1.77	3,56
	Intentionality	0.54	3,56
Group	Causality	5.87*	1,56
	Intentionality	2.01	1,56
<u>Maternal Reactions:</u>			
Covariates	Intrusion	1.73	3,54
	Isolation	1.54	3,54
	Nurturance	1.23	3,54
	Punishment	3.23*	3,54
	Reasoning	0.02	3,54
Group	Intrusion	0.02	1,54
	Isolation	0.53	1,54
	Nurturance	2.44	1,54
	Punishment	6.66*	1,54
	Reasoning	0.66	1,54

\*  $p < .05$ .

to adjust the maternal reaction of punishment, a hierarchical multiple regression was run in which mother's education level was given the highest priority, mother's socioeconomic status second priority, and mother's marital status was entered in last. Mother's education was the only covariate to provide significant prediction of the maternal reaction of punishment, with  $\beta = -.43$ ,  $t(57) = -2.96$ ,  $p < .01$ . Two other regression analyses were run in which socioeconomic status and marital status were each entered first and for both analyses mother's education level was still the only significant covariate after the other two covariates had been entered.

Interpersonal Reactivity Index. The multivariate tests for the covariates and group membership failed to reach statistical significance,  $F(12,140) = 0.28$ ,  $p > .05$  for the covariates, and  $F(4,53) = 1.19$ ,  $p > .05$  for group membership. Appendix HH contains the univariate F-ratios for the three covariates and group membership.

Depression. The effects of the three covariates were significantly related to maternal depression,  $F(3,56) = 6.35$ ,  $p < .001$ . To investigate more specifically the power of the covariates to adjust maternal depression, a hierarchical multiple regression was run in which mother's education level was given the highest priority, mother's socioeconomic status second priority, and mother's marital status was entered in last. Socioeconomic status provided

significant prediction of depression, with  $\beta = .38$ ,  $t(57) = 2.48$ ,  $p < .05$ . Two other regression analyses were run in which socioeconomic status and marital status were each entered first and for both analyses socioeconomic status was still the significant covariate after the other two covariates had been entered.

Group membership was also significantly related to depression after adjustment for covariates,  $F(1,56) = 4.77$ ,  $p < .05$ ; at-risk mothers were significantly more depressed (mean adjusted for covariates = 20.03) compared to control mothers (mean adjusted for covariates = 11.93). Using a cutoff score of 16 to indicate "case" depression, only 23% ( $n = 11$ ) of the control mothers had a total depression score of 16 or higher (range = 1 - 35), whereas 64% ( $n = 9$ ) of the at-risk mothers had a total depression score of 16 or higher (range = 4 - 46).

Order of stimuli. No statistically significant differences were found for the three measures obtained from the Emotion Rating checklist across the four sequences of emotions (see Appendix II). Also, no statistically significant differences were found for the attributional ratings and maternal reactions across the four sequences of vignettes (see Appendix JJ).

#### Relationships Among Variables

The originally hypothesized relationships among the dependent measures are depicted in Figure 3 (see

Introduction section). However, due to the changes that were made in the conceptualization and scoring of the dependent measures, a new model was created (see Figure 4). The specific changes made to the dependent measures were as follows: (1) in Figure 3 empathy was an unitary construct, whereas in Figure 4 empathy was conceptualized as having both an affective and cognitive component; (2) in Figure 4, recognition of emotions was conceptualized as two separate constructs of inaccuracy and intensity; (3) in Figure 3, maternal attributions were conceptualized as a general concept, whereas in Figure 4 maternal attributions was conceptualized as two separate constructs of causality and intentionality; and (4) in Figure 3 maternal reaction was one unitary construct, whereas in Figure 4 maternal reaction was comprised of five latent constructs representing the five composite scores of maternal reactions. Also, in order to simplify the model, depression and empathy were hypothesized to influence only the latent constructs of emotion recognition.

In Figure 4, the twelve endogenous latent constructs were depression, affective empathy, cognitive empathy, inaccuracy of emotion recognition, intensity of emotion recognition, attribution of causality, attribution of intentionality, nurturance, punishment, isolation, intrusion, and reasoning. The exogenous latent construct was at-risk or control group membership. The specific

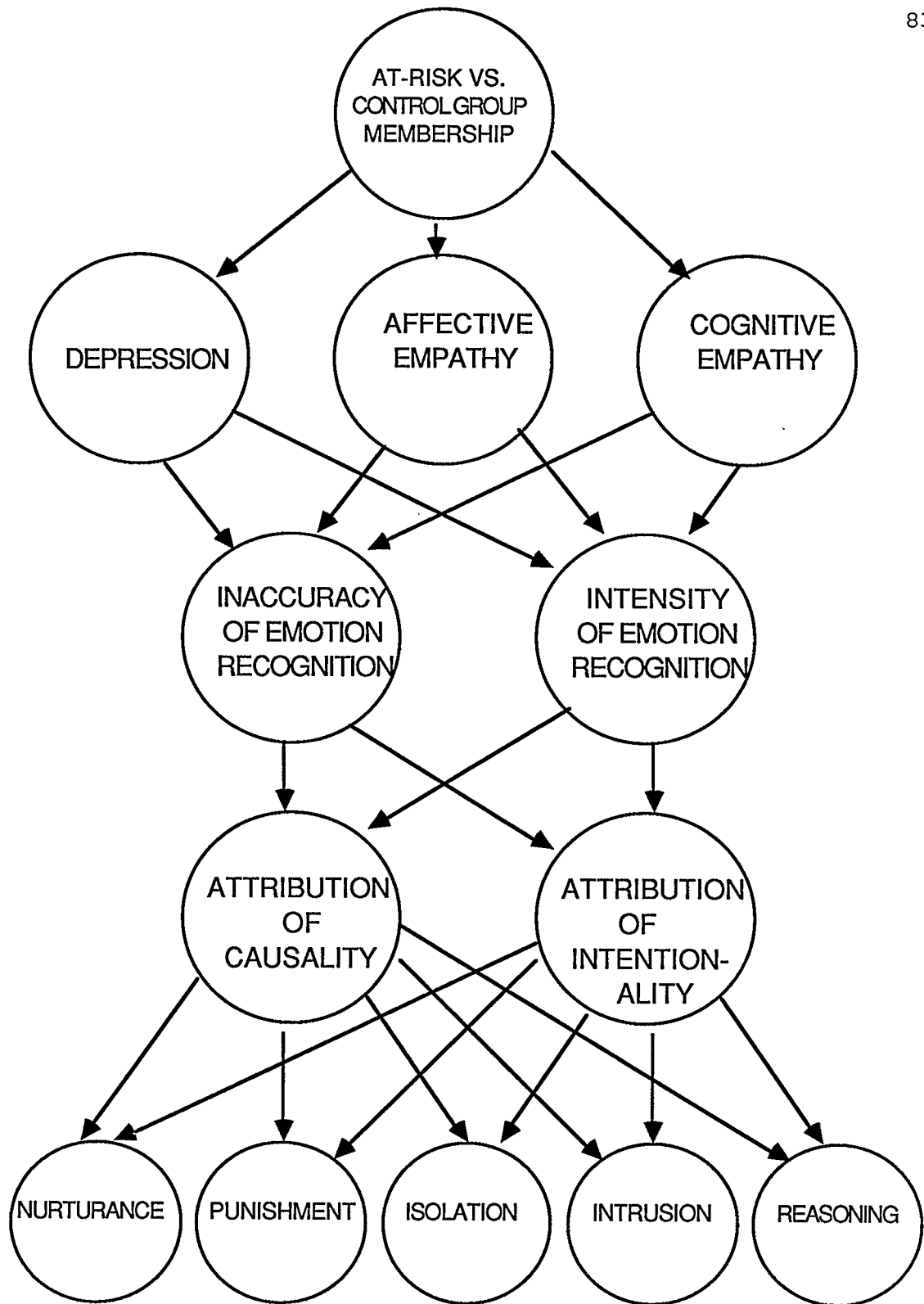


Figure 4. Model 1: Hypothesized relationships among latent constructs.

hypothesized relationships were as follows: (1) group membership was hypothesized to influence mothers' levels of depression, and affective and cognitive empathy; (2) depression, affective empathy, and cognitive empathy were hypothesized to influence mothers' inaccuracy and intensity of emotion recognition; (3) inaccuracy and intensity of emotion recognition were hypothesized to influence maternal attributions of causality and intentionality; and (4) maternal attributions of causality and intentionality were hypothesized to influence maternal reactions of nurturance, punishment, isolation, intrusion, and reasoning.

The LISREL program (Joreskog & Sorbom, 1986; Version 6.6) was used to test the path analytic model presented in Figure 4 and all subsequent models. The degree to which the proposed model is able to replicate the original patterns in the data can be determined by an examination of three measures: the overall chi-square statistic, the adjusted goodness of fit index, and the root mean square residual. A chi-square value which is large relative to its degrees of freedom is indicative of a poor fit, and a chi-square value which is small in comparison to its degrees of freedom suggests a good fit. The goodness of fit index, a measure of the variances and covariances accounted for by the model, is, unlike chi-square, independent of both sample size and departures from normality. The adjusted goodness of fit index is the



goodness of fit index adjusted for degrees of freedom. Both the adjusted goodness of fit index and the goodness of fit index should be between zero and one. The root mean square residual is an index of the average residual variances and covariances. The LISREL program also provides T-Values for each of the specified parameters; a T-Value (parameter estimate divided by its standard error) is used to determine the significance level of each parameter. The LISREL program also indicates where improvements could be made to an initially poor fitting model (e.g., modification indices).

Model 1. The correlation matrix of Model 1's components is presented in Table 11. The results of the first analysis indicated that the original model yielded a very poor fit to the data,  $\chi^2$  (68,  $N = 59$ ) = 121.25,  $p < .001$ . A significant chi-square is not desirable as it indicates that the differences between the model-implied relationships and the actual patterns in the data are not small enough to be sampling fluctuations. The adjusted goodness of fit index was .672 and the root mean square residual was .157.

According to Joreskog and Sorbom (1986), a more detailed assessment of fit can be obtained by an inspection of the modification indices. They recommend estimating parameters that have modification indices larger than five. However, they caution that only one new parameter at a time

Table 11

Pearson Product-Moment Correlation Matrix for Model 1 Components

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	1.0 <sup>a</sup>												
2.	.50	1.0											
3.	-.05	.07	1.0										
4.	-.06	-.19	.09	1.0									
5.	.14	.13	-.08	-.14	1.0								
6.	-.30	-.25	.23	.02	-.49	1.0							
7.	-.21	.09	.29	.23	-.07	.19	1.0						
8.	-.23	-.08	.22	.16	-.00	.12	.36	1.0					
9.	-.09	-.08	.33	-.02	-.10	.32	.09	.09	1.0				
10.	.41	.34	.04	-.08	.03	-.12	-.19	-.17	-.06	1.0			
11.	-.13	.14	.01	-.03	.01	.07	.14	-.09	-.22	-.02	1.0		
12.	.19	.18	-.20	-.25	.16	-.10	-.27	-.09	-.27	.13	.03	1.0	
13.	.14	.18	.04	.05	-.01	.04	-.06	.09	.01	.19	.13	.19	1.0

1. At-Risk vs. Control Group Membership

2. Depression

3. Affective Empathy

4. Cognitive Empathy

5. Inaccuracy of Emotion Recognition

6. Intensity of Emotion Recognition

7. Attribution of Causality

8. Attribution of Intentionality

9. Nurturance

10. Punishment

11. Isolation

12. Intrusion

13. Reasoning

a All correlations are based on 59 subjects.

be estimated since the modification indices can change drastically from one solution to the next. Therefore, in a series of steps, the following parameters (all with modification indices larger than five) were estimated: inaccuracy of emotion recognition to intensity of emotion recognition, attribution of causality to attribution of intentionality, depression to punishment, affective empathy to nurturance, intensity of emotion recognition to nurturance, and group membership to punishment.

The revisions to Model 1 yielded an acceptable fit to the data,  $\chi^2$  (61,  $N = 59$ ) = 55.36,  $p = .679$ . The corresponding adjusted goodness of fit index (.812) provided further support that the model adequately fit the data. In addition, the root mean square residual (.103) suggested relatively small residuals on average. In order to simplify the model, all parameters with T-Values less than 1.96 ( $p < .05$ ; standard cut-off value) were set to zero and the analysis was re-run. This yielded a good fit to the data with a chi-square of 68.28 with 81 degrees of freedom ( $p = .842$ ), an adjusted goodness of fit index of .833, and a root mean square residual of .118. The proportion of variance which was explained by the hypothesized relationships was 40%. Figure 5 illustrates only those parameters that were significant at  $p < .05$ . Results indicated that at-risk mothers were more likely to be depressed and to use punishment. The more depressed a

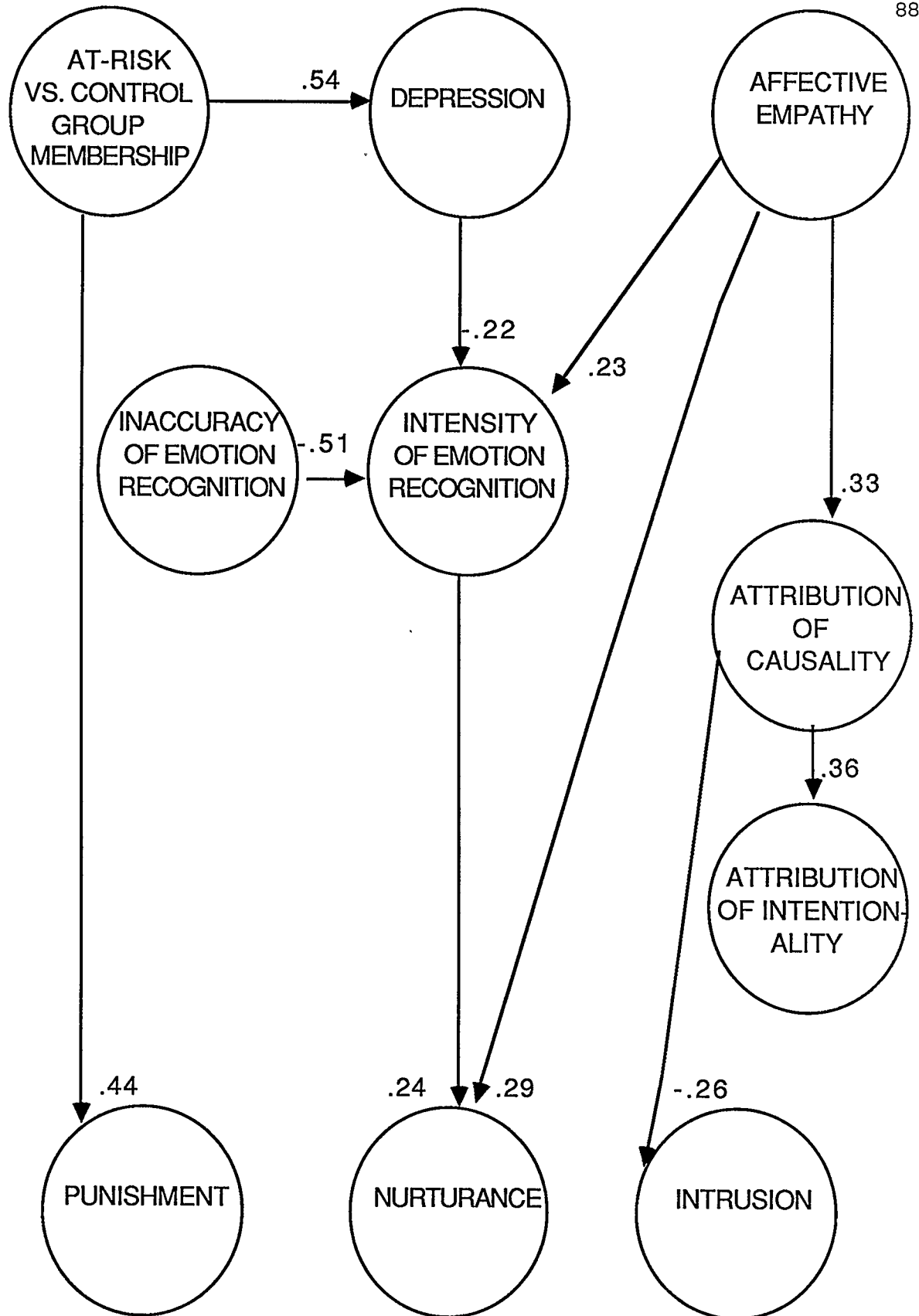


Figure 5. Model 1: Significant relationships among latent constructs at  $p < .05$ .

mother was, the lower her emotion intensity rating. Inaccuracy of emotion recognition and intensity of emotion recognition were negatively related which means that the more accurate a mother was (low inaccuracy score), the higher her intensity of emotion recognition rating. Also, the more affectively empathic a mother was, the higher her intensity of emotion recognition score. The findings were also consistent with the assertion that higher intensity of emotion recognition scores were associated with more self-reported nurturant reactions; also, the more affectively empathic a mother was, the more likely she was to use nurturance. Results also indicated that the more affectively empathic a mother was, the more likely she was to make positive causal attributions for her child's behavior. Mothers who were more likely to make positive causal attributions for their children's behavior were more likely to make positive intentionality attributions and were less likely to use intrusion.

Table 12 shows the total and indirect effects associated with each significant parameter. A total effect is the sum of the direct and indirect effects, and can best be interpreted as the change in one latent construct predicted to follow a unit change in another latent construct if all other variables are left untouched (Hayduk, 1987). Group membership had the most substantial direct effect on maternal depression. The relationship

Table 12

Total and Indirect Effects for Model 1

<u>Parameter</u>	<u>Total Effect</u>	<u>Indirect Effect Of:</u>
Group Membership to Depression	.50	None
Inaccuracy of Emotion Recognition to Intensity of Emotion Recognition	-.45	None
Group Membership to Punishment	.41	None
Attribution of Causality to Attribution of Intentionality	.36	Affective Empathy .11
Affective Empathy to Nurturance	.32	None
Affective Empathy to Attribution of Causality	.29	None
Attribution of Causality to Intrusion	-.27	Affective Empathy -.08
Intensity of Emotion Recognition to Nurturance	.25	Group Membership -.03 Depression -.05 Inaccuracy -.12 Affective Empathy .05
Depression to Intensity of Emotion Recognition	-.21	Group Membership -.10
Affective Empathy to Intensity of Emotion Recognition	.21	None

between intensity of emotion recognition and nurturance had the most indirect effects; specifically, the findings were consistent with the assertion that group membership, depression, inaccuracy, and affective empathy indirectly influenced maternal nurturance through the latent construct of intensity of emotion recognition.

Model 2. From the previous MANCOVAs and ANCOVA, it was found that the covariates were significantly related to the dependent measures of punishment and depression. Specifically, mother's education level was significantly related to punishment and socioeconomic status was significantly related to depression. However, when group membership was entered last into the hierarchical multiple regression with the three covariates for punishment, mother's education level was no longer significant for punishment and group membership was,  $\beta = -.42$ ,  $t(57) = -2.65$ ,  $p < .01$ . When group membership was entered last into the hierarchical multiple regression with the three covariates for depression, socioeconomic status and group membership were both significant,  $\beta = .36$ ,  $t(57) = 2.39$ ,  $p < .05$  for socioeconomic status, and  $\beta = -.34$ ,  $t(57) = -2.18$ ,  $p < .05$  for group membership. Thus, it appears that the socioeconomic status and group membership measures were more independent of each other compared to the measures of mother's education level and group membership. Given the high correlational relationship mother's education level

has with group membership and punishment, it was decided to investigate the effect that mother's education level may have on the significant parameters found in Model 1.

Therefore, a second model was generated (see Figure 6) in which mother's education level was the exogenous variable influencing group membership. The correlation matrix of Model 2's components is presented in Table 13.

The results of the first analysis indicated that the original model yielded a poor fit to the data,  $\chi^2$  (94,  $N$  = 59) = 98.72,  $p$  = .349. The adjusted goodness of fit index was .791 and the root mean square residual was .129. In order to improve the fit of Model 2, the following parameters with modification indices larger than five were estimated: mother's education level to punishment, and mother's education level to intrusion.

The revisions to Model 2 yielded an acceptable fit to the data,  $\chi^2$  (92,  $N$  = 59) = 71.98,  $p$  = .939. The corresponding adjusted goodness of fit index (.836) provided further support that the model fit the data well. In addition, the root mean square residual (.107) suggested relatively small residuals on average. In order to simplify the model, all parameters with T-Values less than 1.96 ( $p$  < .05; standard cut-off value) were set to zero and the analysis was re-run. This yielded a good fit to the data with a chi-square of 78.32 with 94 degrees of freedom ( $p$  = .878), an adjusted goodness of fit index of .833, and



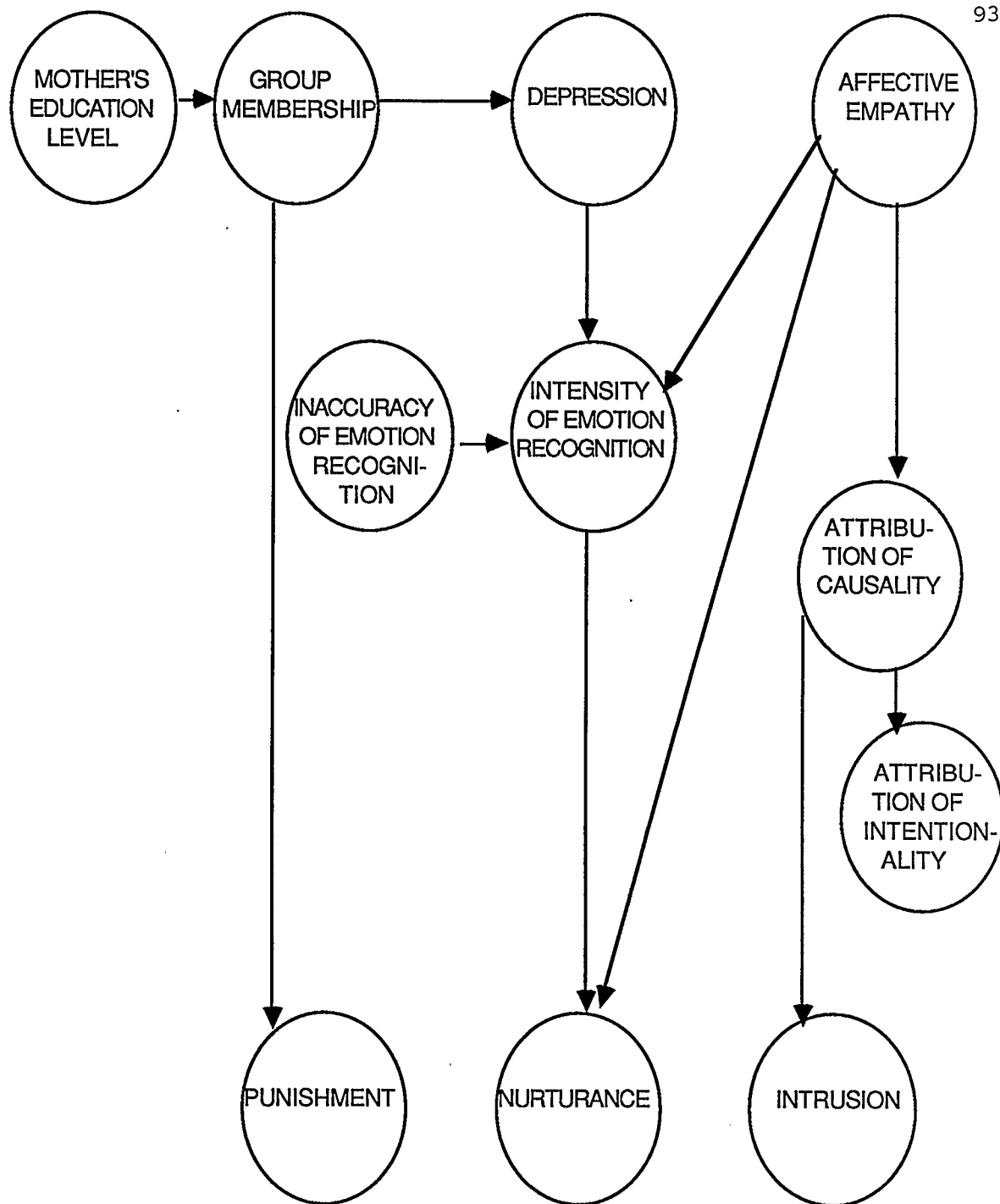


Figure 6. Model 2: Hypothesized relationships among latent constructs.

Table 13

Pearson Product-Moment Correlation Matrix for Model 2 Components

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	1.0 <sup>a</sup>													
2.	.50	1.0												
3.	-.05	.07	1.0											
4.	-.06	-.19	.09	1.0										
5.	.14	.13	-.08	-.14	1.0									
6.	-.30	-.25	.23	.02	-.49	1.0								
7.	-.21	.09	.29	.23	-.07	.19	1.0							
8.	-.23	-.08	.22	.16	-.00	.12	.36	1.0						
9.	-.09	-.08	.33	-.02	-.10	.32	.09	.09	1.0					
10.	.41	.34	.04	-.08	.03	-.12	-.19	-.17	-.06	1.0				
11.	-.13	.14	.01	-.03	.01	.07	.14	-.09	-.22	-.02	1.0			
12.	.19	.18	-.20	-.25	.16	-.10	-.27	-.09	-.27	.13	.03	1.0		
13.	.14	.18	.04	.05	-.01	.04	-.06	.09	.01	.19	.13	.19	1.0	
14.	-.59	-.36	-.17	.16	-.14	.23	.08	.12	.00	-.42	.18	-.33	-.06	1.0

1. At-Risk vs. Control Group Membership

2. Depression

3. Affective Empathy

4. Cognitive Empathy

5. Inaccuracy of Emotion Recognition

6. Intensity of Emotion Recognition

7. Attribution of Causality

8. Attribution of Intentionality

9. Nurturance

10. Punishment

11. Isolation

12. Intrusion

13. Reasoning

14. Mother's Education Level

a All correlations are based on 59 subjects.

a root mean square residual of .113. The proportion of variance which was explained by the hypothesized relationships was 50%. Figure 7 illustrates only those parameters that were significant at  $p < .05$ . Results indicated that at-risk mothers were more likely to be depressed and had lower intensity of emotion recognition ratings. Also, greater accuracy (low inaccuracy scores) was related to higher intensity scores. Mothers with higher emotion intensity ratings were more likely to use nurturance. The findings were consistent with the assertion that the more educated a mother was, the less likely she was to be at-risk for physical abuse, the less likely she was to use punishment, and the less likely she was to use intrusion. The more affectively empathic a mother was, the more likely she was to use nurturance and the more likely she was to make positive causal attributions for her child's behavior. Mothers who were more likely to make positive causal attributions for their children's behavior were more likely to make positive intentionality attributions and were less likely to use intrusion. Therefore, the addition of mother's education level resulted in the following: the addition of 10% explained variance among the latent constructs, the removal of the direct effect of group membership to punishment, and the removal of depression and affective empathy to directly influence intensity of emotion.

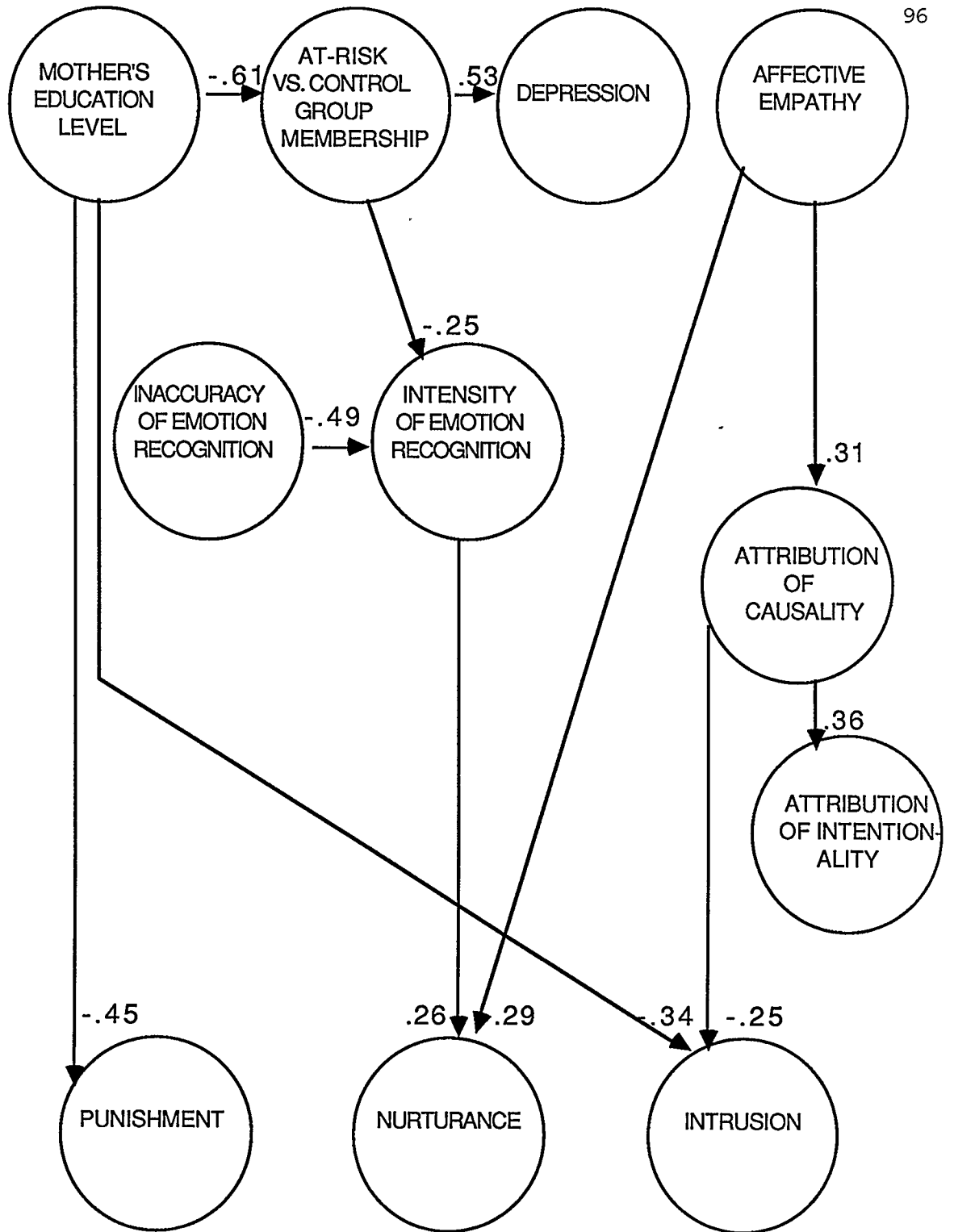


Figure 7. Model 2: Significant relationships among latent constructs at  $p < .05$ .

Table 14 shows the total and indirect effects associated with each significant parameter. Mother's education level had the most substantial direct effect on group membership. The relationship between intensity of emotion recognition and nurturance had the most indirect effects; specifically, the findings were consistent with the assertion that group membership, inaccuracy, and mother's education level indirectly influenced maternal nurturance through the latent construct of intensity of emotion recognition.

Table 14

Total and Indirect Effects for Model 2

<u>Parameter</u>	<u>Total Effect</u>	<u>Indirect Effect Of</u>
Mother's Education to Group Membership	-.60	None
Group Membership to Depression	.50	Mother's Education -.30
Inaccuracy of Emotion Recognition to Intensity of Emotion Recognition	-.46	None
Mother's Education to Punishment	-.42	None
Attribution of Causality to Attribution of Intentionality	.36	Affective Empathy .11
Mother's Education to Intrusion	-.31	None
Affective Empathy to Attribution of Causality	.29	None
Affective Empathy to Nurturance	.27	None
Intensity of Emotion Recognition to Nurturance	.25	Group Membership -.06 Inaccuracy -.12 Mother's Education .04
Group Membership to Intensity of Emotion Recognition	-.24	Mother's Education .14
Attribution of Causality to Intrusion	-.24	Affective Empathy -.07

## Discussion

The first goal of the present study was to identify possible differences between at-risk and control mothers on a number of affective, cognitive, and behavioral measures. One of the major findings of this study was a consistent lack of differences between groups. At-risk and control mothers did not differ significantly in their emotion recognition abilities, attributions concerning the intentionality of their children's behaviors, self-reported reactions to hypothetical child behaviors, or empathic abilities. In fact, there were only two significant group differences. First, at-risk mothers were considerably more depressed than nonabusive mothers. Second, at-risk mothers were somewhat more likely to have a negative attributional bias for the causes of their children's behaviors. There are several possible reasons for the failure to find predicted differences between at-risk and control mothers in the present study. Sample limitations, the use of insensitive measures, and the experimental conditions under which the constructs of interest were assessed all may have served to minimize group differences. Each of these three possibilities will be discussed in the following sections.

### Sample Limitations

With respect to sample limitations, selection procedures may have resulted in an unrepresentative group of at-risk mothers who were less severely impaired in their

capacity to effectively parent than has typically been found in abusive populations. There are two facets of the selection procedures that may have led to the recruitment of this unrepresentative sample of at-risk mothers. First, case workers were explicitly asked to choose mothers who they felt were capable of participating in the study without disrupting their ongoing program of treatment. In all likelihood, clients who were highly stressed were not referred, because their case workers would have been uncertain about the effects of their participation in this study. Although case workers' reasons for failing to refer potential subjects to this study were not assessed, another research project (MacInnis, 1984) found that the most common reason for excluding potential subjects was that mothers were too highly stressed. Therefore, it may be safe to assume that the selection criteria used in this study led to a group of at-risk mothers who were experiencing less stress than has typically been reported in other studies.

A second factor that may have contributed to the selection of a higher functioning group of at-risk mothers was the length and nature of the treatment received by these mothers. The average length of contact with the treatment agency for this sample was 15 months and the majority of at-risk mothers had received some form of treatment which focused on improving interactions with



their children. Specifically, at-risk mothers were taught to be more sensitive to their children's cues, to show more concern for their children, and to alter their expectations for their children. Given the length of time in treatment, improvement in some of these areas of parent functioning seems likely.

To summarize, the referral process resulted in a sample of at-risk mothers who were less stressed, and likely functioning at a level higher than abusive groups studied in prior research. Also, the focus of their treatment centered around constructs similar to those that were assessed in the present study such as improving their emotion recognition abilities. One potential consequence of this less severe group of at-risk mothers being in treatment for some time was a reduced likelihood of finding significant group differences on the constructs of interest.

#### Measurement Limitations

A second possible contribution to the lack of significant findings may have been that the measures used in this study were not sensitive indicators of the constructs of emotion recognition abilities, attributions, reactions, and empathic abilities. Such a lack of sensitivity may have resulted from a number of different sources. The relevant issues for each of the constructs of interest will be discussed in the following sections.

Emotion recognition. The segments of infants' facial expressions developed for use in this research project may have been too easy for mothers to recognize. With the exception of three segments for which mothers' responses were unreliable (two examples of surprise and one example of sadness), mothers had little difficulty correctly identifying the remaining nine segments of infants' facial expressions. For example, on a scale of 0 (least inaccuracy) to 8 (most inaccuracy), the mean inaccuracy score for the segments of interest and joy for control mothers was 0.56 and for at-risk mothers was 1.00. For the examples of anger, pain, and sadness, the mean inaccuracy scores for control and at-risk mothers were 1.41 and 1.79, respectively.

One possible reason for the relative ease mothers had in recognizing the emotion segments was that the segments represented examples of fundamental emotions. According to Izard et al. (1983), eight examples of fundamental emotions in infants are interest, joy, surprise, sadness, anger, disgust, fear, and pain. These types of emotions have been shown to be easily recognized even by subjects with little direct experience interacting with infants (Izard et al., 1980).

One potential consequence of the use of fundamental emotions in the present study is that the stimuli may not have been complex enough to capture group differences in

emotion recognition abilities. However, Kropp and Haynes (1987) found emotion recognition deficits in abusive mothers using similar examples of these basic types of emotions. One explanation for the discrepancy of findings is that the presentation of the facial expressions was different for the Kropp and Haynes (1987) study compared to the present study. In Kropp and Haynes' study, infants' facial expressions were presented at various angles compared to the present study which used frontal views only; it is likely that frontal views of expressions would be easier to recognize because all areas in the face would be unobscured. Also, Kropp and Haynes presented each slide for 30 seconds, whereas in the present study, each video segment was depicted twice followed by a freeze frame; it may have been easier for mothers to recognize emotions in the present study because they could observe several instances of each emotion in the videotaped segments.

To summarize, predicted differences in emotion recognition abilities between at-risk and control mothers may have been minimized in the present study due to the use of stimuli of fundamental emotions which were of good technical quality. In order to better evaluate the potential difficulties at-risk mothers may have in recognizing their children's emotional states, future research might employ tasks which include more complex types of emotions that require more skill. For example,

the inclusion of the more subtle and varied types of emotions that children often show during the course of social interactions, such as socialized emotions (e.g., embarrassment) and blends of emotions (e.g., interest and joy occurring simultaneously), may reveal emotion recognition deficits in at-risk mothers.

Attributions. Two types of attributions for children's positive and negative behaviors were assessed in the present study: attribution of causality and attribution of intentionality. A significant difference was found for attribution of causality; at-risk mothers were more likely to have a negative bias for the causes of their children's behaviors. However, the magnitude of this difference in attributional ratings was not that large; both groups of mothers were more likely to attribute their children's positive and negative behaviors to a combination of internal and external factors. No significant group difference was found for attribution of intentionality; both groups of mothers tended to perceive their children's positive and negative behaviors as somewhat intentional.

There was one feature of the attributional measures that were developed for this study that may have been responsible for the failure to find large differences between between the at-risk and nonabusive mothers. This feature was that quantitative rather than qualitative ratings were used. Following the format employed in

several other studies, mothers' attributions for the causes of their children's behaviors and the intentionality of those behaviors were assessed using rating scales. The rating scales ranged from 1 (internal causes/intentional) to 5 (external causes/unintentional). However, one difficulty with using such quantitative attribution ratings was that it may have obscured or masked qualitative differences between the two groups of mothers. For example, a causal attribution rating of 1 (child's behavior was internally caused) for the vignette in which a child yelled at bedtime could represent two qualitatively different attributions: one that the child was spoiled or another that the child was ill; however, this difference in conceptualizations would not be reflected in the ratings.

In support of the possibility that quantitative ratings may not have been sensitive to differences between at-risk and control mothers' attributions, group differences were most apparent when examining mothers' responses to the open-ended attribution of causality questions. For the vignette in which the infant yelled at bedtime, 78% of the at-risk mothers stated that their infants yelled because they did not want to go to bed or because they were spoiled, compared to 19% of the control mothers (see Appendix G). For the vignette in which the infant shared a treat, at-risk mothers were more likely to attribute the sharing behavior to external causes such as,

"the child was taught to share," and "the child wanted the older sibling's approval"; control mothers were more likely to attribute the sharing behavior to internal causes such as, "the child was loving, generous, and kind" (see Appendix H).

From examining mothers' responses to the open-ended questions, it was apparent that at-risk mothers viewed their children's behaviors more negatively compared to nonabusive mothers. However, these differences were not evident when examining the quantitative attributional ratings. Future work should be cognizant of the potential masking effect that quantitative ratings may have and attempt to develop ways in which to capture mothers' qualitatively different conceptualizations. One solution would be to present mothers with situations involving positive and negative child behaviors and ask mothers to explain the reasons for those behaviors. Mothers' verbatim dialogues as to the causes of their children's behaviors would then be categorized by experienced raters into more discrete categories such as negative-internal-stable (e.g., child is spoiled) and negative-internal-unstable (e.g., child is ill).

#### Maternal reactions to hypothetical vignettes.

Maternal reactions were assessed in this study by having mothers respond to hypothetical vignettes concerning their infants' behaviors in both positive and negative

situations. Mothers indicated the likelihood that they would use each of the response choices using a rating scale which ranged from 1 (very unlikely) to 5 (very likely). No significant group differences were found on any of the five reactions to infants' behaviors. Both groups of mothers were more likely to report using nurturance and reasoning; intrusion was the least likely choice for both at-risk and control mothers (see Appendix DD).

There are two possible reasons as to why the strategy of using self-reported reactions to infant vignettes may have decreased the likelihood of at-risk mothers responding with the predicted reactions of more punitiveness, and less nurturance. First, the use of hypothetical examples of infant behaviors may be a less sensitive assessment of maternal reactions to child behaviors because the behaviors in the vignettes may be less salient and arousing than actual child behaviors. The majority of studies which have found group differences have used direct observation of mothers interacting with their children (e.g., Crittenden, 1988; Mash et al., 1983). One reported alternative to direct observation was developed by Larrance and Twentyman (1983). This alternative increased experimenter control by enabling the child behaviors to be standardized across subjects, yet still retain the immediacy and reality of the children's behaviors. Larrance and Twentyman (1983) took photographs of each mother's own child performing a variety

of behaviors such as playing with a puzzle and playing with crayons. Snapshots were also taken of the potential outcomes of the children's behaviors such as a completed puzzle and a wall with crayon markings. Even though the children had not actually finished the puzzle or marked the walls, the photographs were sequenced so that it appeared as if the children had performed those behaviors. The addition of a visual representation of their children's behaviors may increase the saliency of those behaviors and may cause more arousal for mothers, compared to a verbal description of the same behaviors.

A second possible explanation for the failure to find significant group differences was that the task involved self-reported reactions. One problem associated with the use of self-report measures is the tendency for subjects to report socially desired responses. Social desirability of responses may be of particular concern for the at-risk mothers in this research project since they were informed prior to their participation that their treatment agency would have access to their results. One potential demand characteristic of these treatment agencies could be the strong expectation that treatment or intervention has been successful; this is especially so since mothers had contact with their programs for an average time period of 15 months. In light of this implicit expectation for treatment success, at-risk mothers may have been less



likely to report using undesirable parenting styles such as spanking and yelling based on the knowledge that their responses would be reported to their case workers.

To summarize, two features of the manner in which maternal reactions were assessed may have served to minimize differences between the two groups of mothers. First, presenting infant behaviors in hypothetical vignettes may have been potentially less relevant and arousing for the at-risk mothers. Second, the demand for socially desirable responses may have resulted in verbal reports of reactions that do not correspond to how mothers actually respond to their children outside of an experimental context.

Empathy. Maternal empathic abilities were assessed in this research project using the Interpersonal Reactivity Index (Davis, 1980). No significant group differences were found on the scales of affective empathy, cognitive empathy, personal distress, and fantasy. Also, at-risk and control mothers' scores on all four scales were well within the norms provided by Davis (1980). Davis (1980) reported that the mean scores on the four subscales for 206 females in an introductory psychology class were as follows: Affective Empathy = 22; Cognitive Empathy = 18; Fantasy = 19; and Personal Distress = 12. The mean scores for the combined sample of at-risk and control mothers in the present study were as follows: Affective Empathy = 23;

Cognitive Empathy = 18; Fantasy = 18; and Personal Distress = 10 (individual means for at-risk and control mothers are reported in Appendix EE).

The findings that at-risk mothers had similar levels of empathy compared to control mothers were not expected, in light of the fact that several studies have reported that physically abusive mothers were less empathic compared to nonabusive mothers (e.g., Feshbach & Caskey, 1986; Newberger, 1977). One possible reason for the failure to find such a difference here was that the type of empathy being assessed was different than in other studies. The Interpersonal Reactivity Index (Davis, 1980) assessed the general construct of empathy towards others. On the other hand, several studies which have found differences between abusive and nonabusive parents' empathic abilities, used empathy measures consisting of more child-related items. For example, Feshbach and Caskey (1986) used their Parent/Partner Empathy Scale and Newberger (1977) used her measure of parental awareness to find that abusive parents were less empathic. Both of these measures included items related to such things as understanding the needs of the child and understanding the affective experiences of the child. Therefore, in the present study, potential differences between at-risk and control mothers may have been minimized due to the use of the Interpersonal Reactivity Index which may not have been a sensitive

measure of parental empathy.

To summarize, it appears as if there may be a difference in at-risk mothers' abilities to be empathic towards strangers versus their own children. At-risk mothers may be capable of being empathic in hypothetical situations involving strangers but have difficulty being empathic with their own children. A possible reason for this discrepancy is that they may perceive their children as sources of frustration. Children of marginally maltreating families have been characterized as being anxious, disorganized, disruptive, and difficult to manage (Crittenden, 1988). In all likelihood, it may be difficult for at-risk mothers to feel empathic towards children who may be displaying these negative behaviors on a daily basis.

#### Experimental Conditions

In the present study, mothers watched a videotape of infants' facial expressions, then listened to hypothetical vignettes concerning their infants, and made self-reported attributions and reactions in response to those hypothetical behaviors. However, the demands of the situation in which mothers are required to make these types of responses are probably quite different in a laboratory setting versus the home environment. For example, the emotion recognition task used in the present study may not have reflected the ongoing processes of how mothers

recognize emotional expressions in more naturalistic contexts. In this study, mothers observed the infants' facial expressions without distraction and were given ample opportunity to identify the emotions in that each emotion segment was shown twice followed by a stop-frame. Under such conditions, it may have been easier for mothers to recognize the facial expressions. On the other hand, in a home environment, mothers may have competing demands (e.g., children fighting, overdue bills, marital discord) which could increase the likelihood of their failing to notice their infants' facial expressions. Such stressors are especially prevalent in high-risk family situations (e.g., Crittenden, 1988), and it may be that a performance deficit in emotion recognition is more likely to manifest itself in these types of situations.

A third possible explanation then for the findings that at-risk and control mothers responded similarly on most of the dependent measures is an ability versus performance discrepancy for at-risk mothers which may be influenced by the experimental context. Perhaps at-risk mothers do have the capabilities to recognize emotions accurately, to respond appropriately to child behaviors, and to be empathic in an experimental setting, but may fail to use these abilities in actual interactions with their children. Crittenden (1988) observed maltreating families interacting with their children and identified four groups

of maltreating families: abusing, neglecting, abusing and neglecting, and marginally maltreating. The at-risk mothers in the present study seemed to have the most in common with the marginally maltreating families in that these families were not currently involved in severe abuse and were either at-risk for abuse or had received treatment for their abuse. Crittenden (1988) characterized the marginally maltreating families as not being pervasively angry and as capable of being empathic with their children. However, these families lacked a coherent problem-solving strategy, rarely applied rules consistently, and typically made rules ad hoc to meet the needs of the immediate situation; this lack of organization led to internal chaos in the household and resulted in the parent racing from crisis to crisis. Discipline usually consisted of yelling and spanking followed with hugs and apologies.

Based on Crittenden's descriptions of the marginally maltreating families as being loving parents who are unable to create a stable and organized home environment for their children, it is possible that the results of the present study would have been different had at-risk mothers been observed at home. In a home environment which would likely be disorganized and stressful, at-risk mothers may have been more likely to respond insensitively and more harshly to their children's emotional states and behaviors.

### Relationships Among Constructs

The second overall goal of the present study was to investigate the relationships among affective, cognitive, and behavioral components for at-risk and control mothers. These relationships were investigated utilizing path analyses. The findings from these path analyses should be interpreted cautiously in light of the fact that post hoc modifications were made to the original model in order to improve its fit with the data that were obtained. At exploratory stages of research, modifications to the original model may be necessary to better understand the relationships among the constructs in the model (Pedhazur, 1982). However, replication using other samples of abusive and nonabusive mothers will be necessary to ascertain the reliability of the current findings and the general fit of the model.

The first model in this study examined the relationships among the constructs of emotion recognition, attributions, reactions, depression, and empathy for at-risk and control mothers. The potential impact of mother's education level on these relationships was also explored through the addition of mother's education to this first model. The second model was created due to the high correlational relationship that education level had with group membership and the self-reported reaction of punishment. The following sections will focus on the

similarities and differences between these two models of parenting styles.

Similarities across models. Several of the relationships remained relatively stable independent of mother's education level. First, for both models, at-risk mothers were more likely to be depressed; this result was also found in the ANCOVA. This finding is consistent with those from the Evans (1980), Lahey et al. (1984), and Mash et al. (1983) studies which found that physically abusive mothers were more depressed than control mothers.

Prevalence of depressive disorders in the general population has been reported to range from 4-11% (Devins & Orme, 1985); in the present study, using a CES-D cutoff score of 16 to indicate "case" depression, 64% of the at-risk mothers and 23% of the control mothers scored 16 or higher. Therefore, mothers in this study had a higher prevalence of depression compared to the general population. The mean values reported for total CES-D scores in the general population ranged from 7.5 to 12.7, with modal values centered around 8.5 (Devins & Orme, 1985); in the present study, the means for at-risk and control mothers were 20.03 and 11.93, respectively. Therefore, mothers in the present study were also somewhat more depressed when compared to the general population.

In light of previous research, the finding that at-risk mothers had a higher prevalence of depression and

were also more severely depressed compared to the general population was not surprising. However, the findings that the control mothers in the present study also had a higher prevalence rate of depression and a slightly higher mean CES-D score compared to CES-D modal values in the general population were not expected. One possible reason for the control mothers' increased prevalence of depression was that almost half of the them had given birth in the past year. Depression in women after childbirth is not an uncommon phenomenon; Grundy and Roberts (1975) reported that 60% of women experience postpartum blues and one year later have a recurrence rate of 20-30%. One implication is that the source of the mothers' depressed states in the present study may have been quite different for at-risk and control mothers. For at-risk mothers, environmental circumstances such as low socioeconomic status and low education may have contributed to their depression. For nonabusive mothers, their depression may in part be due to their recent childbirth experiences along with the associated life changes that an infant brings.

A second finding that was consistent for both models of parenting styles was that the more accurate a mother's emotion recognition abilities were, the higher her emotion intensity ratings. A related finding was that higher emotion intensity ratings were associated with nurturant responses. Both of these relationships have not been



previously explored in other studies. However, these findings support Lamb and Easterbrooks' model (1981) that an important first step that leads to sensitive caregiving is the ability to accurately perceive the child's emotional state.

Empathy was found to influence two constructs of interest for both models of parenting styles. The first finding was that mothers with higher levels of affective empathy were more likely to have a positive attributional bias for the causes of their children's behaviors. The positive influence of empathy on attributions, in the context of parent-child relationships, has not been previously reported. However, related research by Gould and Sigall (1977) and Melburg et al. (1984) explored the relationship between observers' empathy and attributions for the behaviors of strangers; they found that subjects given empathy instructions tended to have a positive attributional bias for a stranger's behavior. A second finding in the current study was that mothers with higher levels of affective empathy were more likely to report using nurturance. This finding is consistent with several other studies which have found that maternal empathy and comforting behaviors were positively correlated (e.g., Letourneau, 1981; Wiesenfeld et al., 1985). Therefore, the addition of the empathy construct to Lamb and Easterbrooks' original model (1981) of sensitive caregiving was important

because it was related to how mothers interpret and respond to their children's behaviors.

Another finding that held up across models was a positive relationship between attributions of causality and intentionality; mothers who were more likely to attribute their children's positive behaviors to internal causes and their children's negative behaviors to external causes were also more likely to attribute their children's positive behaviors to intentional factors and their children's negative behaviors to unintentional factors. This finding is consistent with Dix et al.'s (1986) study which linked parents' inferences about children's dispositions with beliefs about whether children intended their behavior; parents were less likely to perceive children as hostile, dishonest, or selfish if they thought that the children's negative behaviors were unintentional.

The final relationship that was unaffected by the addition of mother's education level to the first model was that mothers who made negative attributions for their children's behaviors were more likely to report that they would distract or interfere with their children's sharing behaviors. In order to gain a better understanding of why mothers would respond to their children's sharing behavior in this unusual manner, mothers' responses to the open-ended attributional question (see Appendix H) as to why their children were sharing were examined. It was

discovered that some mothers perceived the reason for their children's sharing behavior in a neutral fashion (e.g., child is only sharing because: the child likes to feed others, child wants sibling's approval, child is distracted). It may have been that in these instances some mothers felt it was appropriate to intrude on the child's sharing behavior by explaining to the child why he/she should not share, or by distracting the child.

Differences across models. The inclusion of mother's education level in the first model resulted in additional relationships among the constructs that were not previously identified. First, less educated mothers were more likely to use intrusion. Similar findings were reported by Egeland et al. (1979) who identified two groups of low-income mothers, Excellent Care and Inadequate Care, and found that the Inadequate Care group was less educated and more likely to interfere with the infants' activities compared to the Excellent Care group. Egeland et al. (1979) suggested that the Inadequate Care group's interference was a manifestation of the mothers' lack of understanding of the psychological complexities of the mother-infant relationship which may in part be due to their lower education level.

A second addition to the first model as a result of mother's education level was that mother's education level had an indirect effect on depression through group

membership; the finding was that less educated mothers were more likely to be depressed. The relationship between demographic variables and depression has been reported in several studies. For example, Belle and Dill (1982) and Warren and McEachern (1983) reported that elevated CES-D scores were significantly correlated with lower levels of socioeconomic status, education, and annual income.

The addition of mother's education level also changed some of the relationships among the constructs in the first model. The first change was that the direct effect of at-risk mothers being more likely to punish was replaced with the direct effect of less educated mothers being more likely to punish. Several studies have found that less educated parents make more use of physical punishment in disciplining their children (e.g., Gecas, 1979; Gerris, Vermulst, Franken, & Janssens, 1986).

The second change in the first model due to the addition of the construct of mother's education centers around the construct of intensity of emotion recognition. In the first model, depression and affective empathy directly influenced intensity of emotion recognition. With the addition of mother's education level, group membership replaced the direct effects of depression and affective empathy on intensity of emotion recognition. The finding was that at-risk mothers had lower intensity of emotion recognition scores. Given the high degree of

correspondence between mothers' accuracy ratings and intensity ratings, intensity ratings can be viewed as another indication of how well mothers perceive the target (correct) emotions. In this context, the finding that at-risk mothers had lower intensity ratings provides some support for an emotion recognition deficit. Kropp and Haynes (1987) also found that abusive mothers had emotion recognition deficits compared to nonabusive mothers.

Exploring the relationship between group membership and intensity ratings a bit further, what is known from the findings in the present study is that: (1) the at-risk mothers were significantly more depressed than the control mothers; and (2) depression was found to be associated with lower intensity of emotion recognition ratings in the first model without the addition of maternal education level. Therefore, one hypothesis is that the at-risk mothers' emotional states influenced their intensity ratings. Other studies have found that a depressed state impairs accuracy of emotion recognition (e.g., Walker et al., 1984; Zuroff & Colussy, 1986), so it may be likely that depression also affects intensity of emotion recognition.

General summary of the path analyses results. Two constructs, affective empathy and mother's education level, seemed to be of particular importance in the present study based on the number of significant relationships they had with the other constructs of interest. Affective empathy

was related to both cognitive and behavioral components of the model of parenting styles; specifically, affective empathy was related to the attributional ratings of causality and intentionality, as well as the reported reactions of nurturance and intrusion. Without the addition of mother's education level, affective empathy was also related to intensity of emotion recognition.

Mother's education level was also an important construct in the present study because it contributed an additional 10% of explained variance and it both changed and added relationships among the latent constructs. In particular, mother's education level was related to group membership and the self-reported reactions of punishment and intrusion. Although mother's education level could not explain all of the variance in maternal reactions, its' contribution to a further understanding of parent-child interactions should not be ignored. In fact, other studies have also reported the influence of demographic variables such as education level on parental behaviors. For example, Conger, McCarty, Yang, Lahey, and Kropp (1984) reported that social-demographic variables (e.g., maternal education, family income, and family size) accounted for as much as 36% of the variance in a measure of psychological risk for maladaptive parenting.

Although the findings from the path analyses are suggestive, there are several cautionary notes that need to

be emphasized. First, as mentioned earlier, several post hoc modifications were made to the original model and thus, the findings should be considered exploratory. Second, even though the findings reported were significant, the magnitude of these relationships was quite modest. For example, the path coefficient of  $-.24$  between attribution of causality and intrusion was significant in this study; what that means though is that attribution of causality only accounted for 6% of the variance in the intrusion construct. So although the significant findings are suggestive, it is important to keep the magnitude of those relationships in perspective.

A related issue is that most of the variance in the constructs is attributable to factors not included in the present study's models. For example, only 20% of the variance for the self-reported reaction of punishment was explained in this study; that leaves 80% of the variance for the punishment construct attributable to other factors outside of the model. Such factors may include cultural norms, a parental history of abuse, poor parenting skills, and noxious child behaviors.

#### Recommendations for Future Research

Currently, there is a lack of consistent findings across studies concerning abusive mothers' emotion recognition skills, the kinds of attributions they make for their children's behaviors, and how they interact with

their children. These inconsistencies may in part be due to the use of different types of abusive subjects (e.g., emotional abuse, physical abuse, neglect). Even though there are distinct differences among these forms of maltreatment, many studies continue to group all maltreating parents into one category which may lead to inconsistent findings.

For example, one inconsistency was that some studies found emotion recognition deficits in abusive mothers (Kropp & Haynes, 1987), and others did not (Camras et al., 1988; During, 1986). Kropp and Haynes (1987) failed to present sufficient information to determine the typology of abuse of their maltreating mothers. However, if the Kropp and Haynes (1987) sample had included neglecting mothers or abusive/neglectful mothers in their maltreating group, the number of emotion recognition errors would likely have been increased. The general lack of involvement of neglectful mothers may be associated with a reduced sensitivity to their children's emotional states and signals.

Therefore, one recommendation for future research which would facilitate the understanding of the complex nature of child abuse would be to include different types of abusive parents (e.g., physically abusive, neglectful, emotionally abusive) in a research project and compare their responses on the measures of interest. Also, by identifying the strengths and weaknesses of each group of



maltreating parents, more effective treatment programs can be developed to meet their individual needs. For example, physically abusive parents may not have emotion recognition deficits, but instead may need to be taught better child management techniques. However, neglecting parents may have emotion recognition deficits and before they can effectively interact with their children, they may need to be taught interpersonal skills such as recognizing their children's emotional states.

A second recommendation for future research is to conceptualize and develop measures of parental cognitions that are relevant to the developmental level of the child. Assessing parental attributions for infants' behaviors is a case in point. In the present study it was necessary to develop a measure of assessing mothers' attributions for their infants' behaviors based on attributional measures developed for older children. However, adapting child attributional measures to make them applicable for infants may not have been an appropriate strategy since parents' attributions for infant and child behaviors may not be conceptually similar. Infants do not have the same developmental skills as older children, and it appears that parents use their knowledge of children's developmental skills when making attributions. For example, Dix et al. (1986) assessed parents' attributions for children ranging in ages from 4 to 12 years old and found that

parents' assessments of children's behaviors were closely tied to the developmental level of the child; as children developed, parents were more likely to attribute children's behavior to dispositional and intentional factors. Also, attributional dimensions that are applicable for older children, such as stability of the behavior and generalizability of the behavior, are probably not appropriate for infants. Therefore, more research is needed to assess the ways in which parents think about their infants' behaviors.

A third recommendation for future research would be to continue to explore the relationship between parental beliefs and parental behaviors. Even though the majority of hypothesized relationships between maternal attributions and reactions were not significant in the present study (the one exception being attribution of causality influencing maternal intrusion), it is premature to assume that there is not a relationship between them. In fact, it seems to be very difficult to establish significant relationships between beliefs and behaviors. Goodnow (1988) and Miller (1988) have reviewed the few studies that have assessed the relationship between parental cognitions and actual parental behaviors and found that the relationships are relatively small in magnitude. Sigel (1986) commented that the link between beliefs and behaviors is much more complicated than people have

realized because beliefs and behaviors can take a variety of forms and both have multiple determinants. Goodnow (1988), Miller (1988), and Sigel (1986) have made several recommendations to increase the correspondence between parental beliefs and their actual behaviors. One recommendation is to assess the pattern of parental beliefs and observe parents interacting with their children in a variety of situations rather than using one index of beliefs and behaviors. Applying this recommendation to the present study, perhaps relationships between parental cognitions and behaviors would have been more likely if several types of cognitions were assessed (e.g., attitudes towards childrearing, perceived self-efficacy in the role of the parent, expectations for their children, attributions for their children's behaviors) and mothers had been observed interacting with their children in different types of situations (e.g., task performance, unstructured play, mealtime).

#### Treatment Implications

In the present study, the only large group difference was that at-risk mothers were significantly more depressed than the control mothers. One contributing factor to the at-risk mothers' depressed mood was their education level; lower education levels were associated with elevated CES-D scores. Therefore, one focus of treatment for these at-risk mothers might be to encourage them to continue

their education. Most of the at-risk mothers in this study had only completed tenth or eleventh grade, so one goal for them might be to finish high school. There are several positive outcomes that at-risk mothers may experience as a result of returning to school: less depression; improvement in their self-esteem and self-confidence; an increased probability of finding better paying jobs; and an increase in the number of social contacts they make outside of their family. All these benefits may then positively influence the ways in which these mothers interact with their children.

A second treatment implication would be to teach at-risk mothers specific skills that would improve their interactions with their children. In the present study, two factors appeared to be particularly important influences on maternal reactions to positive and negative child behaviors. First, tasks could be designed to improve mothers' emotion recognition skills since intensity of emotion recognition was found to influence the self-reported reaction of nurturance. A second area of training could be to improve at-risk mothers' abilities to feel empathic towards their children; the present study found that affective empathy influenced both mothers' attributions and reactions.

One possible explanation for the failure to find significant group differences in the present study is that

at-risk mothers may know how to be nurturant with their children and recognize their children's cues but may resort to ineffective parenting strategies when experiencing stress or arousal. If this is the case, then future work might involve training abusive mothers to use several tactics designed to reduce their stress and arousal levels. For example, these mothers could be trained to use coping strategies such as relaxation training or cognitive restructuring when they are feeling highly aroused by their children's negative behaviors.

### Conclusions

To conclude, parenting is complex process, and involves several dimensions such as parental affect, cognitions, and behaviors. However, many studies continue to focus on single factors in isolation in order to explain parenting behaviors such as child abuse. Had this been the sole approach of the present study, few differences were found between at-risk and control mothers on each of the dependent measures.

Instead, to promote a better understanding of the interrelationships among the affective, cognitive, and behavioral factors of childrearing, clearly articulated conceptual models and statistical analyses directed at capturing the complexity of parenting will be necessary. The current study represented an initial attempt to adopt such an approach using path analyses, and found that

mother's education level, the ability to recognize children's emotional states, and affective empathy were all important constructs that influenced parenting styles.

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## Appendix A

Recruitment of Control Mothers From CommunityHealth Clinics

Health Clinic	Number of Forms Returned	Number of Acceptances	Number of Declines	Telephone Disconnected
Downtown	2	1	0	1
Forest Lawn	17	14	1	2
Haysboro	5	4	1	0
North Hill	3	3	0	0
Northgate	6	6	0	0
Ranchlands	0	0	0	0
Scarboro	1	0	1	0
Shaganappi	10	8	2	0
South District	2	1	1	0
Thornhill	5	3	2	0
Village Square	2	2	0	0
TOTALS	53	42	8	3

## Appendix B

Emotion Rating Checklist Used in Pilot Study

Please complete the following information:

Age:\_\_\_\_\_ Sex:\_\_\_\_\_ Major:\_\_\_\_\_ Year:\_\_\_\_\_

Are you a parent?\_\_\_\_\_

If yes, how many children do you have? \_\_\_\_\_

Ratings of Degree of Presence of Six Emotions

Instructions: Circle the degree to which you felt each emotion was present in the videotape that you just saw.

## Degree of Presence of Each Emotion

Categories of Emotion	Not at All	Somewhat			Moderately		Quite	Very	
	1	2	3	4	5	6	7	8	9
Anger	1	2	3	4	5	6	7	8	9
Pain	1	2	3	4	5	6	7	8	9
Joyful/Happy	1	2	3	4	5	6	7	8	9
Interested	1	2	3	4	5	6	7	8	9
Sad	1	2	3	4	5	6	7	8	9
Surprised	1	2	3	4	5	6	7	8	9

Appendix C  
Four Sequences of Emotion Segments

Sequence 1	Sequence 2	Sequence 3	Sequence 4
Surprise1	Interest1	Sadness2	Pain2
Pain2	Sadness2	Interest1	Joy2
Anger1	Anger1	Surprise2	Anger2
Interest2	Surprise2	Anger2	Interest2
Anger2	Pain1	Joy1	Surprise1
Sadness1	Joy1	Sadness1	Sadness1
Joy2	Anger2	Interest2	Joy1
Sadness2	Interest2	Surprise1	Anger1
Joy1	Surprise1	Pain1	Interest1
Interest1	Pain2	Anger1	Pain1
Pain1	Joy2	Joy2	Sadness2
Surprise2	Sadness1	Pain2	Surprise2

## Appendix D

Description of Four Vignettes of Positive and Negative  
Infant Behaviors

Practice Story: You return home and hear your child crying loudly. The babysitter tells you that your child has been crying for over 20 minutes and she could not get him/her to stop crying.

Negative-  
Yells:

1. It is late in the evening and you decide it is time for your child to go to bed. You put your child in the crib and he/she starts to scream and yell.

Negative-  
Breaks Something:

2. You are holding your child on your lap and he/she breaks your necklace.

Positive-  
Task Success:

3. Your child is playing with a new game in which he/she must fit each piece which is a different shape such as a circle, triangle and square through a hole of the same shape. Your child is able to put all of the pieces through the right shaped holes on the first try.

Positive-  
Sharing:

4. You give your child his/her favourite treat and he/she offers some of the treat to your older child.

## Appendix E

Four Sequences of Vignettes of Infant Behaviors

---

Sequence #1	Sequence #2	Sequence #3	Sequence #4
<hr/>			
Story 4	Story 3	Story 2	Story 1
Story 1	Story 2	Story 3	Story 4
Story 3	Story 1	Story 4	Story 2
Story 2	Story 4	Story 1	Story 3

---

## Appendix F

Emotion Rating Checklist

Instructions: Circle the number corresponding to the degree to which you felt each emotion was present in the videotape that you just saw. Try to pick one dominant emotion and give that emotion the highest rating compared to the other emotions.

Categories of Emotion	Degree of Presence of Each Emotion								
	Not at All	Somewhat		Moderately		Quite		Very	
	1	2	3	4	5	6	7	8	9
Anger	1	2	3	4	5	6	7	8	9
Pain	1	2	3	4	5	6	7	8	9
Joyful/Happy	1	2	3	4	5	6	7	8	9
Interested	1	2	3	4	5	6	7	8	9
Sad	1	2	3	4	5	6	7	8	9
Surprised	1	2	3	4	5	6	7	8	9

How confident are you that this is the most dominant expression (the dominant expression is the emotion that you gave the highest rating to)?

Not at All Confident	Somewhat		Moderately		Quite		Very Confident	
<hr/>								
1	2	3	4	5	6	7	8	9

## Appendix G

Descriptive Information Concerning Mothers' Responses to  
Open-Ended Attribution of Causality Question for Infants'

Negative Behaviors

	Percentage of Control Mothers	Percentage of At-Risk Mothers
<u>Negative-</u>		
<u>Yells:</u>		
1. Child did not want to go to bed	19	71
2. Child is overtired	19	00
3. Child is interested in activity outside bedroom	15	00
4. Child is not sleepy	11	07
5. Child is ill or in pain	11	14
6. Child does not like to be left alone	09	00
7. Child wants to be held	06	00
8. Child has dirty diapers	02	00
9. Child is afraid of the dark	02	00
10. Child is hungry	02	00
11. Child is lonely	02	00
12. It's the child's normal bedtime routine	02	00
13. Child is spoiled	00	07
<u>Negative-</u>		
<u>Breaks Something:</u>		
1. Child is curious	77	79
2. Child wants to feel it	11	00
3. Child is just playing	11	07
4. Child is bored	02	00
5. Child wants a hug	00	07
6. Child wants to wear it	00	07



## Appendix H

Descriptive Information Concerning Mothers' Responses to  
Open-Ended Attribution of Causality Question for Infants'

Positive Behaviors

	Percentage of Control Mothers	Percentage of At-Risk Mothers
<u>Positive-</u> <u>Task Success:</u>		
1. Child is intelligent	25	29
2. Child is skilled	15	00
3. Child has learned from watching others	13	21
4. Child is lucky	13	29
5. Child is curious	06	00
6. Child has good eye-hand coordination	06	14
7. Child is developmentally normal	06	00
8. Child is highly stimulated	04	00
9. Child likes challenges	04	00
10. Child is persistent	02	00
11. Child concentrated	02	00
12. Child learns through repetition	02	00
13. Child wants to please Mom	02	00
14. Child wants Mom's attention	00	07
<u>Positive-</u> <u>Sharing:</u>		
1. Child has been taught to share	30	43
2. Child loves older sibling	19	00
3. Child is generous	15	21
4. Child is empathic/kind	09	00
5. Child is in a good mood	06	00
6. Child wants sibling's approval	06	36
7. Child likes to feed others	06	00
8. Child is not hungry	06	00
9. Child is distracted	02	00

## Appendix I

Interpreting Your Child's Behavior

Here are some questions about your child's behavior in the story that you have just heard.

1) Please write in this space what you think would be the most likely reason for your child's behavior \_\_\_\_\_

---



---

2) How likely is it that your child's behavior was due to something about the way he/she is, or due to something going on around the child?

Very likely  
to be due to  
something  
about the way  
the child is

Likely to be  
both the way  
the child is and  
something going  
on around the child

Very likely to  
be due to some-  
thing going on  
around the child

1

2

3

4

5

3) Is your child's behavior intentional or is it an accident (unintentional)?

Very  
Intentional

Neither  
Intentional or  
Unintentional

Very  
Unintentional

1

2

3

4

5

## Appendix J

Ways of Handling Child Behaviors

Instructions: Please indicate with a circle for each item how likely it would be for you to use that method. I would like to know what you, as a mother, would do, not what you think someone else might think you should do.

	Very Unlikely 1	2	Not Sure 3	4	Very Likely 5
1) Yell at him/her	1	2	3	4	5
2) Praise or reward him/her	1	2	3	4	5
3) Do nothing - normal behavior	1	2	3	4	5
4) Smile at him/her	1	2	3	4	5
5) Spank with hand	1	2	3	4	5
6) Explain why he/she should not act that way	1	2	3	4	5
7) Pick him/her up and hug	1	2	3	4	5
8) Put him/her by himself/herself	1	2	3	4	5
9) Distract him/her	1	2	3	4	5
10) Do something else (please write in what you would do)					

Appendix K  
CES-D Scale

Circle the number for each statement which best describes how often you felt or behaved this way - DURING THE PAST WEEK.

	Rarely or None of the Time (Less than 1 Day)	Some or a Little of the Time (1-2 Days)	Occasionally or a Moderate Amount of Time (3-4 Days)	Most or All of the Time (5-7 Days)
1. I was bothered by things that usually don't bother me	0	1	2	3
2. I did not feel like eating; my appetite was poor	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family or friends	0	1	2	3
4. I felt that I was just as good as other people	0	1	2	3
5. I had trouble keeping my mind on what I was doing	0	1	2	3
6. I felt depressed	0	1	2	3
7. I felt that everything I did was an effort	0	1	2	3
8. I felt hopeful about the future	0	1	2	3
9. I thought my life had been a failure	0	1	2	3
10. I felt fearful	0	1	2	3
11. My sleep was restless	0	1	2	3
12. I was happy	0	1	2	3
13. I talked less than usual	0	1	2	3
14. I felt lonely	0	1	2	3
15. People were unfriendly	0	1	2	3
16. I enjoyed life	0	1	2	3
17. I had crying spells	0	1	2	3
18. I felt sad	0	1	2	3
19. I felt that people disliked me	0	1	2	3
20. I could not get "going"	0	1	2	3

## Appendix L

Interpersonal Reactivity Index

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate number on the scale at the top of the page: 0, 1, 2, 3, or 4. Answer as honestly as you can. Thank you.

## ANSWER SCALE:

0	1	2	3	4
Does Not				Describes
Describe				Me Very
Me Well				Well

Cognitive Empathy Scale:

3. I sometimes find it difficult to see things from the "other guy's" point of view.
8. I try to look at everybody's side of a disagreement before I make a decision.
11. I sometimes try to understand my friends better by imagining how things look from their perspective.
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.
21. I believe there are two sides to every question and try to look at them both.
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while.
28. Before criticizing somebody, I try to imagine how I would feel if I were in their place.

Affective Empathy Scale:

2. I often have tender, concerned feelings for people less fortunate than me.
4. Sometimes I don't feel sorry for other people when they are having problems.
9. When I see someone being taken advantage of, I feel kind of protective towards them.
14. Other people's misfortunes do not usually disturb me a great deal.
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them.
20. I am often quite touched by things that I see happen.
22. I would describe myself as a pretty soft-hearted person.

Fantasy Scale:

1. I daydream and fantasize, with some regularity, about things that might happen to me.
5. I really get involved with the feelings of the characters in a novel.
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it.
12. Becoming extremely involved in a good book or movie is rare for me.
16. After seeing a play or movie, I have felt as though I were one of the characters.
23. When I watch a good movie, I can very easily put myself in the place of a leading character.
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.

Personal Distress Scale:

- 6. In emergency situations, I feel apprehensive and ill-at-ease.
- 10. I sometimes feel helpless when I am in the middle of a very emotional situation.
- 13. When I see someone get hurt, I tend to remain calm.
- 17. Being in a tense emotional situation scares me.
- 19. I am usually pretty effective in dealing with emergencies.
- 24. I tend to lose control during emergencies.
- 27. When I see someone who badly needs help in an emergency, I go to pieces.





\*\*\*\*\*

ITEM

YES SUSPECT NO DON'T  
KNOW

\*\*\*\*\*

16. The mother regularly left her child alone inside the house after dark.
17. The mother regularly left her child alone inside the house during the day.
18. On at least one occasion, the mother left her child alone all night.
19. The mother regularly left her child alone outside the house during the day.
20. The mother regularly left her child with other people, without knowing who would assume responsibility and be in charge.
21. The mother lives with her child in a house. A window in a room where the child plays has been broken for some time and the glass has very jagged edges.
22. The mother dresses her son in girl's clothing, sometimes putting makeup on him. She keeps long curls on him.
23. The child is severely emotionally disturbed. The mother refuses to accept treatment for herself or for her child.
24. The child has severe behavior problems. The mother refuses to accept treatment for herself or for her child.
25. The mother is constantly screaming at her child, calling him/her foul names.
26. The mother ignores her child most of the time, seldom talking with him/her or listening to him/her.
27. The mother dresses her daughter in boy's clothing and keeps her hair cropped short like a boy's.
28. The mother constantly compares her child with his/her other sibling, sometimes implying that the child is not really her own.
29. The mother allows her child to stay around when she has people over to experiment with drugs.

\*\*\*\*\*

ITEM

YES SUSPECT NO DON'T  
KNOW

\*\*\*\*\*

30. The mother experimented with drugs while alone taking care of her child.
31. The mother uses drugs occasionally, but a friend or relative, who is an addict, visits her home often and has used drugs in front of her child.
32. The mother became very drunk while alone taking care of her child.
33. The mother got very high on drugs while alone taking care of her child.
34. The mother allows her child to stay around when she has drinking parties.
35. The mother leaves bottles of alcohol around the house in places where her child can get to them.
36. The mother lets her child sip out of her glass when she is drinking alcohol.
37. The mother is a modest drinker, but a friend or relative, who is an alcoholic, visits her home often, drinking constantly in front of her child.
38. The mother ignored the fact that her child was obviously ill, crying, constantly, or not eating.
39. The mother ignored her child's complaint of an earache or chronic ear drainage.
40. The mother leaves her child on a filthy, sodden mattress.
41. The mother has repeatedly failed to keep medical appointments for her child.
42. The mother does not wash her child at all.
43. The mother does not provide any health care for her child.
44. The mother does not wash her child's hair or bathe him/her for weeks at a time.
45. The mother has not given her child medication prescribed by a physician.

\*\*\*\*\*

ITEM

YES SUSPECT NO DON'T  
KNOW

\*\*\*\*\*

46. The mother makes no effort to keep her child clean.
47. The mother fails to prepare regular meals for her child.  
The child has had to fix his/her own supper.
48. The mother has not taken her child to a dentist.
49. The mother lives with her child in a hotel/motel apartment.  
There are no adequate cooking facilities.
50. The mother lives with her child in a house/apartment. No  
one ever straightens up.
51. The mother has failed to obtain an eye examination for  
her child.
52. The mother does not see to it that her child has clean  
clothing.
53. The mother insists that her child clean his/her plate,  
which she heaps full of food.
54. The mother does not see to it that her child brushes  
his/her teeth.
55. The mother frequently keeps her child out of school.
56. The mother knows her child is often truant, but she  
doesn't do anything about it.
57. The mother frequently lets her school-age child stay  
home from school for no reason.
58. The mother does not see to it that her child does any  
homework. She lets him/her watch TV all evening.

Length of time mother has been receiving treatment at your program:

\_\_\_\_\_  
(years/months)

Please indicate how much of the following training the client has received in your treatment program:

Not at All      Moderate Amount      Extensive Amount

- a) to be more sensitive to her  
    children's emotional cues
- b) her depression
- c) to show more concern for her  
    children
- d) to alter her expectations and  
    attitudes towards her  
    children's behaviors

Would you classify this client as being physically abusive or at-risk for physical  
abuse? \_\_\_\_\_

## Appendix N

Severity Ratings of the Child Maltreatment Checklist

Note: The severity ratings were based on the ratings of 313 professional respondents to the original maltreatment checklist. Ratings are on a scale from 1 to 9, with 1 indicating least serious and 9 indicating most serious.

## SEVERITY RATING

PHYSICAL ABUSE (6 items)

1. The mother burned her child.	8.45
2. The mother immersed her child in hot water.	7.88
3. The mother hit her child in the face.	6.98
4. The mother banged her child against the wall.	6.95
5. The mother struck her child with an instrument.	6.23
6. The mother usually punishes her child by spanking him/her.	4.76

SEXUAL ABUSE (6 items)

7. On at least one occasion, the mother and her child engaged in sexual intercourse.	8.24
8. On at least one occasion, the mother and her child engaged in mutual masturbation.	7.27
9. The mother, on at least one occasion, suggested to her child that they have sexual relations.	7.05
10. The mother, on at least one occasion, showed her child pornographic pictures.	6.13
11. On at least one occasion, the mother fondled her child's genital area.	6.02
12. The mother has intercourse where her child can see her.	5.04

FOSTERING DELINQUENCY (2 items)

13. The mother encourages her child to steal articles.	6.66
14. The mother encourages her child to take stolen merchandise to a store that sells it illegally.	6.42

## SEVERITY RATING

LACK OF SUPERVISION (7 items)

- |   |      |
|---|------|
| 15. The mother regularly left her child alone outside the house after dark.   | 6.20 |
| 16. The mother regularly left her child alone inside the house after dark.  | 6.13 |
| 17. The mother regularly left her child alone inside the house during the day.  | 5.59 |
| 18. On at least one occasion, the mother left her child alone all night.  | 5.55 |
| 19. The mother regularly left her child alone outside the house during the day.   | 4.57 |
| 20. The mother regularly left her child with other people, without knowing who would assume responsibility and be in charge.                                | 4.45 |
| 21. The mother lives with her child in a house. A window in a room where the child plays has been broken for some time and the glass has very jagged edges. | 4.12 |

EMOTIONAL MISTREATMENT (7 items)

- |   |      |
|---|------|
| 22. The mother dresses her son in girl's clothing, sometimes putting makeup on him. She keeps long curls on him.                  | 5.93 |
| 23. The child is severely emotionally disturbed. The mother refuses to accept treatment for herself or for her child.             | 5.55 |
| 24. The child has severe behavior problems. The mother refuses to accept treatment for herself or for her child.                  | 5.03 |
| 25. The mother is constantly screaming at her child, calling him/her foul names.  | 4.95 |
| 26. The mother ignores her child most of the time, seldom talking with him/her or listening to him/her.                           | 4.64 |
| 27. The mother dresses her daughter in boy's clothing and keeps her hair cropped short like a boy's.                              | 4.63 |
| 28. The mother constantly compares her child with his/her other sibling, sometimes implying that the child is not really her own. | 4.56 |

## SEVERITY RATING

DRUG/ALCOHOL ABUSE (9 items)

- |  |      |
|--|------|
| 29. The mother allows her child to stay around when she has people over to experiment with drugs.  | 6.14 |
| 30. The mother experimented with drugs while alone taking care of her child.   | 5.44 |
| 31. The mother uses drugs occasionally, but a friend or relative, who is an addict, visits her home often and has used drugs in front of her child.  | 5.09 |
| 32. The mother became very drunk while alone taking care of her child.   | 4.80 |
| 33. The mother got very high on drugs while alone taking care of her child.  | 4.61 |
| 34. The mother allows her child to stay around when she has drinking parties.  | 4.11 |
| 35. The mother leaves bottles of alcohol around the house in places where her child can get to them.   | 4.07 |
| 36. The mother lets her child sip out of her glass when she is drinking alcohol.   | 3.86 |
| 37. The mother is a modest drinker, but a friend or relative, who is an alcoholic, visits her home often, drinking constantly in front of her child. | 3.52 |

FAILURE-TO-PROVIDE (17 items)

- |  |      |
|--|------|
| 38. The mother ignored the fact that her child was obviously ill, crying, constantly, or not eating. | 6.81 |
| 39. The mother ignored her child's complaint of an earache or chronic ear drainage.                  | 6.08 |
| 40. The mother leaves her child on a filthy, sodden mattress.  | 5.77 |
| 41. The mother has repeatedly failed to keep medical appointments for her child.                     | 5.67 |
| 42. The mother does not wash her child at all.   | 5.50 |
| 43. The mother does not provide any health care for her child.                                       | 5.35 |
| 44. The mother does not wash her child's hair or bathe him/her for weeks at a time.                  | 5.00 |

## SEVERITY RATING

45. The mother has not given her child medication prescribed by a physician.	4.58
46. The mother makes no effort to keep her child clean.	4.55
47. The mother fails to prepare regular meals for her child. The child has had to fix his/her own supper.	4.15
48. The mother has not taken her child to a dentist.	3.90
49. The mother lives with her child in a hotel/motel apartment. There are no adequate cooking facilities.	3.62
50. The mother lives with her child in a house/apartment. No one ever straightens up.	3.61
51. The mother has failed to obtain an eye examination for her child.	3.44
52. The mother does not see to it that her child has clean clothing.	3.31
53. The mother insists that her child clean his/her plate, which she heaps full of food.	3.31
54. The mother does not see to it that her child brushes his/her teeth.	2.79

EDUCATIONAL NEGLECT (4 items)

55. The mother frequently keeps her child out of school.	4.56
56. The mother knows her child is often truant, but she doesn't do anything about it.	4.44
57. The mother frequently lets her school-age child stay home from school for no reason.	4.22
58. The mother does not see to it that her child does any homework. She lets him/her watch TV all evening.	3.09



## Appendix O

Explanation Given to Mothers by Their Case Worker

There is a graduate student from the University of Calgary named Kelly Marchand and she has asked me to invite you to participate in her research project at the University of Calgary. She and Dr. Mash are interested in learning more about how mothers recognize children's facial expressions.

The project will involve three parts. In the first part, you will watch facial expressions of young children on a television screen and you will be asked to circle on a sheet the emotions that they are experiencing. Then you will be asked to complete two short forms which look at what you would feel and think in a variety of situations. Finally, you will be asked how you would respond to children's behaviors. All of this will take about an hour and a half. Also, you will receive 15 dollars for participating in this project.

I would like to stress the fact that your participation is strictly voluntary and if you decide not to participate, it will in no way affect your treatment. If you do decide to help with this project, only Kelly and Dr. Mash will have access to your results. Also, you have the option of allowing our program to have access to your results. To ensure your privacy, your name, address and telephone number will not appear on any of the forms that you complete.

If you are interested in participating in the study, I will give Kelly your name and telephone number and she will call you to set up your meeting at the university or here at the hospital. Would you like to participate in this study?

If the mother indicates that she is interested, the case worker will also ask her if there are times when she would prefer Kelly to call her.

If the mother is not interested, the case worker will thank her for listening and to let the case worker know if she changes her mind.

## Appendix P

Poster for Community Health Clinics

\*\*\*\*\*

NOTICE TO ALL MOTHERS!

\*\*\*\*\*

I AM A GRADUATE STUDENT AT THE UNIVERSITY OF  
CALGARY AND I WILL PAY MOTHERS \$15 FOR THEIR  
PARTICIPATION IN MY PROJECT.

I AM INTERESTED IN LEARNING MORE ABOUT HOW  
MOTHERS RECOGNIZE CHILDREN'S FACIAL EXPRESSIONS.

IF YOU WOULD LIKE MORE INFORMATION ABOUT THIS  
PROJECT, PLEASE ASK THE RECEPTIONIST FOR THE LETTER  
WHICH DESCRIBES THIS PROJECT.

THANK-YOU!

KELLY MARCHAND

## Appendix Q

Letter to Control Mothers Describing Project

Dear Mother,

My name is Kelly Marchand and I am a graduate student in the Department of Psychology at the University of Calgary. Dr. Eric Mash and I are interested in learning more about how mothers recognize children's facial expressions. The study we are conducting is at the University of Calgary and will involve two parts. In the first part, you will watch facial expressions of young children on a television screen and you will be asked to identify which emotions the children are experiencing. Then you will be asked to complete two short forms which look at what you would think and feel in a variety of situations. All of this will take you about an hour and a half. To compensate you for your time and effort in the study, you will receive 15 dollars!

If you are interested in participating in the study, please provide your name and telephone number at the bottom of this page. When I have received all the forms, I will be contacting mothers to participate in the study. At that time, I will answer any questions you might have and arrange our meeting at the university. Your help with the study will be greatly appreciated.

If you are not interested in participating in the study, please return this letter to the receptionist.

Thank-you for taking the time to read this letter!

Sincerely,

Kelly Marchand

Name: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Please indicate if there are times when you would prefer that I telephone you: \_\_\_\_\_

PLEASE RETURN THIS LETTER TO THE RECEPTIONIST WHEN YOU ARE FINISHED.

## Appendix R

Procedure for Recruitment of Control Mothers with  
Older Children

"Hello, could I speak to \_\_\_\_\_ please? This is Kelly Marchand calling from the Family Study Project. In case you don't remember, I'm the student interested in how mothers recognize infant facial expressions. I would like to speak with you for a couple of minutes, if you don't mind. Even though I hadn't planned to telephone at the time I met with you, I didn't realize that I would need more mothers. So I'm telephoning all the mothers who were in my study, like yourself, to see if they have any friends with children older than five years who would like to participate in my study. Right now I have a lot of mothers with younger children, so I need more mothers with older children."

If mother says no, ----"Well thank-you for taking the time to talk with me and I enjoyed talking with you again. Have a Merry Christmas!"

If mother says yes ----"Great! I really appreciate your help. I will give you my telephone numbers (home and office) where your friends can reach me if they are interested in participating in my study. The study is the same as when you had participated and your friends will receive 15 dollars. Please just tell your friends that I am interested in how mothers recognize children's facial expressions. It is important that I explain the details of the study myself, so please don't go into detail about the study. If your friends have any questions, I would be more than happy to answer them."

"Thank-you very much for your time and effort in helping me find additional mothers. I really enjoyed talking with you again. I hope to hear from your friends very soon and I hope you have a wonderful Christmas!"

## Appendix S

Initial Telephone Contact with Mothers

"Hello is Ms. \_\_\_\_\_ in?"

If no, ask "Is there a good time for me to call again, when she is likely to be at home?"

If yes, say " Hello, Ms. \_\_\_\_\_. This is Kelly Marchand calling from the Family Study Project. I am the person interested in how mothers recognize children's facial expressions that you read about at the health clinic (or heard about from your case worker) and you indicated that you would be interested in participating in this project. I would like to speak with you for a few minutes about your participation in our project.

Is this a good time for you to talk, or would you prefer that I call back?"

If no, say "When would be a good time to do this?"

Fine, I will look forward to talking with you at that time."

If yes, say " First, thank you for taking the time to provide your name and telephone number. As has been explained before, I am interested in how mothers recognize children's facial expressions, how they interpret their children's behaviors and how they respond to their children. Since this project is greatly dependent on mothers like yourself, I would greatly appreciate your participation. Also, I would like to remind you that you will receive 15 dollars for participating in this study. If you do decide to participate in this project, you will be asked to come to the university (or I will meet you at the hospital). To make it easier for you, I will be sending you directions as well as visitor parking permits or bus passes. I will arrange to meet you as soon as you get to the university (or the hospital) so that you will not have to worry about finding the building that I am in.

Are you still interested in participating in this project?"

If no, then say "Thank you so much for giving me the time that you already have."

If yes, say "That's great."

1) "When would be a good time for you to come to the university (or hospital)? Can we set up a time now that is convenient for you?"

Initial contact continued .....

"We can meet during the day or at night or even on weekends, whichever time suits you best."

2) How do you plan to come to the university?

a) by car - "I will send you a visitor's parking permit with instructions of where to park. Also, I will be meeting you at the entrance of the parking lot and to help you recognize me, I will send you a photograph of me."

b) by bus - "I will send you bus tickets along with suggestions of which buses you can take to get to the university. Also, I will be meeting you when you get off of the bus. To help you recognize me, I will send you a photograph."

c) by LRT - "I will send you transit tickets and I will meet you at the LRT Station. To help you recognize me, I will send you a photograph."

3) "Will you be bringing your child? I would prefer if you could make arrangements to leave your child at home. However, if it is not convenient for you, I can arrange to have a babysitter here at the university."

4) "May I have your address so that I can send this off to you as soon as possible? Also, I will send you a sheet with the date and time of your appointment and my telephone number in case you need to postpone our meeting or have any questions."

5) "Finally, I will telephone you on the day before our meeting just to remind you and to make sure that you are able to come that day."

"Thank-you very much for being so cooperative and I look forward to meeting you. Before we finish, do you have any questions that you would like to ask?"

## Appendix T

Explanation Given to Mothers

First of all, I would like to thank you for coming here today. Dr. Eric Mash and I are interested in learning more about how mothers recognize children's facial expressions, how mothers think about their children, and how mothers respond to their children. Hopefully, information about how mothers think about and deal with their children will help us to better understand what it means to be a parent today. In addition, we feel that you will find the opportunity to think about your own opinions and attitudes in this area both interesting and useful.

Before we begin, I will explain the project to you and if you have any questions while I'm explaining things to you, please feel free to ask. I will first ask you to complete a general information form which asks such things as your education level, your husband's occupation, and the ages and sex of your children. If you are uncomfortable answering any of the questions, then please leave them blank. Next, you will be watching videotapes of facial expressions of young children in a variety of situations on this television screen (show mother the television) and you will be asked to identify the emotions that they are experiencing. I want to stress that there are no right or wrong answers; I am just interested in how you recognize emotions. We will do some practice trials together so that you will be comfortable with this part of the study. I will show you each videotape two times and then I will pause the tape. It is then that you will make your ratings and you will have as much time as you need. All the videotapes will be without sound and all will be shown in black and white. Do you have any questions about this part of the study? (If mother does not, then proceed to next step; if mother has questions or comments then the researcher will discuss them with her.)

Next, you will be asked to complete two short forms. One form looks at what you would think and feel in a variety of situations and the second form looks at how you have been feeling lately. When it is time to fill out these forms, I will go over them with you in more detail.

Finally, I will read you some short stories involving typical mother-child interactions and I want you to imagine that the stories are about you and (name of child). I will be asking you why you think the child behaved the way he/she did and how you would respond to the child's behavior. Once again there are no right or wrong ways to respond since every mother has her own way of dealing with her child's behaviors.

All of this will take you about 90 minutes. Also, to compensate you for your time and effort in the study, you will receive 15 dollars when we have finished.

## Appendix U

Consent Form for Mothers

I would like to participate in this study. I understand that my consent to participate in this study is strictly voluntary and that I may withdraw my participation at any time. This withdrawal will in no way affect my treatment at NAME OF AGENCY (Note: this sentence only applies to at-risk mothers). I understand that upon completion of my participation, I will receive 15 dollars.

Kelly Marchand has explained the project to me and I understand what I will be asked to do:

- 1) provide general information about my family
- 2) identify infants' facial expressions displayed on a television screen
- 3) fill out two forms which ask questions about how I would feel in a variety of situations
- 4) listen to hypothetical stories about my child and provide my interpretations of the child's behavior and how I would likely respond.

I understand that all the information that I provide will be held in the strictest confidence, and that my name, address, or telephone number will not appear on any of the forms that I complete. I understand that only Kelly, Dr. Mash, and NAME OF AGENCY will have access to my results (Note: this sentence only applies to at-risk mothers). I understand that once all the information has been collected, I will receive a written summary of the findings of this study. I understand that all results of the study will be published as a group of findings so that I will never be identified.

Signed: \_\_\_\_\_

Name: (please print) \_\_\_\_\_

Date: \_\_\_\_\_

Investigator: \_\_\_\_\_



## Appendix V

General Information Form

Note: If you feel uncomfortable answering a certain question, please leave it blank.

1. What is your birthdate?: \_\_\_\_\_  
(day / month / year)
2. What is your occupation? \_\_\_\_\_  
Is this full-time or part-time work?: \_\_\_\_\_
3. What is your marital status?: (please check one)  
☐ single    ☐ divorced/separated    ☐ widowed  
☐ married or in a common-law relationship
4. What is the highest level of education you have completed?:  
☐ grade school    ☐ some high school    ☐ high school  
☐ some college or university    ☐ technical school  
☐ university    ☐ graduate school
5. If you are married or in a common-law relationship, please answer the following questions.  
 If you are not, please go on to Question 6.
  - a) What is the occupation of your partner?: \_\_\_\_\_
  - b) Is this full-time or part-time? \_\_\_\_\_
  - c) What is the highest level of education your partner has completed?:  
☐ grade school    ☐ some high school    ☐ high school  
☐ some college or university    ☐ technical school  
☐ university    ☐ graduate school    ☐ don't know
6. What are the ages and sexes of your children?  

<u>Birthdate ( Day / Month / Year)</u>	<u>Sex</u>
_____	_____
_____	_____
_____	_____
7. Do you or any of your children suffer from a physical disability (i.e., deafness, blindness)? If yes, please indicate who has this disability and what the disability is: \_\_\_\_\_
8. Have you or your children attended special classes at school? If yes, please indicate who attended the class and why: \_\_\_\_\_

## Appendix W

Descriptive Statistics for Inaccuracy of EmotionRecognition for At-Risk and Control Mothers

Dependent Measures	Mean	At-Risk SD	% With No Error	Mean	Control SD	% With No Error
<u>Positive Emotions:</u>						
Interest1	1.50	2.07	57	0.57	1.21	72
Interest2	2.07	3.29	57	1.09	2.69	81
Joy1	0.14	0.54	93	0.29	1.23	89
Joy2	0.29	0.73	86	0.29	0.66	81
Surprise1*	2.93	2.79	29	3.11	2.41	25
Surprise2*	4.29	2.97	21	4.11	2.66	19
<u>Negative Emotions:</u>						
Anger1	2.93	2.89	36	2.43	2.30	30
Anger2	1.21	2.01	64	2.29	2.70	47
Pain1	1.21	2.19	64	1.23	2.09	64
Pain2	2.14	2.88	50	0.81	1.45	70
Sadness1*	3.21	2.12	07	3.72	2.42	09
Sadness2	1.14	2.18	64	0.29	0.88	87

Note. Values could range from 0 (least inaccuracy) to 8 (most inaccuracy).

\* These measures were removed from further analyses.

Appendix X

Descriptive Statistics for Intensity of Emotion

Recognition for At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
<u>Positive Emotions:</u>				
Interest1	5.36	1.99	6.55	2.16
Interest2	5.07	2.43	6.19	2.41
Joy1	6.93	1.39	7.44	1.69
Joy2	7.07	1.73	7.23	1.27
Surprise1*	4.79	2.67	4.81	2.62
Surprise2*	3.00	2.35	3.53	2.71
<u>Negative Emotions:</u>				
Anger1	4.93	2.46	5.19	2.42
Anger2	6.93	2.46	6.26	2.78
Pain1	6.36	2.02	7.17	2.20
Pain2	4.86	2.88	6.32	2.11
Sadness1*	2.79	2.52	3.02	2.08
Sadness2	5.86	2.25	7.64	1.45

Note. Values could range from 1 (emotion not at all present) to 9 (emotion very present).

\* These measures were removed from further analyses.

Appendix Y

Descriptive Statistics for Confidence Ratings

for At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
<u>Positive Emotions:</u>				
Interest1	7.29	1.14	7.87	1.29
Interest2	6.29	1.64	7.11	1.42
Joy1	7.21	1.85	7.85	1.27
Joy2	7.36	1.08	7.98	1.15
Surprise1*	7.50	0.86	7.51	1.76
Surprise2*	7.79	0.89	7.83	1.22
<u>Negative Emotions:</u>				
Anger1	7.27	1.07	7.11	1.67
Anger2	7.93	0.92	7.45	1.47
Pain1	7.50	1.23	7.41	1.61
Pain2	7.36	1.15	7.26	1.53
Sadness1*	6.29	1.44	7.17	1.48
Sadness2	7.14	1.09	7.55	1.12

Note. Values could range from 1 (not at all confident) to 9 (very confident).

\* These measures were removed from further analyses.

## Appendix Z

Descriptive Statistics for Attributions of Causality and  
Intentionality for At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
<u>Causality Ratings:</u>				
1. Negative-Yells <sup>a</sup>	2.57 <sup>b</sup>	1.22	2.75	1.17
2. Negative-Breaks Something*	2.21	1.31	2.21	1.18
3. Positive-Task Success*	2.57	0.76	2.47	1.14
4. Positive-Sharing	3.07	0.83	2.40	1.12
<u>Intentionality Ratings:</u>				
5. Negative-Yells	1.86 <sup>c</sup>	1.46	2.00	1.43
6. Negative-Breaks Something*	4.71	0.61	4.70	0.91
7. Positive-Task Success*	2.79	1.72	2.15	1.35
8. Positive-Sharing	2.21	1.31	1.59	1.04

<sup>a</sup> Categories refer to vignettes of infant behaviors.

<sup>b</sup> Values could range from 1 (internal attribution) to 5 (external attribution).

<sup>c</sup> Values could range from 1 (very intentional) to 5 (very unintentional).

\* These measures were removed from further analyses.

## Appendix AA

Descriptive Statistics for Reactions to Negative Infant  
Behaviors for At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
<u>Negative-</u>				
<u>Yells:<sup>a</sup></u>				
Yell	2.64 <sup>b</sup>	1.65	1.62	1.07
Praise	1.07	0.27	1.11	0.52
Do Nothing	1.79	1.19	2.53	1.69
Smile	1.79	1.37	2.00	1.33
Spank	2.00	1.36	1.26	0.79
Explain	3.93	0.92	3.40	1.72
Hug	3.43	1.45	3.59	1.61
Remove Child	2.43	1.39	3.17	1.75
Distraction	2.43	1.56	2.49	1.71
<u>Negative-</u>				
<u>Breaks Something:*</u>				
Yell	2.57	1.51	1.79	1.23
Praise	1.00	0.00	1.06	0.44
Do Nothing	1.86	1.41	2.36	1.61
Smile	1.79	1.05	1.59	1.04
Spank	2.86	1.75	1.23	0.52
Explain	4.21	0.80	4.06	1.44
Hug	2.64	1.69	1.77	1.22
Remove Child	1.50	0.86	1.57	1.14
Distraction	3.29	1.68	3.09	1.85

<sup>a</sup> Categories refer to vignettes of negative infant behaviors.

<sup>b</sup> Values could range from 1 (very unlikely) to 5 (very likely).

\* Reactions to this vignette were removed from further analyses.

## Appendix BB

Descriptive Statistics for Reactions to Positive Infant  
Behaviors for At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
<u>Positive-</u> <u>Task Success:</u> <sup>a</sup> *				
Yell	1.14 <sup>b</sup>	0.54	1.00	0.00
Praise	4.86	0.36	4.98	0.15
Do Nothing	2.00	1.47	1.47	1.12
Smile	4.86	0.36	4.92	0.28
Spank	1.00	0.00	1.00	0.00
Explain	1.14	0.54	1.04	0.29
Hug	4.50	1.16	4.51	1.06
Remove Child	1.07	0.27	1.00	0.00
Distraction	1.29	1.07	1.00	0.00
<u>Positive-</u> <u>Sharing:</u>				
Yell	1.29	1.07	1.00	0.00
Praise	4.50	1.09	4.68	0.94
Do Nothing	2.85	1.52	2.15	1.39
Smile	4.50	1.16	4.77	0.69
Spank	1.00	0.00	1.00	0.00
Explain	1.79	1.58	1.26	0.87
Hug	3.86	1.41	3.98	1.24
Remove Child	1.00	0.00	1.00	0.00
Distraction	1.29	1.07	1.15	0.63

<sup>a</sup> Categories refer to vignettes of positive infant behaviors.

<sup>b</sup> Values could range from 1 (very unlikely) to 5 (very likely).

\* Reactions to this vignette were removed from further analyses.

## Appendix CC

Descriptive Statistics for Measures from Emotion Rating  
Checklist for At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
Inaccuracy of Emotion Recognition <sup>a</sup>	1.55	1.43	1.27	0.96
Intensity of Emotion Recognition <sup>b</sup>	5.91	0.96	6.79	1.12
Confidence Ratings <sup>c</sup>	7.26	0.69	7.51	0.97

<sup>a</sup> Values could range from 0 (least inaccuracy) to 8 (most inaccuracy).

<sup>b</sup> Values could range from 1 (emotions not all at present) to 9 (emotions very present).

<sup>c</sup> Values could range from 1 (not at all confident) to 9 (very confident).



## Appendix DD

Descriptive Statistics for Attributions and Reactions for  
At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
<u>Attributional</u>				
<u>Ratings:</u> <sup>a</sup>				
Causality	-0.50	1.56	0.34	1.77
Intentionality	-0.36	1.87	0.40	1.86
<u>Reactions:</u> <sup>b</sup>				
Intrusion	1.54	1.18	1.20	0.68
Isolation	2.31	0.98	2.62	1.13
Nurturance	3.42	0.75	3.59	0.65
Punishment	2.32	1.17	1.44	0.71
Reasoning	3.93	0.92	3.40	1.72

<sup>a</sup> Values could range from -4 (negative bias) to 4 (positive bias).

<sup>b</sup> Values could range from 1 (very unlikely) to 5 (very likely).

Appendix EE

Descriptive Statistics for Depression and Empathy for  
At-Risk and Control Mothers

Dependent Measures	At-Risk		Control	
	Mean	SD	Mean	SD
Depression	22.21	12.69	11.28	7.56
<u>Interpersonal</u> <u>Reactivity</u> <u>Index:</u>				
Affective Empathy	22.79	3.02	22.87	3.82
Cognitive Empathy	18.14	5.79	18.00	4.80
Fantasy	18.86	5.22	17.98	5.66
Personal Distress	11.64	6.69	10.04	5.92

## Appendix FF

Pearson Product-Moment Correlation Matrix of Covariates  
with Measures of Emotion Recognition, Confidence Ratings,  
Attributions, and Reactions

Dependent Measures	Mother's Marital Status <sup>a</sup>	Mother's Education Level <sup>b</sup>	Socio-economic Status <sup>c</sup>
<u>Measures of Emotion Recognition:</u>			
Inaccuracy	-.08	-.14	.13
Intensity	.23*	.22*	-.13
<u>Confidence Ratings</u>	.21	.04	-.17
<u>Attributional Ratings:</u>			
Causality	-.12	.08	.01
Intentionality	-.02	.11	-.11
<u>Reactions:</u>			
Intrusion	-.07	-.33**	.22*
Isolation	-.03	.18	.09
Nurturance	-.12	.01	.12
Punishment	-.03	-.43***	.27*
Reasoning	-.08	-.06	.04

Note. All correlations are based on 61 subjects, except for confidence ratings, nurturance, and isolation for which data were missing for one subject.

<sup>a</sup> Values could be 1 (divorced/single) or 2 (married).

<sup>b</sup> Values could range from 1 (less than seventh grade) to 7 (graduate degree from university).

<sup>c</sup> Values could range from 1 (major business owner or professional) to 5 (unskilled laborer).

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

## Appendix GG

Pearson Product-Moment Correlation Matrix of Covariates  
with Depression and Empathy

Dependent Measures	Mother's Marital Status <sup>a</sup>	Mother's Education Level <sup>b</sup>	Socio- economic Status <sup>c</sup>
Depression	-.29*	-.36**	.48***
<u>Interpersonal Reactivity Index:</u>			
Affective Empathy	-.04	-.16	.13
Cognitive Empathy	-.15	.15	.01
Fantasy	-.13	-.09	.13
Personal Distress	.13	.02	.09

Note. All correlations are based on 61 subjects.

<sup>a</sup> Values could be 1 (divorced/single) or 2 (married).

<sup>b</sup> Values could range from 1 (less than seventh grade) to 7 (graduate degree from university).

<sup>c</sup> Values could range from 1 (major business owner or professional) to 5 (unskilled laborer).

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

## Appendix HH

MANCOVA for Measures from Emotion Rating Checklist and  
Interpersonal Reactivity Index

Effect	Dependent Variable	Univariate F	df
<u>Two Measures of Emotion Recognition and Confidence Rating:</u>			
Covariates	Inaccuracy	0.18	3,55
	Intensity	0.20	3,55
	Confidence	0.87	3,55
Group	Inaccuracy	0.01	1,55
	Intensity	2.55	1,55
	Confidence	0.00	1,55
<u>Interpersonal Reactivity Index:</u>			
Covariates	Affective Empathy	0.98	3,56
	Cognitive Empathy	1.46	3,56
	Fantasy	0.37	3,56
	Personal Distress	1.97	3,56
Group	Affective Empathy	1.19	1,56
	Cognitive Empathy	0.02	1,56
	Fantasy	0.09	1,56
	Personal Distress	3.26	1,56

## Appendix II

Comparison of Measures from Emotion Rating Checklist for  
the Four Sequences of Videotaped Segments of Infants'  
Facial Expressions

	Sequence 1 (N=16)		Sequence 2 (N=14)		Sequence 3 (N=16)		Sequence 4 (N=15)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Inaccuracy of Emotion Recognition <sup>a</sup>	1.24	0.84	1.25	1.19	1.44	0.92	1.41	1.41
Intensity of Emotion Recognition <sup>b</sup>	6.71	1.18	6.62	1.05	6.41	0.83	6.62	1.51
Confidence Ratings <sup>c</sup>	7.56	1.17	7.24	0.77	7.29	0.77	7.70	0.89

Note. Using multivariate analysis of variance, the Wilks' Lambda criterion indicated that measures from the Emotion Rating checklist were not significantly affected by the sequences of emotion segments,  $F(9,132) = 0.36$ ,  $p = .956$ .

<sup>a</sup> Values could range from 0 (least inaccuracy) to 8 (most inaccuracy).

<sup>b</sup> Values could range from 1 (emotions not all at present) to 9 (emotions very present).

<sup>c</sup> Values could range from 1 (not at all confident) to 9 (very confident).

## Appendix JJ

Comparison of Attributions and Reactions for the Four  
Sequences of Infant Vignettes

	Sequence 1 (N=15)		Sequence 2 (N=15)		Sequence 3 (N=15)		Sequence 4 (N=16)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<u>Attributional</u>								
<u>Ratings:</u> <sup>a</sup>								
Causality	0.33	1.88	0.13	1.64	-0.50	1.79	0.44	1.71
Intention- ality	0.07	1.44	-0.20	1.89	0.00	1.92	1.00	2.16
<u>Reactions:</u> <sup>b</sup>								
Intrusion	1.23	0.62	1.20	0.78	1.46	1.22	1.25	0.68
Isolation	2.88	1.06	2.36	1.19	2.38	0.70	2.60	1.36
Nurturance	3.50	0.61	3.69	0.64	3.39	0.84	3.59	0.66
Punishment	1.73	1.10	1.47	0.86	2.04	0.82	1.41	0.80
Reasoning	3.27	1.62	3.33	1.72	4.14	1.09	3.31	1.74

Note. Using multivariate analysis of variance, the Wilks' Lambda criterion indicated that attributional ratings and maternal reactions were not significantly affected by the sequences of vignettes,  $F(6,110) = 0.96$ ,  $p = .903$  for attributional ratings, and  $F(15,138) = 0.59$ ,  $p = .877$ , for maternal reactions.

<sup>a</sup> Values could range from -4 (negative bias) to 4 (positive bias).

<sup>b</sup> Values could range from 1 (very unlikely) to 5 (very likely).