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Young Children's Emotion Regulation and Social Skills: The Role of Maternal Emotional
Socialization and Mother-Child Interactional Synchrony

by

Holly N. Ambrose

A Dissertation
Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy
at the University of Windsor

Windsor, Ontario, Canada

2013

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Abstract

The present study examined parent-child interactional synchrony and parents' socialization of emotion as predictors of young children's social and emotional functioning. Participants were 136 children aged 3 to 6 years (80 males, 56 females) and their mothers. Mothers' reports of their typical reactions to their children's negative emotional expressions and of their children's emotion regulation and social skills were attained. Mother-child dyads engaged in a free play task and a structured teaching task that were coded for interactional synchrony. Results revealed that mothers' distress reactions to children's negative emotions predicted emotion regulation difficulties in children, while mothers' minimizing reactions predicted weaker prosocial skills (i.e., cooperation, assertion, responsibility, and self-control) in children. Mothers' expressive encouragement reactions predicted children's cooperation and assertion skills. Children with fewer emotion regulation difficulties exhibited greater cooperation, assertion, responsibility, and self-control skills. Children's emotion regulation skills mediated the link between mothers' personal distress reactions to children's negative emotions and children's cooperation, assertion, responsibility, and self-control skills. Higher levels of synchrony in the mother-child interaction directly predicted greater assertion skills in children. Three indirect effect models clarified links between interactional synchrony and child outcomes. Lower levels of interactional synchrony during the free play task were associated with mothers' tendency to react to their children's negative emotions with personal distress, and in turn, these children exhibited greater emotion regulation difficulties. Lower levels of interactional synchrony during the free play and structured block tasks were both associated with mothers' tendency to use minimizing reactions to their children's negative emotions, and in turn, these children exhibited fewer social

skills. Moderation models examining the link between maternal emotion socialization behavior, the quality of the mother-child relationship, and children emotion regulation and social skills were not supported. The findings help clarify the role of parent-child interactions in children's development of emotional and social competence, providing useful information for the development of intervention and prevention programs.

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TABLE OF CONTENTS

| | |
|--|-----|
| DECLARATION OF ORIGINALITY..... | iii |
| ABSTRACT..... | iv |
| ACKNOWLEDGEMENTS..... | vi |
| LIST OF TABLES..... | ix |
| LIST OF FIGURES..... | xi |
| | |
| CHAPTER I: INTRODUCTION..... | 1 |
| Study Context and Purpose..... | 1 |
| Literature Review..... | 6 |
| Emotional and Social Competence..... | 6 |
| Maternal Emotion Socialization..... | 8 |
| Emotion Related Parenting Practices..... | 9 |
| Maternal Expressiveness..... | 9 |
| Maternal Discussion of Emotion..... | 12 |
| Mothers' Reactions to Children's Negative Emotions..... | 14 |
| Links between Maternal Reactions to Children's Negative Emotions and Children's Emotion Regulation Skills..... | 23 |
| Links between Maternal Reactions to Children's Negative Emotions and Children's Social Skills..... | 30 |
| Links between Children's Emotion Regulation and Social Skills..... | 34 |
| Emotion Regulation as a Mediator of the Association between Maternal Reactions to Children's Negative Emotions and Children's Social Skills..... | 39 |
| Links between the Quality of the Parent-Child Relationship, Maternal Emotion Socialization, and Children's Emotion Regulation and Social Skills..... | 42 |
| Interactional Synchrony..... | 46 |
| Study Purpose and Objectives..... | 53 |
| Study Hypotheses..... | 57 |
| | |
| CHAPTER II: METHOD..... | 60 |
| Participants..... | 60 |
| Measures..... | 61 |
| Cognitive Ability..... | 61 |
| Background Information..... | 65 |
| Maternal Emotion Socialization..... | 65 |
| Children's Emotion Regulation..... | 66 |
| Children's Social Skills..... | 68 |
| Mother-Child Interactional Synchrony..... | 70 |
| Procedure..... | 75 |
| | |
| CHAPTER II: RESULTS..... | 77 |
| Planned Analyses..... | 77 |
| Data Screening and Preparation..... | 78 |
| Preliminary Analyses..... | 82 |
| Main Analyses: Examination of Direct Effect Models..... | 87 |

| | |
|---|------------|
| Hypothesis #1: Associations between maternal reactions to children's negative emotions and children's emotion regulation skills..... | 89 |
| Hypothesis #2: Associations between maternal reactions to children's negative emotions and children's social skills..... | 91 |
| Hypothesis #3: Associations between children's emotion regulation and social skills..... | 101 |
| Main Analyses: Examination of Mediation and Moderation Models..... | 103 |
| Hypothesis #4: Investigating the mediating effect of emotion regulation on the relation between maternal reactions to children's negative emotions and children's social skills..... | 103 |
| Hypothesis #5: Investigating the relations between interactional synchrony, maternal reactions to children's negative emotions, and children's emotion regulation and social skills..... | 108 |
| Hypothesis 5a: Investigating the mediating effect of maternal reactions to children's negative emotions on the link between interactional synchrony and children's emotions regulation and social skills..... | 108 |
| Hypothesis 5b: Investigating the moderating effect of interactional synchrony on the link between maternal reactions to children's negative emotions and children's emotions regulation and social skills... | 117 |
| Summary of Results..... | 124 |
| CHAPTER IV: DISCUSSION..... | 127 |
| Maternal Reactions to Children's Negative Emotions and Children's Emotion Regulation Skills..... | 127 |
| Maternal Reactions to Children's Negative Emotions and Children's Social Skills..... | 134 |
| Children's Emotion Regulation and Social Skills..... | 137 |
| Emotion Regulation as a Mediator of the Association between Maternal Reactions to Children's Emotions and Children's Social Skills..... | 139 |
| Quality of the Parent-Child Relationship, Maternal Emotion Socialization, and Children's Emotion Regulation and Social Skills..... | 140 |
| Interactional Synchrony..... | 140 |
| Models of Interactional Synchrony..... | 143 |
| Demographic Factors..... | 147 |
| Child age..... | 147 |
| Child gender..... | 148 |
| Socio-economic status..... | 149 |
| Study Limitations..... | 151 |
| Directions for Future Research..... | 154 |
| Applied Implications..... | 157 |
| REFERENCES..... | 162 |
| APPENDIX A: Demographics Questionnaire..... | 181 |
| APPENDIX B: Corresponding Items between the BRIEF and BRIEF-P..... | 187 |
| VITA AUCTORIS..... | 188 |

LIST OF TABLES

| TABLE | PAGE |
|-------|--|
| 1 | Demographic Characteristics of Sample 62 |
| 2 | Summary of Study Variables and Measures 74 |
| 3 | Mean, Standard Deviation, and Range of Variables for the Total Sample 83 |
| 4 | Correlations Between Study Variables and Demographic Characteristics 84 |
| 5 | Inter-correlations between Independent and Dependent Variables 88 |
| 6 | Summary of the Hierarchical Regression Analysis for Predicting BRIEF Emotional Control with CCNES Personal Distress Reactions 90 |
| 7 | Summary of the Hierarchical Regression Analysis for Predicting BRIEF Emotional Control with CCNES Punitive Reactions 92 |
| 8 | Summary of the Hierarchical Regression Analysis for Predicting SSRS Total Social Skills Composite with CCNES Minimizing Reactions 94 |
| 9 | Summary of the Hierarchical Regression Analysis for Predicting SSRS Cooperation Skills with CCNES Punitive Reactions 96 |
| 10 | Summary of the Hierarchical Regression Analysis for Predicting SSRS Assertion Skills with CCNES Punitive Reactions 97 |
| 11 | Summary of the Hierarchical Regression Analysis for Predicting SSRS Cooperation with CCNES Expressive Encouragement Reactions 99 |
| 12 | Summary of the Hierarchical Regression Analysis for Predicting SSRS Assertion with CCNES Expressive Encouragement Reactions 100 |
| 13 | Summary of the Hierarchical Regression Analysis for Predicting SSRS Self-Control with CCNES Problem-Focused Reactions 102 |
| 14 | Summary of the Hierarchical Regression Analysis for Predicting SSRS Total Social Skills Composite with BRIEF Emotional Control 104 |
| 15 | Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Minimizing Reactions and SSRS Total Social Skills Composite 120 |

| | | |
|----|--|-----|
| 16 | Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Personal Distress Reactions and Children's Emotion Regulation | 122 |
| 17 | Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Mothers' Expressive Encouragement Reactions and Children's Assertion Skills | 123 |
| 18 | Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Mothers' Expressive Encouragement Reactions and Children's Cooperation Skills | 125 |

LIST OF FIGURES

| FIGURE | | PAGE |
|--------|---|------|
| 1 | Theorized Relations between Variables of Interest | 4 |
| 2 | Proposed Relations between Maternal Reactions to Children's Negative Emotions, Children's Emotion Regulation Skills, Children's Social Skills, and the Quality of the Mother-Child Relationship | 55 |
| 3 | Mediation model depicting relations between variables | 105 |
| 4 | Hypothesis 4 mediation model depicting relations between maternal reactions to children's negative emotions, children's emotion regulation skills, and children's social skills | 107 |
| 5 | Hypothesized mediation model in which maternal reactions to children's negative emotions mediates the link between interactional synchrony and child outcome measures | 110 |
| 6a | Hypothesis 5a mediation models for interactional synchrony during free play | 112 |
| 6b | Hypothesis 5a mediation models for interactional synchrony during the structured block task | 113 |
| 7 | Moderation models tested in Hypothesis 5b | 119 |

CHAPTER I

Introduction

Study Context and Purpose

Given the chance to observe any group of children, one would see several children playing happily with friends, sharing toys, reading others' emotions and reacting in socially adaptive ways, and reacting to distress by effectively problem-solving, self-soothing, or searching for a trusted adult to help. However, a handful of children in the group would be seen defying adults, using aggression to solve peer conflicts, misreading others' emotions and reacting inappropriately, and reacting to their own distress with intense emotional displays. The question on the minds of many parents, teachers, mental health professionals, and researchers, is why do these children differ so dramatically? Why do some children understand what leads to different emotions and how to reduce emotional upset, whereas others seem unable to control their emotions in adaptive ways? Why do some children make friends easily, get along with important adults, and know how to keep the friends they have made, whereas others do not know how to approach potential new friends, react poorly to adults' directions, and react to conflict with maladaptive responses and intense emotional displays? Collectively, we want to know how children develop emotional control and social skills.

Differences in emotional control and social skills appear to partially reflect differences in longstanding intrapersonal qualities, such as temperament (Bates & Pettit, 2007; Rothbart & Sheese, 2007), but parenting characteristics also have emerged as indicators of how children develop emotional and social competence (e.g., Denham & Grout, 1993; McCutcheon, 2005; McDowell, Kim, O'Neil, & Parke, 2002; Shields, 1996). Several theorists have highlighted the important impact of emotion-related

parenting behaviours and beliefs on children's development of social and emotional competence (e.g., Denham & Grout, 1993; Denham & Kochanoff, 2002; Eisenberg, Cumberland, & Spinrad, 1998a). The present study explored these relations, with an emphasis on several facets of the parent-child relationship as a predictor of children's emotional and social competence.

Emotion socialization is the process through which children develop emotion-related beliefs, values, and expressive behaviours through their interactions with others (Saarni, 1999). Several parental behaviours have been shown to affect children's emotion socialization, including the ways that parents react to their children's displays of negative emotions (Denham & Grout, 1993). For example, children whose parents react to their negative emotions (e.g., fear, anger, sadness, disappointment) in a supportive manner (e.g., by comforting them or helping them problem-solve) tend to be better at coping with negative emotions (Cole, Dennis, Smith-Simon, & Cohen, 2009; Eisenberg, Fabes, & Murphy, 1996), whereas children whose parents react in an unsupportive way (e.g., by punishing them or minimizing the trigger of their distress) tend to have more difficulty regulating their emotions (Lunkenheimer et al., 2007). Research also has shown that children who have poor emotion regulation skills tend to have poorer social skills (McDowell, Kim, O'Neil, & Parke, 2002). The present study extends these previous research findings by examining the link between maternal reactions to children's negative emotions and children's emotion regulation and social skill development, while also examining the effect of the quality of the mother-child relationship on these links.

Eisenberg and colleagues (1998b) proposed a model of the links between parental emotion socialization (i.e., emotion-related parenting practices) and child outcomes. The components of Eisenberg and colleagues' model that are examined in this study are

presented in Figure 1. Parental reactions to children's negative emotions have been shown to predict children's emotion regulation skills (Cole et al., 2009; Eisenberg et al., 1996; Lunkenheimer et al., 2007) and children's social skills (McDowell et al., 2002). Children's emotion regulation skills also have been shown to mediate the relation between parental reactions to children's negative emotions and children's social skills (Davidov & Grusec, 2006; Eisenberg et al., 1999; Gottman, Katz, & Hooven, 1996). Parenting styles and other aspects of the parent-child relationship have been theorized to moderate the link between parental reactions to children's negative emotions and children's social and emotional competence (Cassidy, 1994; Thompson, 1994), but to the author's knowledge, research has not yet been completed to support this theory. The purpose of the present study was to add to the emotion socialization literature by examining the role of the quality of the mother-child relationship in this model.

This study aimed to increase understanding of how preschool-aged children develop social and emotional competence and the role of the parent-child relationship in this process. During the preschool years children learn the skills that are used to help them express, moderate, and manage their own emotions and that are needed to know how to respond to situations that involve emotions (Saarni, 1997). They build on their previous knowledge about emotional expressions, learn to acknowledge that others' emotions differ from their own, start to be able to accurately identify causes and consequences of emotions, begin to consider more complex aspects of emotions such as mixed emotions and display rules for different emotions, and begin to understand emotion regulation (Denham & Couchoud, 1990; Denham & Kochanoff, 2002). It is believed that the preschool age period is the opportune time to examine how children learn about

Figure 1. Theorized Relations between Variables of Interest

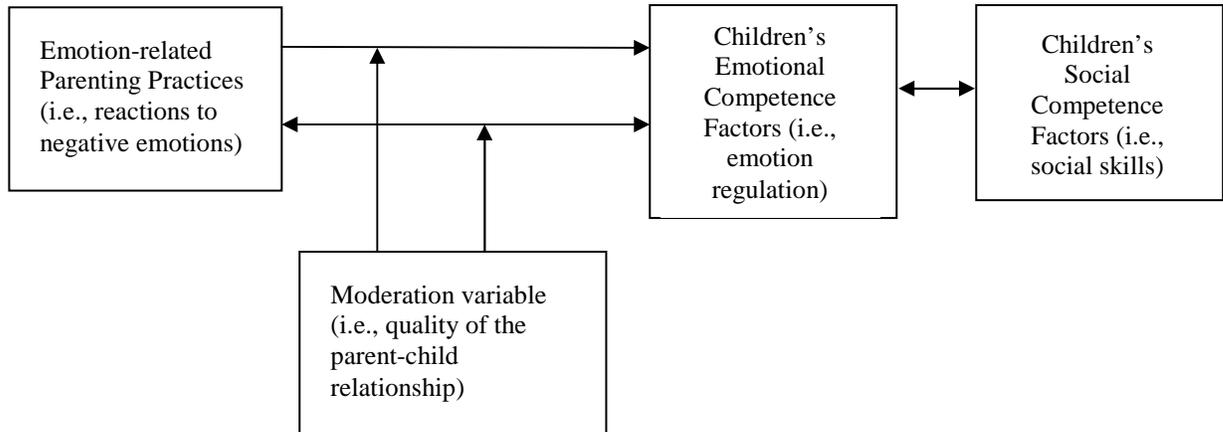


Figure 1. Prediction, mediation, and moderation models theorized by Eisenberg et al. (1998b) that are examined in this study. Adapted from “The socialization of emotion: Reply to commentaries,” by N. Eisenberg, A. Cumberland, and T. L. Spinrad, 1998b, *Psychological Inquiry*, 9, p. 320. Reprinted by permission of the publisher (Taylor & Francis Ltd, <http://www.tandf.co.uk/journals>).

emotions (Denham & Kochanoff, 2002) because they observe their social world very carefully in an effort to understand it (Miller & Aloise, 1989). In particular, it is a good age to examine the role of mothers in the emotion socialization process due to the high degree of contact between children and their mothers at this age. During the preschool years children spend a large proportion of their time with their mothers and they are in a developmental stage that is characterized by watching, listening, and imitating their mothers while they learn about the world (Denham & Kochanoff, 2002). Unfortunately, despite the appeal of studies with preschool-aged children in this area, a thorough understanding of mothers' roles in the emotion socialization process for preschoolers has yet to be achieved (Denham & Kochanoff, 2002).

The literature review for this study begins by presenting definitions for social and emotional competence. Next, the process of maternal emotion socialization will be described in detail and models of this process will be reviewed. The most commonly theorized modes of maternal emotion socialization, including maternal expressivity, maternal discussion of emotions, and mothers' reactions to children's negative emotions, as well as the research supporting these theories, will be reviewed. Past research and theories regarding how mothers' reactions to children's negative emotions play a role in children's development of emotion regulation and specific social skills will then be reviewed. This review will be followed by a summary of research that has examined the link between children's emotion regulation and social skills. Emotion regulation is then proposed as a mediator of the link between parental reactions to children's emotions and children's social skills, and relevant research is reviewed. Next, research and theories regarding the quality of the parent-child relationship as a factor that affects several aspects of the emotion-socialization process will be reviewed. A construct called

interactional synchrony will be introduced and will be discussed as a way of measuring the quality of the parent-child relationship. Finally, the objectives and hypotheses of the present study will be presented.

Literature Review

Emotional and Social Competence

Emotional competence refers to the ability to display emotions in a socially, culturally, and situationally acceptable manner, to understand one's own and others' emotions, and to inhibit the experience and expression of emotion when necessary to achieve personal goals in a socially acceptable manner (Denham & Grout, 1993; Eisenberg et al., 1998a). Saarni (1999) has proposed that parental emotion socialization affects children's expression of emotion through cultural and societal expectations and norms; children learn guidelines and rules for when, where, and to which people they should express different emotions. Beliefs about which emotional expressions are socially acceptable or desirable are called display rules; within each culture and society there is considerable consensus for when and how expressions of different emotions should occur (Saarni, 1999). Saarni suggests that children learn these display rules through the process of parental emotion socialization. Understanding one's own and others' emotions also develops as a result of the parental emotion socialization process. This process involves reflection on one's own emotional experience as well as the ability to infer others' emotional states based on their emotional expressions (Saarni, 1999). The ability to infer others' emotional states is a crucial skill that helps children effectively initiate and maintain social relationships (Denham et al., 2003).

Emotion regulation is an important component of emotional competence.

Emotion regulation is defined as the ability to monitor, evaluate, and modify one's own

emotional experience or emotional expression in accordance with the demands of the current social environment (Thompson, 1994). Emotion regulation involves the ability to alter the intensity, escalation (e.g., latency and time to rise), and duration of an emotional response (Thompson, 1994). Emotion regulation is used to alter these emotional responses in a way that fits the individual's goals for the social situation they are in (Thompson, 1990). That is, effective emotion regulation requires the ability to understand display rules and to make decisions regarding when and where to express specific emotions, as well as the ability to identify and effectively implement strategies for increasing or decreasing emotional arousal (Thompson, 1994). These skills are all required to demonstrate emotional competence, and they are all believed to be acquired through parental emotion socialization (McDowell, Kim, O'Neil, & Parke, 2002). In sum, emotional competence involves the understanding of society's display rules, an ability to understand one's own and others' emotional experiences, and the development of the skills that are necessary to regulate one's own emotions. Each of these skills is believed to play a part in the development of social competence.

Children who understand others' emotions and who can identify their own emotions and regulate them in a way that is socially acceptable are more likely to be able to engage in successful social interactions with others (Denham et al., 2003). Social competence is defined as the skills that help children engage in successful social interactions, such as social skills, prosocial behaviours, social play behaviour, and socially appropriate behaviour (Trentacosta & Fine, 2010). Four types of social skills are believed to strongly affect children's degree of peer acceptance, ability to form positive relationships with teachers and other important adults, and ability to make friends: cooperation, assertion, responsibility, and self-control (Gresham & Elliot, 1990). These

four types of social skills are also valued and commonly rewarded in Western societies (Gresham & Elliot, 1990). As such, they were a focus of the present study. Cooperation skills include behaviours such as helping others, complying with rules and directions, and sharing (Gresham & Elliot, 1990). Assertion skills include initiating behaviours, such as introducing oneself, asking others for information, and responding to others' actions (Gresham & Elliot, 1990). Responsibility skills include behaviours that show the children's ability to communicate with adults and show respect toward property, such as asking permission before using another family member's property (Gresham & Elliot, 1990). Self-control skills include behaviours that could occur in conflict situations, such as responding appropriately to teasing, as well as behaviours that could occur in non-conflict situations that require compromising and taking turns (Gresham & Elliot, 1990).

Maternal Emotion Socialization

Maternal emotion socialization is the process through which maternal "practices and behaviours influence a child's learning regarding the experience, expression, and regulation of emotion and emotion-related behaviour (e.g., expressivity)" (Eisenberg et al., 2001, p. 183). During this process, children develop emotion-related beliefs, values, and skills for experiencing and regulating their emotions (Saarni, 1999). That is, emotion socialization is one process through which children can develop emotional competence. All individuals who interact with children communicate messages about their emotion-related beliefs and values, and these messages shape the socialization of children's emotions (Saarni, 1999). However, parents are believed to be the primary socializers of children's emotions (Grusec & Davidov, 2007; Thompson & Meyer, 2007).

Eisenberg and colleagues (1998b) developed a model of emotion socialization that outlines the pathways through which parental emotion socialization occurs, how it can

affect children's development, and factors that can affect each pathway. Eisenberg and colleagues (1998b) identified three emotion related parenting practices through which parental emotion socialization occurs: parents' emotional expressiveness, parents' discussion of emotions with their children, and parents' reactions to children's negative emotions. They postulated that these parenting practices affect children's development of emotional competence. They also suggest that children's emotional competence has a bidirectional effect on children's social competence.

In addition, Eisenberg and colleagues (1998b) proposed a number of factors that may interact with parents' emotion-related parenting practices to affect children's social and emotional competence (i.e., moderators of the pathways). These factors are parenting style, quality of the parent-child relationship, type and intensity of the child's and parent's emotions, appropriateness of the parent's emotions and behaviours within their context, child's temperament and personality, child's developmental level, child's gender, variability and consistency of the parent's behaviour, clarity of parental communication, the fit between the parental behaviour and the child's developmental level, whether the parental behaviour is directed at the child, and whether the parental behaviour is proactive or reactive. It is beyond the scope of this study to examine each of these factors. The present study examined emotion-related parenting practices, children's emotional competence, children's social competence, and the quality of the parent-child relationship.

Emotion-Related Parenting Practices

Maternal expressiveness. Maternal expressiveness refers to mothers' tendencies to express emotions through verbal and nonverbal expressions in front of their children (Eisenberg et al., 2001). These expressions do not only occur during interactions with the

child; they can occur in situations in which the child is not directly involved, and they can involve expressions that are not directed at the child (Eisenberg et al., 2001). It is believed that mothers' expressiveness of their own emotions affects children's emotion socialization in multiple ways. First, the way mothers express their own emotions can affect the way children express their emotions through direct processes such as imitation and contagion (Denham & Grout, 1993). Second, maternal expressiveness of emotion may be a correlate of other maternal behaviours that affect emotion socialization. For example, mothers who value the expression of emotion tend to be more expressive, and it is possible that they are reinforcing their children's expressivity through their own expressivity or through their philosophy about emotions (Eisenberg et al., 1998a).

Third, maternal expressiveness may influence how effectively children are able to interpret and understand others' emotional reactions (Eisenberg et al., 1998a). When mothers express emotions they provide children with information about the emotional significance of events, others' reactions to emotions, and behaviours that tend to occur during certain emotions (Eisenberg et al., 1998a). In addition, mothers' expression of their own emotions serves to expose children to a range of emotions. These factors are all thought to help children learn to interpret others' emotional expressions accurately (Eisenberg et al., 1998a).

Finally, maternal expressions of emotion may influence children's emotion socialization by shaping their thoughts and feelings about themselves, others, and the social world (Eisenberg et al., 1998a). The way mothers deal with their own emotions influences whether children think of emotions as threatening, something that needs to be controlled, something that prevents or harms rational thinking, or as something that is to be enjoyed and that can enhance relationships (Dunsmore & Halberstadt, 1997). That is,

maternal emotional expressivity affects children's development of schemas about emotional expression and the experience of emotion (Dunsmore & Halberstadt, 1997).

Research has supported these theories. In a review of 77 studies examining the degree to which families openly express emotions, Halberstadt, Crisp, and Eaton (1999) concluded that family expressiveness is linked to children's social and emotional development; families who expressed greater degrees of positive emotions (e.g., happiness, pride, excitement) tended to have children with better developed emotion regulation skills. The links between the degree to which families openly express negative emotions (e.g., fear, anger, sadness) and children's emotion regulation skills are less clear. Halberstadt and colleagues' review suggested that kindergarten-aged children in families with more negative expressiveness had more developed emotion regulation skills, but toddlers, college students, and adults in families with high levels of negative emotionality had poorer emotion regulation skills. The link between emotion knowledge and family expressiveness is also varied. Children whose mothers are more emotionally expressive have a greater understanding of emotions in others, are better at labelling emotions, have greater emotion situation knowledge, and have better perspective-taking skills. However, studies of college students revealed that those who described their mothers as being more expressive had fewer emotion labelling and perspective-taking skills than those who described their mothers as less expressive. This pattern was especially clear for maternal expressiveness of negative emotions. Overall, the studies revealed that positive family expressiveness was associated with children's greater understanding of emotion and that mild to moderate negative family expressiveness was linked with children's greater understanding of emotions, but that intense maternal

displays of negative emotions were linked with lower levels of emotion knowledge in children.

Halberstadt and colleagues' (1999) review also revealed links between family expressiveness and children's social competence. These studies revealed that higher levels of positive family expressiveness are associated with higher levels of social competence, including higher levels of social skills, prosocial behaviours, non-aggressiveness, non-disruptiveness, sociable behaviours, and being liked by peers. In contrast, families with highly negative expressiveness had children with poor outcomes in these areas of social competence. However, family expressions of mild to moderate negative emotions appeared to help children develop socially competent behaviours through practice with their upset parents.

Maternal discussion of emotion. The way that mothers talk about emotion within the family also affects children's development of social and emotional competence (Eisenberg et al., 1998a). Mothers send their children messages about emotions during everyday conversations; for example, they may emphasize some emotions and avoid talking about others, they may explain the common causes and consequences of emotions, and they may help children understand their experiences of emotion through discussion (Eisenberg et al., 1998a). It is believed that children who are raised by mothers who encourage conversations about the experience of emotions are able to communicate their emotions better and understand others' emotions more easily, suggesting that they are more likely to have better developed emotional and social competence (Eisenberg et al., 1998a). Brown and Dunn (1996) tested these theories in a longitudinal study that followed 47 children from age 3 to 6 years. They found that children who engaged in discussions of emotions with their parents tended to have a better understanding of

emotions. Specifically, these researchers noted that children whose parents engaged them in discussions of how emotions impact people's behaviour were better able to recognize and understand basic emotions. In contrast, it is believed that children of mothers who do not openly and freely discuss emotions, especially negative emotions, do not receive information about emotions and the regulation of emotions and as a result may believe that emotions should not be expressed (Eisenberg et al., 1998a). As a result, these children are less likely to develop the skills necessary for emotional and social competence.

Gottman, Katz, and Hooven (1997) developed a construct called emotion coaching, which not only includes the tendency to discuss emotion with children, but also examines the quality of the communication. Gottman and colleagues conceptualize emotion coaching as requiring parents to engage in several skills: recognizing the child's emotion, viewing the child's expression of emotion as an optimal time for teaching and intimacy to occur, helping the child to verbally label the experienced emotion, empathizing or validating the child's emotions, talking to the child about emotions, teaching children socially acceptable and appropriate rules for expressing emotions, educating children about the nature of emotions, and teaching children strategies for dealing with emotions, such as how to reduce the intensity of unpleasant emotions using techniques like problem-solving. Research has supported the idea that maternal emotion coaching enhances children's ability to inhibit negative emotions, to self-soothe, and to regulate their emotions (Gottman et al., 1997).

Other aspects of the conversational quality have also been found to affect the impact of maternal discussion of emotions on children's emotion socialization. Namely, the appropriateness and quality of the communication between the mother and child

appear to influence the impact of these discussions on the child (Eisenberg et al., 1998a). For example, the clarity, consistency, directness, and relevance of the message, cues sent about the importance of the message, and whether the child's attention is focused on the message are all believed to impact how effective the maternal communication will be in helping the child to develop emotional and social competence (Eisenberg et al., 1998a).

Mothers' reactions to children's negative emotions. Maternal reactions to children's displays of negative emotions are thought to be an excellent and clear example of how mothers can directly socialize their children's emotional reactions (Eisenberg et al., 1998a). Children express positive (e.g., happiness, love, pride) and negative emotions (e.g., anger, fear, sadness) during their interactions with their parents through facial expressions, behaviours, and verbal indicators. It has been theorized that the way in which mothers react to these emotional expressions, and specifically how they react to negative emotional expressions, is one of the main processes of emotional socialization that occurs within the mother-child relationship (Eisenberg et al., 1998a; Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002). Researchers in the field have focused primarily on maternal reactions to children's negative emotions because it is through the socialization of negative emotions that children learn to cope with their own and others' negative emotional states (Fabes et al., 2002).

Maternal reactions to negative emotions have been classified into two categories: supportive and unsupportive reactions (Eisenberg et al., 1998a; Fabes et al., 2002). Supportive reactions are those that are comforting for the child, teach the child constructive coping techniques, or encourage emotional expression (Eisenberg et al., 1998a; Fabes et al., 2002). Unsupportive reactions are those that are not comforting and may make the negative emotion even stronger, do not teach the child how to cope with

their emotions, and punish or ignore the child's emotional expression (Eisenberg et al., 1998a; Fabes et al., 2002). Those that are considered supportive have been empirically linked to emotional and social competence, whereas those that have been classified as unsupportive have been linked to difficulties in these areas (Eisenberg et al., 1998a).

Negative emotions are often thought of as aversive. Mothers may interpret children's expressions of negative emotions as techniques to manipulate others, as indicators of poor character, or as something that is harmful for children to experience (Fabes et al., 2002). As a result, mothers may be motivated to react to expressions of negative emotion using negative control strategies (Fabes et al., 2002). Indeed, recent research has discovered that parents' emotion socialization behaviours, including their reactions to children's negative emotions, are predicted by their personal beliefs and attitudes about negative emotions (Baker, Fenning, & Crnic, 2011; Wong, McElwain, & Halberstadt, 2009). Specifically, parents who have more accepting beliefs about children's negative emotions exhibit fewer unsupportive reactions to these emotions (Wong et al., 2009). Gottman (1997) suggested that mothers who experience their children's negative emotions as aversive tend to react to them by punishing the children or by trivializing the negative emotion in an attempt to quickly end the expression of the negative emotion. These two types of reactions are traditionally classified as unsupportive reactions (e.g., Fabes et al., 2002). Minimizing reactions are those in which mothers discount the seriousness of children's negative emotional reactions, devalue their distress response, or devalue their emotion-inducing problem (Fabes et al., 2002). Thus, minimizing reactions are a more subtle way for mothers to attempt to limit or restrict children's negative emotional expressions (Fabes et al., 2002). The more overt type of the unsupportive reactions, called punitive reactions, represent occasions when the mother

uses physical or verbal punishment to control or limit the child's negative emotion expressions (Fabes et al., 2002).

A third type of unsupportive maternal reaction to children's negative emotions also has been identified. This unsupportive reaction occurs when a mother becomes emotionally distressed when her child expresses negative emotions (Eisenberg et al., 1998a; Fabes et al., 2002). For example, these mothers may feel upset by, or uncomfortable with, their children's negative emotions and as a result they tend to focus on their own discomfort rather than on the needs of their children (Fabes, Leonard, Kupanoff, & Martin, 2001). As a result, these mothers try to reduce their own emotional distress by avoiding their upset children or by using one of the other two unsupportive reactions to attempt to control the children's negative emotion expressions (Eisenberg et al., 1998a; Fabes et al., 2002). Buck (1984) suggested that these mothers are rewarded with relief from the children's negative emotional expressions, but the cost of this relief is that the children learn to suppress their negative emotions until they reach a point when they are released in an intense and dysregulated manner. That is, the children whose mothers respond in this manner tend to have lower social and emotional competence as a result (Fabes et al., 2002).

There are several theories as to how unsupportive maternal reactions affect emotion socialization, including the development of social and emotional competence. Buck (1984) theorized that children whose negative emotional expressions are controlled and limited by their mothers through these unsupportive reactions learn to hide their negative emotions, but that while they suppress their negative emotional expressions in emotion-evoking contexts, they experience stronger physiological reactivity. Buck explained that when these children are repeatedly exposed to punishing or minimizing

reactions while they experience negative emotions, they learn to feel anxious when they are in situations that evoke negative emotions. Roberts and Strayer (1987) theorized that when children repeatedly experience maternal suppression of their negative emotions, they store the negative emotions as well as the maladaptive responses in their memory; as a result, when they are in similar emotion-evoking situations, the children retrieve both the negative affective experience and the inappropriate behavioural responses from their memory. Eisenberg, Fabes, and Murphy (1996) theorized that unsupportive reactions heighten and extend the duration of children's negative arousal, and as a result, the children are more likely to engage in dysregulated behaviour. In addition, it is believed that children who learn to view their own and others' negative emotions as threatening due to unsupportive maternal reactions are likely to avoid exploring the meaning of emotions and ways to cope with them (Eisenberg et al., 1998a). Each of these theories represent pathways through which unsupportive maternal reactions to children's negative emotions can affect children's emotional and social competence.

Research that has been done in this area has supported these theories; each of the unsupportive maternal reactions discussed thus far have been linked to negative child outcomes. Specifically, unsupportive maternal reactions have been linked to lower levels of emotional and social competence in children. For example, Eisenberg and colleagues (1996) investigated the impact of minimizing and punishing reactions on third and sixth graders' social and empathic responsiveness. They assessed parental reactions to children's negative emotions using parents' responses on the Coping with Children's Negative Emotions Scale (Fabes, Eisenberg, & Bernzweig, 1990). Children's coping skills were measured using the Children's Coping Strategies Checklist (Ayers, Sandler, West, & Roosa, 1990), which was completed by the children's mothers and teachers.

Children's empathic and social responsiveness was assessed by observing their responses to what they thought was a baby crying in an adjacent room. Using a sample of 148 boys and girls, they found that children whose parents used minimizing and punishing reactions had lower levels of empathic and social responsiveness.

Lukenheimer, Shields, and Cortina (2007) examined the effect of emotion-dismissing parental reactions on a sample of 87 8- to 11-year-old boys' and girls' problem behaviours, which are indicators of poor social competence. They defined parental emotion-dismissing as a belief that negative emotions are toxic or overwhelming, a desire to protect themselves and their children from negative emotions, and the tendency to invalidate or criticize their children's emotions. These researchers measured parental reactions during a family discussion task and gathered information on the children's problem behaviours using the mother, father, and teacher reports of the Child Behaviour Checklist (Achenbach & Rescorla, 2000, 2001). They found that children whose parents engaged in emotion-dismissing behaviours engaged in more behavioural problems.

Denham, Mitchell-Copeland, Strandberg, Auerbach, and Blair (1997) studied punitive reactions to children's negative emotions in 60 mother, father, and preschool-aged child triads. They examined the link between parents' punitive reactions and children's emotion knowledge. They assessed parental reactions to negative emotions by counting the frequency of a variety of possible reactions during home visit parent-child interaction tasks. They assessed the children's emotion knowledge using a task in which children were asked to choose the facial expression that a faceless puppet should have after a series of stories as well as through a more open-ended interview using a puppet with fixed faces. In this study, emotion knowledge included nonverbal recognition, verbal labelling, identification of which emotions are appropriate for different situations,

and inferences of emotions in equivocal situations. Denham and colleagues found that children whose parents used punitive reactions when they expressed negative emotions tended to have lower levels of emotion knowledge.

Perlman, Camras, and Pelphrey (2008) also discovered a link between unsupportive parental reactions to children's negative emotions and children's emotion knowledge using a sample of 44 preschool-aged children (4-5 years) and their primary caregivers (40 mothers, 3 fathers, 1 grandmother). Parental reactions to children's negative emotions were assessed using the Coping with Children's Negative Emotions Scale (Fabes et al., 1990), and they combined minimizing, personal distress, and punitive reactions into a global unsupportive reaction variable. Children's emotion knowledge was assessed by asking them to match emotional facial expressions with their corresponding emotion word (e.g., which faces shows "happy"?). Children whose parents used unsupportive reactions when they expressed negative emotions were more likely to exhibit poor emotion knowledge.

Fabes and colleagues (2001) investigated minimizing and punishing parental reactions in a sample of 57 parent-child dyads. The male and female children ranged in age from 40 to 77 months old. Parental reactions to children's negative emotions were assessed using the Coping with Children's Negative Emotions Scale (Fabes et al., 1990). Children's empathic and social responsiveness were measured using a teacher-report version of the Social Competence Scale for Children (Harter, 1979) that was adapted for use on a preschool-aged sample. The researchers found that children whose parents engaged in minimizing and punishing reactions when they expressed negative emotions had lower levels of empathic and social responsiveness.

Studies have also found an association between supportive or constructive types of parental reactions to children's negative emotions and children's emotional and social competence. Supportive parental reactions are those that are comforting for the child, teach the child constructive coping techniques, or encourage emotional expression (Eisenberg et al., 1998a; Fabes et al., 2002). Problem-focused responses occur when parents help their children solve the negative emotion-evoking problem (Fabes et al., 2002). Emotion-focused responses occur when the parent responds to negative emotions by using strategies that will reduce the children's negative emotions, either through comforting or distracting them (Fabes et al., 2002). Expressive encouragement describes reactions in which parents are fully accepting of children's negative emotional expressions (Fabes et al., 2002).

These three types of supportive reactions are thought to improve children's social and emotional competence by enhancing their readiness to learn about their own and others' thoughts, emotions, and behaviours in emotion-provoking situations, and by increasing their attempts to cope constructively with their own emotions (Eisenberg et al., 1998a). Consequently, these children are better equipped to avoid becoming overaroused or behaviourally dysregulated when they find themselves in negative emotion-provoking situations (Eisenberg et al., 1998a). It is believed that the experience of learning to cope with their emotions while being supported by their parents gives these children the confidence to cope with their negative emotions in other contexts without their parents' assistance (Eisenberg et al., 1998a).

Research on child outcomes related to supportive parental reactions to children's negative emotions has shown positive results, including greater social and emotional competence. For example, in the same study that was described above, Eisenberg and

colleagues (1996) found that children whose parents engaged in emotion-focused reactions when they displayed negative emotions displayed higher levels of empathy and had more positive peer relations. However, they found that this link was strongest for the preschool-aged children and less common for the school-aged children. They also found that children whose parents engaged in problem-focused responses to negative emotions had better developed social skills.

Denham and Kochanoff (2002) explored the relation between supportive parental reactions to children's negative emotions and children's emotion knowledge using a sample of 134 preschool-aged children and their mothers and fathers. They measured parental reactions to children's negative emotions by having the mothers and fathers complete the Coping with Children's Negative Emotions Scale (Fabes et al., 1990) and by observing them during an interaction task in which they were asked to reminisce times when they felt certain emotions. Children's emotion knowledge was assessed by asking children to identify the appropriate facial expression for a puppet after a series of stories. The puppets had removable faces and the stories presented the children with eight situations where they were likely to feel the same emotion as the puppet and eight situations where the puppet's emotion would likely differ from their own. In addition, the children completed the Kindergarten Assessment Test-Mixed Emotions (Gordia et al., 1989), which presents children with stories in which a child feels two emotions and the participants are asked to identify both emotions. They also completed a subset of the Kindergarten Assessment Test-Display Rules (Gross & Harris, 1988), which consists of stories in which a child feels emotions that should be hidden in some stories and should be shown in other stories. The participants were asked to identify how the child in the story feels, how the child looks on his/her face, and how the other person in the story

would think the child felt. These researchers found that children whose parents displayed more problem-focused, emotion-focused, and expressive encouragement reactions to their negative emotions tended to have higher levels of emotion knowledge.

Using a sample of 74 boys and girls between the ages of 4 and 5 years, Denham (1997) examined the relation between emotion-focused parental reactions to children's negative emotions and children's peer relations and empathy. Denham assessed parental reactions to negative emotions using a puppet task in which the puppet was portrayed as experiencing several emotions and the children identified how the parent in the story would react. Peer relations and empathy were assessed by teachers completing the Preschool Competence Questionnaire (Olson, 1984). She found that emotion-focused parental reactions were associated with higher rates of empathy and more positive peer relations for children.

In the same study described earlier, Eisenberg and Fabes (1994) examined the relation between mothers' reactions to children's negative emotions and children's temperament and anger behaviours using a sample of 79 mothers and their 4- to 6-year-old children. They found that children whose mothers encouraged their expression of emotion or helped them problem-solve had higher levels of attentional control. In addition, children whose mothers reacted by engaging in comforting behaviours tended to use more constructive verbalizations rather than venting when they were angry.

Taken together, the studies reviewed highlight the impact of parental reactions to children's negative emotions on the children's emotional and social competence. Unsupportive parental reactions, including punitive, minimizing, and parental distress reactions, have been linked to lower emotion knowledge, lower levels of empathy, and lower social responsiveness. In contrast, supportive parental reactions, including

emotion-focused, problem-focused, and expressive encouragement reactions, have been linked to higher levels of empathy and sympathy, better perspective-taking skills, the ability to read others' emotions, higher rates of friendliness, and positive relations with peers. Given these findings, the three types of supportive reactions to children's negative emotions are associated with the development of social and emotional competence, while the three types of unsupportive reactions are associated with difficulties in these areas of development.

The research reviewed above has shown that mothers' reactions to children's negative emotions are linked to children's development of various aspects of emotional and social competence. The present study focused exclusively on specific components of emotional and social competence to extend past research in this area. Emotion regulation is a highly valued component of emotional competence. Emotion regulation was assessed in this study by examining children's ability to control their emotions rather than easily becoming distressed and displaying emotional lability. Social skills were assessed by measuring children's observable skills in four areas of social competence: assertion, cooperation, responsibility, and self-control. Research that has been done on these specific components of emotional and social competence will now be reviewed.

Links Between Maternal Reactions to Children's Negative Emotions and Children's Emotion Regulation Skills

It is believed that children learn emotion regulation skills through interactions with their caregivers and other highly significant people in their lives (Thompson, 1994). The supportive maternal responses to children's negative emotions, including problem-focused, emotion-focused, and emotional encouragement responses, are all forms of direct interventions that mothers can offer their children to help them learn to regulate

their emotions (Thompson & Meyer, 2007). During problem-focused responses, the mother teaches the child how to respond adaptively to emotion-provoking situations (e.g., solving the problem that they are finding frustrating; Thompson & Meyer, 2007). During emotion-focused responses, mothers are teaching their children how to directly manage their emotions (e.g., by distracting themselves or using relaxation techniques to calm themselves down; Thompson & Meyer, 2007). During emotional encouragement responses, mothers facilitate children's acquisition of emotion regulation skills by enabling them to express their negative emotions but also helping them to do so in a more constructive manner (e.g., use appropriate words to express your feelings to peers instead of hitting). Parents who engage in these supportive reactions help their children reduce their negative emotional arousal, which helps children learn to regulate their emotional arousal on their own by internalizing the regulation strategies (Eisenberg et al., 1998a; Shipman et al., 2007). These strategies include identifying the emotion, coping with or tolerating the emotion, and expressing the emotion in a manner that is considered socially acceptable (Shipman et al., 2007). Consequently, these children are better equipped to avoid becoming overaroused or behaviourally dysregulated when they are in negative emotion-provoking situations (Eisenberg et al., 1998a).

In contrast, mothers who react in an unsupportive manner (i.e., punishing reactions, minimizing reactions, or personal distress reactions) are not teaching their children emotion regulation skills and instead may intensify their child's negative emotions and teach them dysregulated behaviours and responses (Shipman et al., 2007). It is believed that these unsupportive reactions and the resulting increase in negative affect teach children to hide their negative emotions and view them as threatening, teach them to mimic their mothers' actions and either engage in punishing, minimizing, or

distress behaviours, and cause the child to experience increased physiological reactions and anxiety during future negative emotional experiences (Buck, 1984; Eisenberg et al., 1996; Eisenberg et al., 1998a; Roberts & Strayer, 1987).

Research has supported the link between maternal reactions to children's negative emotions and children's emotion regulation skills. For example, Perry, Calkins, Nelson, Leerkes, and Markovitch (2012) found a significant link between unsupportive maternal reactions to children's negative emotions and children's emotion regulation skills.

Maternal reactions to children's negative emotions were measured using the Coping with Children's Negative Emotions Scale (Fabes et al., 1990). Maternal minimizing, punishing, and personal distress reactions were combined into one unsupportive reactions variable. Children's emotion regulation skills were assessed with the Emotion Regulation Checklist (Shields & Chicchetti, 1997) and by observing children's reactions to a frustrating laboratory task. Using a sample of 197 4-year-olds and their mothers, they found that maternal unsupportive reactions to children's negative emotions predicted children's parent-reported emotion regulation skills.

Lukenheimer and colleagues (2007) examined the effect of emotion-dismissing parental reactions on a sample of 87 8- to 11-year-old boys' and girls' emotion regulation abilities. They defined parental emotion-dismissing as a belief that negative emotions are toxic or overwhelming, a desire to protect themselves and their children from negative emotions, and the tendency to invalidate or criticize their children's emotions. These researchers measured parental reactions during a family discussion task and gathered information on the children's emotion regulation skills using the mother, father, and teacher reports of the Emotion Regulation Checklist (Shields & Cicchetti, 1997). They

found that children whose parents engaged in emotion-dismissing behaviours had poor emotion regulation skills.

Using a sample of 43 mother-child dyads, Sprinrad, Stifter, Donelan-McCall, and Turner (2004) used a longitudinal design to examine the link between mothers' responses to their 18 and 30 month old infants' negative emotions and those children's emotion regulation skills when they were 5 years old. Mother's reactions to children's negative emotions were measured by coding their observed reaction during frustrating and unpleasant scenarios (e.g., a frustrating toy removal task). Mothers' reactions were coded for whether they used a strategy to help the child regulate their affect, labelled the child's emotion, labelled the child's emotion and used a strategy to help them regulate their affect, or did not use any regulation strategies and did not label the emotion. Children's emotion regulation skills were measured by examining children's ability to mask disappointment during a disappointment task. These researchers found that mothers' reactions when the children were 30 months old were related to children's emotion regulation at 5 years of age. Specifically, questioning the children's emotions when they were infants, which is a form of minimizing reaction, was related to poor emotion regulation skills when the children were 5 years old.

Eisenberg et al. (1996) investigated the impact of minimizing and punishing reactions on third and sixth graders' coping skills. They assessed parental reactions to children's negative emotions using parents' responses to the Coping with Children's Negative Emotions Scale (Fabes et al., 1990). Children's coping skills were measured using the Children's Coping Strategies Checklist (Ayers, Sandler, West, & Roosa, 1990), which was completed by the children's mothers and teachers. Using a sample of 148

boys and girls, they found that children whose parents used minimizing reactions engaged in more avoidant coping techniques and fewer constructive coping techniques.

Similarly, Eisenberg and Fabes (1994) studied the relation between mothers' reactions to children's negative emotions and children's coping skills using a sample of 79 mothers and their 4- to 6-year-old children. They found that children whose parents engaged in punishing or minimizing reactions had poor emotional coping skills; these children used fewer constructive coping techniques and more avoidant coping techniques during peer conflict situations, they did not tend to vent their emotions, and they usually tried to escape or seek revenge during anger-provoking situations with their peers. They also found that parental distress reactions were linked to behavioural avoidance and low levels of venting when children felt angry.

Using a sample of 76 preschool-aged children and their mothers, Berlin and Cassidy (2003) studied the link between mothers' suppression of their children's emotional expression and these children's emotion regulation abilities. They measured mothers' suppression reactions to their children's negative emotional expressions by having the mothers complete the Parent Attitude Toward Child Expressiveness Scale (Saarni, 1985). Children's emotion regulation skills were assessed by coding children's emotion reactions to a frustrating laboratory task. These researchers found that children whose mothers suppressed their negative emotional expressions were more likely to suppress their anger and were less likely to express sadness and to share their sadness with their mothers, thus showing poor emotion regulation skills.

Research also has shown an association between supportive maternal reactions to children's negative emotions and children's emotion regulation skills. In the same study that was described above, Eisenberg and colleagues (1996) found that children whose

parents engage in emotion-focused reactions when they display negative emotions use more constructive coping techniques. They also found that children whose parents engage in problem-focused responses to negative emotions use more constructive coping skills.

Cole, Dennis, Smith-Simon, and Cohen (2009) investigated the link between maternal reactions to children's distress and children's coping skills using a sample of 116 boys and girls between the ages of 3 and 4 years. They assessed maternal reactions by observing and rating the degree to which mothers supported and structured their child's negative emotions during a frustrating wait task. They also assessed children's coping skills. Specifically, they assessed children's ability to generate coping strategies using a puppet task in which they are to explain how the puppet can stop feeling sad or angry. Cole and colleagues (2009) found that maternal support in response to children's distress was linked to better strategy generation for coping with anger and sadness.

However, in the same longitudinal study described above, Sprinrad and colleagues (2004) found mixed results for the long term effects of supportive maternal reactions to infants' distress and children's later emotion regulation strategies. These researchers found inconsistent patterns for soothing, acceptance, and distraction responses to children's negative emotions. Mothers who soothed their infants or who accepted their infants' emotional expressions (i.e., emotion-focused and emotional encouragement responses) when their children were 15 months old tended to have children who were skilled at using distraction to regulate their emotions when they were 5 years old. In contrast, mothers' use of these two supportive strategies when the infants were 30 months old was related to lower rates of emotion regulation when the children were 5 years old. The researchers believed that these supportive reactions help teach children how to cope

with emotion appropriately when they are young infants, but that by 30 months of age the infants have developed some regulation strategies and do not need to be directly comforted during challenging situations. Instead, these children may need more cognitively advanced input from their mothers during challenging situations, such as explaining the situation or the cause of the emotion to the child. Indeed, these researchers found that the use of explanation responses to 30-month-old infants' distress was linked to higher levels of emotion regulation skills in the 5 year olds.

The studies that have been completed in this field so far have shown that parental reactions to children's negative emotions are associated with children's emotion regulation skills. Specifically, minimizing, punishing, and personal distress reactions have been linked with poor emotion regulation skills and poor coping skills in infants, preschool-aged, and school-aged children (Berlin & Cassidy, 2003; Eisenberg et al., 1996; Eisenberg & Fabes, 1994; Lukenheimer et al., 2007; Perry et al., 2012; Spinrad et al., 2004). In contrast, emotion-focused and generally supportive maternal reactions to children's negative emotions have been linked with more adaptive coping skills in children (Cole et al., 2009; Eisenberg et al., 1996). The present study expanded upon this literature base by examining the links between six types of maternal reactions to children's negative emotions and children's emotion regulation skills. Minimizing, punishing, personal distress, emotion-focused, problem-focused, and expressive encouragement responses were measured. In addition, the effect of the quality of the parent-child relationship on this link was also investigated.

Links Between Maternal Reactions to Children's Negative Emotions and Children's Social Skills.

As reviewed above, research has revealed a strong link between mothers' reactions to children's negative emotions and children's development of social competence. Specifically, unsupportive maternal reactions were linked to more behavioural problems and less empathic and social responsiveness (Fabes et al., 2001; Eisenberg et al., 1996; Lunkenheimer et al., 2007) while supportive maternal reactions were linked to better perspective-taking skills, higher empathy and sympathy for others, and more positive relations with peers (Denham, 1997; Eisenberg et al., 1991; Eisenberg et al., 1996). The present study investigated the link between mothers' responses to children's negative emotions and one important component of social competence, social skills. Four types of social skills were investigated: cooperation, assertion, responsibility, and self-control.

Cooperation skills refer to behaviours such as helping others, complying with rules and directions, and sharing (Gresham & Elliot, 1990). Assertion skills include initiating behaviours, such as introducing oneself, asking others for information, and responding to others' actions (Gresham & Elliot, 1990). Responsibility skills include all behaviours that show the child's ability to communicate with adults and show respect toward property or work (Gresham & Elliot, 1990). Self-control skills refer to behaviours that could occur in conflict situations, such as responding appropriately to teasing, as well as behaviours that could occur in non-conflict situations that require compromising and taking turns (Gresham & Elliot, 1990). Research examining the link between mothers' reactions to children's negative emotions and these four specific social skills has been limited.

It is believed that supportive reactions to children's negative emotions improve children's social skills by enhancing their readiness to learn about their own and others' thoughts, emotions, and behaviours in emotion-provoking situations, and by increasing their ability to cope with their own emotions in a way that allows them to maintain positive social interactions (Eisenberg et al., 1998a). These skills are believed to help children engage in socially appropriate behaviour (Eisenberg et al., 1998a); children who have a stronger ability to control their own emotions and who have more empathy and understanding for others are likely to find it easier to cooperate with others, to act responsibly, to show self-control in social situations, and to respond to conflict with assertion rather than aggression. In contrast, unsupportive reactions to children's negative emotions teach the children maladaptive responses to their own and others' negative emotions, such as punishing, minimizing, or becoming increasingly distressed (Roberts & Strayer, 1987). Children who learn these unsupportive responses will likely find it more difficult to respond to others in a cooperative, responsible, assertive, and self-controlled manner because they have not been taught appropriate emotion regulation strategies and have a weaker understanding of their own and others' thoughts, emotions, and behaviours.

The limited research that has focused on behaviours relevant to these four areas of social skills has supported these theories. For example, Eisenberg and Fabes (1994) studied the relation between mothers' reactions to children's negative emotions and children's anger reactions using a sample of 79 mothers and their 4- to 6-year-old children. They found that children whose parents engaged in punishing or minimizing reactions usually tried to escape or seek revenge during anger-provoking situations with their peers. They also found that parental distress reactions were linked to behavioural

avoidance when children felt angry. Though these authors did not measure cooperation, assertion, responsibility, or self-control skills, the escape and avoidance reactions that they observed suggest that these children lacked strong assertion skills. In addition, the revenge behaviours that they observed suggest that these children lacked appropriate self-control, cooperation, and responsibility skills, as these skills would inhibit a child's desire to seek revenge.

In contrast, using a sample of 74 boys and girls between the ages of 4 and 5 years, Denham (1997) examined the relation between emotion-focused parental reactions to children's negative emotions and children's cooperation behaviours. Denham assessed parental reactions to negative emotions using a puppet task in which the puppet experiences several emotions and the children identify how the parent in the story would react. Cooperativeness was assessed by having teachers complete the Preschool Competence Questionnaire (Olson, 1984). Denham found that emotion-focused parental reactions were associated with higher rates of cooperative behaviours in children.

Similarly, Eisenberg and colleagues (1996) found that children whose parents engaged in emotion-focused reactions when they displayed negative emotions engaged in more cooperative behaviours. They also found that children whose parents engaged in problem-focused responses to negative emotions had better developed social skills and were rated as being more friendly and cooperative. Children's social skills were measured using parent, teacher, and child responses to an adapted version of Harter's (1979) Perceived Competence Scale for Children. This scale included items that assessed broad and general social skills, including whether the child acts appropriately, does what they are supposed to, or gets in arguments with other children. They assessed parental

reactions to children's negative emotions using parents' responses to the Coping with Children's Negative Emotions Scale (Fabes et al., 1990).

More recently, Cunningham, Kliewer, and Garner (2009) found relations between maternal emotion socialization and children's social skills in a sample of 69 African American youth (9 to 13 years) living in high violence areas. These researchers used a global measure of emotion socialization that included mothers' awareness of their own and their children's emotions, acceptance of their own and their children's emotions, and their tendency to coach their children through negative emotions (a form of supportive reactions to children's negative emotions). Children's social skills were assessed using a composite of two scales of the Teacher-Child Rating Scale (Hightower et al., 1986), which included assertion skills and peer sociability. These researchers found that the maternal emotion socialization composite predicted children's assertion skills and peer sociability. Although they did not explore the direct link between maternal supportive reactions to children's negative emotions and children's assertion skills, this study provides preliminary support for the model proposed in the current study in a high risk African American sample.

These past studies have revealed links between supportive reactions to children's negative emotions and children's cooperation behaviours, and between unsupportive reactions to children's negative emotions and children's escape, avoidance, and revenge behaviours. However, a more global picture of the relation between parental reactions to children's negative emotions and children's social skills is lacking. The present study attempted to fill this void in the literature by examining relations between six parental responses to children's negative emotions (punishing, minimizing, personal distress, emotion-focused, problem-focused, and expressive encouragement) and four types of

children's social skills (cooperation, assertion, responsibility, and self-control skills). In addition, the present study examined whether the quality of the parent-child relationship had an effect on this pathway.

Links Between Children's Emotion Regulation and Social Skills

Several aspects of emotional competence, including emotion regulation, recognizing and understanding others' emotions, and emotion knowledge, are believed to be important precursors to social competence. For example, it is believed that the ability to regulate one's own emotions to match societal standards and to respond empathically to others' emotions is necessary to be able to engage in successful social interactions (Denham & Grout, 1993; Garner & Estep, 2001). In addition, Halberstadt, Denham, and Dunsmore (2001) theorize that children need to be able to effectively receive emotional messages from others to have what they call Affective Social Competence. Receiving emotional messages requires the recognition that an affective message was sent, as well as the ability to understand and identify the meaning of the message (Halberstadt et al., 2001). Children who can understand emotional cues in their social environment are thought to develop strong social skills and to form positive personal relationships (Halberstadt et al., 2001).

In a meta-analysis of 63 published and unpublished studies that examined the link between emotion knowledge and social competence, Trentacosta and Fine (2010) revealed statistically significant mean effect sizes for this link, suggesting that emotion knowledge is a consistent predictor of multiple social outcomes across several age groups. The meta-analysis included studies of clinical and community samples that measured several components of emotion knowledge (e.g., emotion recognition, emotion labelling, affective perspective taking, emotion attributions, display rule knowledge) and

social competence (e.g., reported or observed levels of social skills, peer status, prosocial behaviour, social play behaviour). The children in these studies ranged from 2 to 18 years of age. This meta-analysis did not reveal any consistent moderators for the link between emotion knowledge and social competence, suggesting that emotion knowledge is a consistent predictor of social competence regardless of demographic variables or the type of respondent used.

Eisenberg and colleagues (1993) examined the link between children's emotion regulation skills and their degree of social acceptance. Using a sample of 91 preschool-aged boys and girls, they found that children's ability to effectively regulate their emotions predicted how well-liked they were by their peers. Similarly, using a sample of 81 preschool-aged children, Garner and Estep (2001) found that children's emotion knowledge predicted how liked they were by their peers and the degree to which they engaged in prosocial behaviours. In addition, the degree to which the children displayed positive emotional expressions during peer interactions predicted how well liked they were by their peers.

The present study sought to extend these previous findings by specifically examining the link between children's emotion regulation (their ability to regulate their emotions and the degree to which they display negative emotionality and emotional lability) and specific social skills (responsibility, cooperativeness, assertiveness, and self-control). It is believed that children who have strong emotion regulation skills are likely to be able to understand the causes of emotions, plan their behaviour effectively, engage in actions that are suited to situations they encounter, and inhibit behaviours that are not socially appropriate in their current situation, each of which facilitates socially appropriate responses and behaviours (Eisenberg et al., 2007). These children are able to

regulate their behaviour in a goal-directed manner, which is essential for engaging in socially appropriate interactions that meet the children's own goals while also satisfying the goals of their social partners (Eisenberg et al., 2007; Denham & Grout, 1993; Garner & Estep, 2001). In addition, children who can regulate their own emotions are more likely to be able to resolve conflict, find a mutually satisfactory play activity to engage in with their peers, compromise during play, and empathize with a peer who is in distress (Gottman, Katz, & Hooven, 1996). These skills are also central aspects of social competence and suggest appropriate social skill development (Gottman et al., 1996). In contrast, children who have trouble regulating their emotions and display larger proportions of negative affect are more likely to be viewed as troublesome and difficult by their peers and teachers (Denham et al., 1990).

Past research has supported this link. For example, in a sample of 104 preschool and kindergarten age children, Denham and colleagues (2003) found that poor emotion regulation was associated with more oppositional behaviours during interactions with peers. They conceptualized poor emotion regulation as instances of emotional venting and expressed anger, which they measured during observations of peer interactions. Children's social behaviour was assessed by teachers using adapted scales from The Social Competence and Behaviour Evaluation Short Form (LaFreniere & Dumas, 1996).

Relations between children's emotion regulation and social skills have been discovered across age ranges. For example, using a sample of 47 preschoolers and their mothers, Denham and Grout (1993) investigated the link between children's emotional expressions and their social skills, including friendliness, cooperativeness, tractability (e.g., nondomineering, mindful of rules), and non-aggressiveness. Social skills were assessed by teachers using The Baumrind Preschool Behaviour Q-Sort (Baumrind, 1968)

and emotional expression was assessed by observing children in natural settings and coding their vocal, facial, postural, or gestural emotional expressions. Children who showed more pleasurable emotions and who showed more controlled anger expressions (i.e., those who exhibited signs of emotion regulation skills) had greater social skills.

In a similar study, Denham and Burger (1991) investigated the relation between children's negative emotion expressiveness and their social skills in a sample of 54 preschoolers. Children's social skills were assessed by having teachers complete the Baumrind Preschool Behaviour Q-Sort (Baumrind, 1968). Children's negative emotional expressions were assessed during observations of the children engaging in free play with their peers. They found that children who displayed more anger and sadness were rated as less friendly and exhibited fewer prosocial behaviours. In contrast to hypotheses, the children's degree of negative emotional displays did not significantly predict children's level of assertiveness.

Links between emotion regulation and social skills have also been shown in school-age samples. For example, in a sample of 98 fourth grade girls and boys, McDowell, O'Neil, and Parke (2000) found that children who showed more intense negative emotional responses during a disappointment task tended to receive lower social competence ratings from their peers. In a follow-up study, McDowell, Kim, O'Neil, and Parke (2002) extended these findings with a sample of 104 fourth graders. They revealed a link between children's emotion regulation capacities and children's social skills, including teacher-rated prosocial behaviours and friendliness.

Garner and Estep (2001) expanded on past research by examining the link between two aspects of emotion regulation and three social skills. The social skills that were measured in this study included children's ability to successfully initiate social

interactions, the frequency of their prosocial behaviours, and how constructively they dealt with their own anger during peer interactions. Children's social skills were measured by coding peer interactions in the preschool setting. Children's emotion regulation was assessed by measuring the positivity of their emotional expression, which also was coded during peer interactions in the preschool setting, and by assessing their emotional intensity using the Behavioural Style Questionnaire (McDevitt & Carey, 1978), which was completed by the children's mothers. These researchers found that children who had more positive emotional expressions successfully initiated more social interactions, used fewer unconstructive reactions when they became angry with their peers, and engaged in more prosocial behaviours. Children whose emotional expressions were less intense and dysregulated also engaged in more prosocial behaviours.

Chang, Shelleby, Cheong, and Shaw (2012) examined these links in a high risk sample. These researchers used a longitudinal design to examine the link between children's emotion regulation skills and their social competence in a sample of 310 low-income, ethnically diverse 3- to 5-year-old boys. Children's emotion regulation was assessed when the children were 3.5 years old, using a frustration task that required the child to wait for a reward in an environment that lacked stimulation. Children's social competence was assessed in the school and the home. Social competence in the home was assessed by observing a structured sibling interaction task when the child was 5-years-old. The interactions were coded for negative reactivity after being provoked by their sibling, controlling behavior (e.g., grabbing toys and shouting "don't do that!"), and likability (how annoying or likable the target child is to others). Social competence in the school was assessed by creating a latent variable from three subscales of teacher-completed Social Skills Rating Scale questionnaires (Gresham & Elliot, 1990):

cooperation, assertion, and self-control. Teacher-report questionnaires were completed when the children were 6 years old. Chang and colleagues found that children's emotion regulation skills predicted their social competence at home and at school.

To summarize, the ability to regulate one's own emotions to match societal standards appears to be necessary to be able to engage in successful social interactions (Denham & Grout, 1993; Chang et al., 2012; Garner & Estep, 2001). Emotion regulation has specifically been linked to children's degree of social acceptance (Denham et al., 1990; Eisenberg et al., 1993), as well as their ability to resolve conflict (Garner & Estep, 2001; Gottman et al., 1996), find a mutually satisfactory play activity to engage in with their peers, compromise during play, and empathize with a peer who is in distress (Gottman et al., 1996). Links also have been shown between children's emotion regulation skills and their friendliness (Baumrind, 1968; Denham & Burger, 1991; McDowell et al., 2000), cooperativeness (Baumrind, 1968; Chang et al., 2012), non-aggressiveness and non-oppositional behaviour (Baumrind, 1968; Denham et al., 2003), social competence (McDowell et al., 2000), prosocial behaviour (Denham & Burger, 1991; Garner & Estep, 2001; McDowell et al., 2002), assertion (Chang et al., 2012), self-control (Chang et al., 2012), and the tendency to initiate social interactions (Garner & Estep, 2001). The present study sought to expand these previous findings by examining the link between children's emotion regulation skills and four types of social skills: cooperation, assertion, responsibility, and self-control.

Emotion Regulation as a Mediator of the Association between Maternal Reactions to Children's Negative Emotions and Children's Social Skills

It is often theorized that the link between parental emotion socialization behaviours and children's social skills is mediated by the children's emotion regulation

capacities (Eisenberg et al., 1998a; McDowell et al., 2002). The extent to which children are able to regulate their emotions affects their social competence in two important ways. First, the ability to control their emotional reactions increases their ability to attend to the messages their parents are sending them about appropriate social behaviour because they are less likely to be overaroused during episodes of discipline, which is when most of this type of teaching occurs (Grusec & Davidov, 2007). Second, children with emotion regulation skills can inhibit negative emotions that commonly fuel antisocial actions and that challenge prosocial actions (Grusec & Davidov, 2007). Therefore, it appears that emotion regulation skills may mediate the relation between parental emotion socialization behaviours and children's social competence.

Research has supported this mediational model. In a longitudinal study that followed 79 children from age 6 to 12 years, Eisenberg and colleagues (1999) found that children of mothers who responded to their negative emotions in a punitive manner or with personal distress displayed more disruptive behaviour with peers and adults, and this relation was partially mediated by poor emotion regulation skills.

In a study of 56 families with 4- to 5-year-old children, Gottman, Katz, and Hooven (1996) investigated the relation between parental reactions to children's negative emotions and children's emotion regulation and social skills with peers. They assessed children's emotion regulation with the Emotion Regulation Questionnaire (Katz & Gottman, 1986), which was completed by mothers, and by measuring children's vagal tone during emotion-provoking video clips. Vagal tone is the rate at which the vagus nerve in the parasympathetic nervous system fires; this is believed to be an adequate way to examine the possible physiological basis of the ability to regulate emotion (Gottman et al., 1996). They assessed parental reactions to negative emotions through semi-structured

interviews. Teacher-ratings of antisocial behaviours were measured with the Child Adaptive Behaviour Inventory (Cowan & Cowan, 1990). They found that children whose parents encouraged their negative emotional experiences and helped them understand and manage their negative emotions could regulate their emotions more effectively. In addition, these children's emotion regulation skills further predicted their competent, nonaggressive behaviours with peers, showing a mediational effect of emotion regulation.

To summarize, these studies provide support for the belief that children's emotion regulation capacities are the mechanism through which parental emotion socialization behaviours affect children's social skills. The aim of the present study was to replicate and extend these findings by investigating the possibility that the quality of the mother-child relationship affects how or when maternal emotion socialization behaviours influence children's emotion regulation and social skill development.

This study expands upon prior work by using varied measures of maternal reactions, children's emotion regulation, and children's social skills. Six types of maternal reactions to children's negative emotions were measured (i.e., punishing, minimizing, personal distress, emotion-focused, problem-focused, and expressive encouragement). When measuring emotional regulation, children's tendencies to become distressed and display emotional lability was considered. Social skills were assessed by measuring children's observable skills in four areas of social competence: assertion, cooperation, responsibility, and self-control. These methodological changes allowed a more detailed understanding of the links between maternal emotion socialization and children's emotional and social competence. In addition, the present study examined the effect of the quality of the mother-child relationship on each of these links. By including this construct, it was possible to examine how the quality of the mother-child relationship

affected the maternal emotion socialization process. That is, by examining the quality of the mother-child relationship, a better understanding of the conditions under which maternal emotion socialization practices have a stronger or weaker effect on children's emotional and social competence could be gained.

Links between the Quality of the Parent-Child Relationship, Maternal Emotion Socialization, and Children's Emotion Regulation and Social Skills

The research reviewed above suggests that emotion-related parenting practices, such as parents' responses to children's negative emotions, parental emotion expressiveness, and parental discussion of emotions with children, all have a strong impact on children's development of emotional and social competence. However, the impact of these parenting practices occurs within the context of a relationship. Thus, the result of these efforts is dependent on both the behaviours and the relationship in which they occur (Thompson & Meyer, 2007).

Several parent-child interaction characteristics have been used to examine the quality of the parent-child relationship in past research, including attachment quality, parenting behaviours (e.g., warmth, responsiveness, positivity, negativity, control, correcting), and interactional synchrony (e.g., Attili, Vermigli, & Roazzi, 2010; Berlin & Cassidy, 2004; Davidov & Grusec, 2006; Jackson, Brooks-Gunn, Huang, & Glassman, 2000; McDowell, Kim, O'Neil, & Parke, 2002). The relations between the quality of the parent-child relationship and parental reactions to children's negative emotions, children's emotion regulation skills, and children's social skills will now be reviewed.

Cassidy (1994) and Thompson (1994) were among the first to theorize about the link between the quality of the parent-child relationship and the maternal emotion socialization process. These theorists focused on attachment security as a measure of the

quality of the parent-child relationship. Cassidy and Thompson suggested that mothers of securely attached children are sensitive to and accepting of their children's positive and negative emotions and openly talk to their children about intense, confusing, or disturbing feelings. Indeed, in a study of preschool-aged children and their mothers, Berlin and Cassidy (2003) found that mothers of children who had a secure attachment were less likely to control their children's emotional expressions, and these children had better developed emotion regulation skills.

In contrast, Berlin and Cassidy (2003) found that mothers of children with an insecure-avoidant attachment were more controlling of their children's emotional expressions, and as a result these children were more likely to suppress their anger and displayed poor emotion regulation skills. Cassidy (1994) suggests that children who have developed an insecure attachment because their parents' pattern of responding was characterized by rejection (i.e., those with an insecure-avoidant attachment) are believed to be more likely to minimize their expression of negative emotions during distressing situations, which also inhibits the development of appropriate emotion regulation skills.

Several parenting qualities, such as parental responsiveness, parental warmth, and parental sensitivity, also have been thought of as measures of the quality of the parent-child relationship. Mother-child interactions that are marked by maternal sensitivity, warmth, and responsiveness have been associated with greater social skills and emotion regulation skills in children. For example, Lamb (1981) found that by 6 months of age, distressed infants begin to calm and quiet when they hear their mother approaching. In contrast, infants protest loudly when their mother approaches but does not pick them up to soothe them (Lamb & Malkin, 1986). Lamb and colleagues proposed that the infants' learned association between their distress, the mothers' approach, and the resulting

soothing has an effect on their development of emotion regulation skills because of the anticipatory soothing that the infant engages in. These findings suggest that parental responsiveness likely influences the development of children's emotion regulation skills at a very early age (Thompson & Meyer, 2007).

Similarly, Davidov and Grusec (2006) revealed a link between parental responsiveness and children's emotion regulation and social skills using a sample of 106 6- to 8-year-old children. Parental responsiveness to children's distress was assessed using the Coping with Children's Negative Emotions Scale (Fabes et al., 1990), the responsiveness to distress scale of the Child Rearing Practices Report of the Q-Sort (Block, 1981), the Interpersonal Reactivity Index (Davis, 1980), and by coding their responses to a short video clip of a child experiencing distress. Emotion regulation was assessed using the Emotion Regulation Checklist (Shields & Cicchetti, 1997), which was completed by mothers. Children's prosocial behaviour was assessed by examining their reactions to others in distress using parent-reports, teacher-reports, coded observations of the children's reactions to the researcher's simulated pain, and a child interview in which the child was asked how they would react to a series of peer distress vignettes. They found that children's emotion regulation skills partially mediated the link between parental responsiveness and children's tendency to react in a prosocial manner to another's distress.

Mother-child interactions that are marked by maternal sensitivity and warmth also have been associated with greater social skills and emotion regulation skills in children. For example, using a sample of 188 3- to 6-year-old children and their mothers, all of whom were considered to be low-income families, Jackson, Brooks-Gunn, Huang, and Glassman (2000) found that mothers who showed more supportiveness and warmth

during their interactions with their children were more likely to have children who exhibited more social responsiveness and fewer antisocial and conflictual behaviours with their peers.

McDowell, Kim, O'Neil, and Parke (2002) examined associations between parental warmth and responsiveness during parent-child interactions and children's emotion regulation and social skills using a sample of 103 fourth grade children and their mothers and fathers. Parenting warmth and responsiveness were assessed by coding observations of a family discussion task. They found that children with parents who exhibited warmth and responsiveness tended to have better emotion regulation skills, as exhibited by fewer intense anger and nervous reactions and a greater ability to cope with these emotions. Children whose parents were not considered to be warm and responsive had poorer social skills, and instead these children were rated as more aggressive, more socially avoidant, and less liked by their peers.

In a recent study, White and Renk (2012) examined the link between parental warmth and emotional availability and youths' externalizing behaviours using a sample of 208 10- to 15-year-old boys and girls. These researchers found that youths who had more positive perceptions of their mothers and fathers as warm and emotionally available tended to exhibit fewer externalizing behaviour problems. In addition, the youths who perceived higher levels of overall collective emotional support from their parents tended to exhibit fewer externalizing behaviour problems.

In a recent study, Brophy-Herb and colleagues (2010) tested whether maternal responsiveness mediated the relation between maternal emotion socialization practices and children's social and emotional competence using a sample of 119 toddlers and their mothers from low-income families. Maternal emotional expressiveness and maternal

emotion-coaching beliefs were used to assess maternal emotion socialization. Children's skills in four areas were used to measure their social and emotional competence, including compliance, age-appropriate play, drive to master new skills, and empathy. These researchers found that the link between maternal emotion socialization and children's emotional and social competence was partially mediated by mothers' responsiveness. This means that maternal emotion socialization directly impacts children's emotional and social competence, but part of its effect also occurs through the effect of maternal responsiveness.

The research reviewed thus far shows a clear link between maternal supportiveness, warmth, and responsiveness and children's social and emotional functioning. However, these studies all focused on maternal behaviours as an indicator of the quality of the parent-child relationship and did not assess the child's role in the relationship. Another way to assess the quality of the parent-child relationship is to consider the level of interactional synchrony in the relationship.

Interactional Synchrony

The present study examined the quality of the mother-child interaction using a measure called interactional synchrony. Interactional synchrony has been defined as the degree of responsiveness, reciprocity, interconnectedness, engagement, shared affect, and mutual focus in an interaction between two individuals (Mize & Pettit, 1997).

As reviewed above, a number of parent-child interaction characteristics have been examined in order to better understand childhood emotion and social skill development (e.g., parental rigidity, parental warmth, parental responsiveness, parenting style). Interactional synchrony was chosen to assess the quality of the parent-child relationship in the present study for several reasons. First, interactional synchrony is thought to be a

good measure of the interactional style of a dyad because of its focus on how the interaction is occurring (e.g., synchronous or disjointed) rather than simply on what is occurring (e.g., play or teaching; Harrist & Waugh, 2002). Second, interactional synchrony is measured on a continuum. By rating the interactions on a continuum, rather than categorizing them, a more complete and detailed picture of the way in which the dyads interact can be captured.

Third, interactional synchrony is dyadic in nature. This observable characteristic considers each individual's interaction style when ratings are made and assesses the match between the members of the dyad (Harrist & Waugh, 2002). The dyadic nature of interactional synchrony is inherent in its definition and in the qualities that are rated when it is examined (i.e., mutual regulation, reciprocity, and harmony during interactions). These states cannot be achieved alone; they require mutual negotiation and turn-taking that can only be achieved in a dyadic interaction (Harrist & Waugh, 2002). Thus, synchrony represents a continuous social coordination rather than discrete states of communication (Fogel, 1993). High levels of interactional synchrony require that both members of the dyad adapt to each other and fit their behaviours to their partner's so that their actions are partly their own and partly appropriate reactions to their partner's action (Fogel, 1993; Vizziello, Ferrero, & Musicco, 2000). A highly synchronous interaction is co-constructed by both members of the dyad. Taking the actions and reactions of both partners in a dyad into account is rare within other measures of parent-child interactions (e.g., parental warmth). Thus, the dyadic nature of interactional synchrony is what makes it unique among the other measures of parent-child relationships, and using this construct is an added strength of the present study.

The link between interactional synchrony and children's social skills has been strongly supported by preliminary research in this area. The work that has been done so far has shown a promising association between higher levels of parent-child synchrony and better social skill development in children. For example, Lindsey, Mize, and Pettit (1997) investigated the link between preschool-aged children's social competence and interactional synchrony in parent-child relationships during a free play task with 35 parent-child dyads. Interactional synchrony was rated on a five-point scale where high scores represented dyads who were mutually focused, mutually responsive, shared similar affect, and engaged in the task equally. They found that children in father-child dyads with higher interactional synchrony ratings were rated as being more socially competent by their teachers, and children in mother-child dyads with higher synchrony ratings were rated as better liked by their peers than children in less synchronous dyads.

Mize and Pettit (1997) conducted another study with 43 mother-child dyads using the same measure of interactional synchrony. Using sociometric peer assessments and teacher reports, they found that preschool aged children in mother-child dyads with higher levels of interactional synchrony during a free play task were better liked by their peers and were rated as more socially skilled by their teachers. In addition, Criss, Shaw, and Ingoldsby (2003) investigated interactional synchrony in mother-child interactions with 10-year-old boys during a parent-child discussion of family conflicts task with 122 families. These researchers found that children who had higher levels of interactional synchrony during the mother-child interaction had higher parent-reported social skills than children who had less synchronous interactions with their mothers.

Harrist, Pettit, Dodge, and Bates (1994) studied 30 kindergarten-aged children and their mothers to determine if interactional synchrony during a two hour home observation

period would be predictive of teacher reported social competence. They assessed interactional synchrony on a five-point scale where high scores represented dyads who shared mutual affect, attention, turn-taking, and involvement, and were characterized by reciprocity and a sense of connectedness. They found that children from dyads who engaged in positive and highly synchronous interactions with their mothers were viewed as more socially competent by their teachers.

Research has also shown a link between poor interactional synchrony and children's antisocial behaviour levels. Criss and colleagues (2003) investigated the relation between antisocial behaviour and interactional synchrony levels in interactions between parents and their 10-year-old sons using a longitudinal design. Interactional synchrony levels were rated using the same method as previously described during an interaction in which the parent and child discussed family conflicts. The results of this study showed that children who had higher levels of interactional synchrony during the parent-child interaction had lower levels of self-reported antisocial behaviour and had friends who engaged in lower levels of antisocial behaviour. Interestingly, interactional synchrony levels continued to significantly predict child antisocial behaviour levels even after controlling for the child's antisocial behaviour level measured two years prior. In addition, interactional synchrony levels continued to significantly predict the level of antisocial behaviour in the child's friend group even after controlling for the level of antisocial behaviour in the child's friend group two years prior.

Although the association between interactional synchrony in parent-child relationships and children's social skills has been shown in each of the initial studies on this topic, the association between synchrony and children's emotion regulation skills has not yet been empirically tested. However, studies on interactional synchrony during

parent-child interactions have shown that lower levels of interactional synchrony are related with higher levels of behaviours that are typically believed to be indicative of emotion regulation deficits, including externalizing behaviour (Deater-Deckard, Atzaba-Poria, & Pike, 2004) and aggression (Ambrose & Menna, 2013; Harrist et al., 1994; Mize & Pettit, 1997; Pasiak, Norman, & Menna, 2011).

Research on emotion regulation also has found that specific aspects of interactional synchrony are associated with the development of this important skill. For example, research has found that balance in leading and following during parent-child interactions, a quality that is emphasized in interactional synchrony coding, may play a role in infants' development of early emotion regulation skills. Calkins and Johnson (1998) studied the link between how interfering mothers were during interaction tasks and the intensity of 18-month-old infants' emotional reactions during a frustration task. They found that the infants who became more distressed had mothers who tended to be more interfering during their interactions together. In contrast, the infants whose mothers offered support, suggestions, and encouragement during their interactions throughout the frustration task tended to be able to use problem-solving and distraction to self-soothe. Parent-child dyads who achieve a high level of interactional synchrony have a sense of balance in that each individual leads and follows equally; in contrast, when one member of the dyad is pushy or intrusive, their level of interactional synchrony is considered to be lower (Mize & Pettit, 1997). Thus, the results of Calkins and Johnson's study suggest that balance between leading and following during parent-child interactions may influence the development of early emotion regulation skills.

Similarly, research on the association between interactional synchrony and maternal emotion socialization is also lacking. The results of a study completed by

Sprinrad and colleagues (2004) suggested that an association may exist between minimizing maternal reactions to children's negative emotions and interactional synchrony. Using a sample of 43 mother-child dyads, Sprinrad and colleagues used a longitudinal design to examine the relations between mothers' responses to their 18- and 30-month-old infants' negative emotions and those children's emotion regulation skills when they were 5 years old. They found that infants whose mothers who engaged in minimizing reactions by questioning their emotions (e.g., "why are you crying?") displayed poor emotion regulation skills when they were 5 years old. One component of interactional synchrony is how in tune the mother and child are with each other. It seems reasonable to believe that mothers who are in tune with their children's emotions and needs would not have to question their children's emotions in this way, suggesting that this type of minimizing reaction may be associated with lower levels of interactional synchrony in the parent-child relationship.

Theorists (e.g., Thompson & Meyer, 2007) have stated that there is a need for research that directly examines whether the influence of parental emotion socialization behaviours is affected by the quality of the parent-child relationship. The research that has been completed thus far suggests that measures of the quality of the mother-child relationship, including maternal warmth, supportiveness, and responsiveness, are associated with children's development of emotion regulation and social skills. However, these studies have assessed the quality of the mother-child relationship in a way that only accounts for the behaviours of one member of the mother-child dyad. Studies that measure the quality of the mother-child relationship by assessing interactional synchrony during mother-child interactions address this concern because these ratings take both the mother and child's actions into consideration. Past research has shown a strong

association between interactional synchrony in the parent-child relationship and children's social skills. However, more research is needed to test the direct association between parent-child interactional synchrony and children's emotion regulation skills. In addition, to the author's knowledge, the relation between interactional synchrony and parents' reactions to children's negative emotions has not yet been tested. The present study fills these gaps in the literature by investigating possible links between mothers' reactions to children's negative emotions, mother-child interactional synchrony levels, and children's emotion regulation and social skills.

The present study tested two models that have been proposed to explain how maternal reactions to children's negative emotions and mother-child interactional synchrony levels interact to affect children's emotional and social functioning. Theorists and researchers in the field have suggested both mediation and moderation models to explain these complex links. For example, Eisenberg and colleagues (1998b) suggest that the effectiveness of parental emotion socialization behaviours on children's development of emotional and social competence is moderated by several parenting dimensions, including the quality of the parent-child relationship. That is, the quality of children's relationships with their parents may influence how these children respond to parents' emotion-related parenting practices, including parents' reactions to children's negative emotions (Eisenberg et al., 1998a). In contrast, others have suggested that the link between these constructs is better explained by a mediation model; the quality of the mother-child relationship influences the types of reactions mothers have to their children's negative emotions, which in turn affects the children's development of social and emotional competence (e.g., Cassidy, 1994; Thompson, 1994). As reviewed above, research conducted by Berlin and Cassidy (2003) and Brophy-Herb and colleagues (2010)

has shown preliminary support for this mediation model. The present study sought to examine both of these proposed models to clarify the complex relation between maternal emotion socialization, the quality of the mother-child relationship, and children's emotion regulation and social skill development.

Study Purpose and Objectives

The overall purpose of the present study was to determine whether maternal reactions to children's negative emotions would predict children's emotional and social competence, and whether the quality of the mother-child relationship would affect this pathway. Based on the previous research and theories, the following four objectives guided this study.

The first objective was to determine whether maternal reactions to children's negative emotions would be predictive of children's ability to regulate their own emotions. The present study sought to corroborate past research that has found this association by examining six supportive and unsupportive reactions to children's negative emotions, including punishing, minimizing, personal distress, emotion-focused, problem-focused, and expressive encouragement.

The second objective was to determine whether maternal reactions to children's negative emotions would be predictive of children's social skills. The present study sought to extend past research that has found this association by examining four primary types of social skills: assertion, responsibility, cooperation, and self-control during interactions with peers and adults.

The third objective was to determine whether the association between maternal reactions to children's negative emotions and children's social skills would be mediated by children's emotion regulation skills. That is, the mechanism through which maternal

reactions affect children's social skills was expected to be the children's ability to regulate their emotions. Past research has supported this mediational model (e.g., Davidov & Grusec, 2006; Eisenberg et al., 1999; Gottman et al., 1996). The present study aimed to replicate past research in this area and to extend it by examining a number of maternal reactions to children's negative emotions (i.e., three supportive reaction types and three unsupportive reactions types).

The fourth objective of this study was to examine the links between interactional synchrony, mothers' reactions to children's negative emotions, and both child outcome variables. Two models were explored: a mediation model (see Figure 2a) and a moderation model (see Figure 2b). The mediation model predicted that mothers' reactions to children's negative emotions would mediate the link between interactional synchrony in the mother-child relationship and children's development of emotion regulation and social skills. The moderation model predicted that the interaction between maternal reactions to children's negative emotions and the quality of the mother-child relationship would predict children's emotion regulation and social skills better than either predictor did alone. The quality of the parent-child relationship was assessed by measuring the level of interactional synchrony that occurred during interactions between mothers and children during two interaction tasks.

The present study extends previous findings in this field by using more diverse methodology. Six possible maternal reactions to children's negative emotions were assessed and included in the analyses rather than focusing on only supportive or unsupportive reactions. Emotion regulation was assessed using a questionnaire that measured children's ability to control their emotional reactions by examining their emotional negativity and lability. The social skills that were tested were four specific

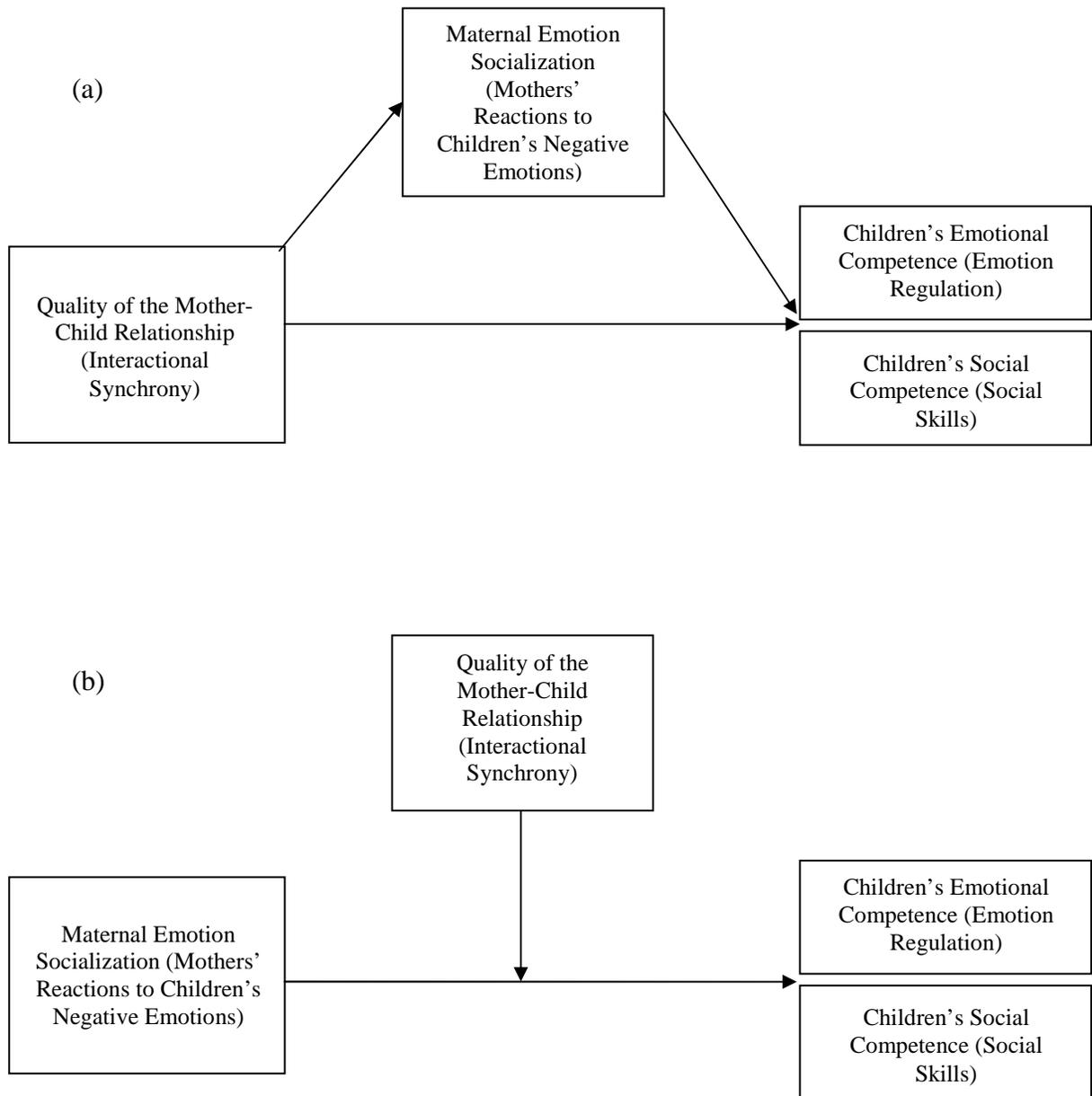


Figure 2. Proposed Relations between Maternal Reactions to Children's Negative Emotions, Children's Emotion Regulation Skills, Children's Social Skills, and the Quality of the Mother-Child Relationship. Panel (a) represents mother-child relationship quality as a mediator, and panel (b) represents this variable as a moderator.

subsets of behaviours that are highly valued by Western society (assertion, cooperation, responsibility, and self-control), and they assessed the children's social skills during interactions with known adults, known peers, and strangers. The quality of the mother-child relationship was assessed by coding videotaped interactions for the level of interactional synchrony exhibited by each mother-child dyad. Synchrony was assessed during two mother-child interaction tasks in order to gain a more complete measure of each dyad's level of interactional synchrony. A free play and a structured goal-oriented task were used, both of which have been recommended and supported in past research on this topic (Davenport, Hegland, & Melby, 2007; Mize & Pettit, 2007; Russell, Pettit, & Mize, 1998). The synchrony scores derived from these two tasks were not combined to elicit a total synchrony score, but rather were used separately in analyses so that differences in the tasks' predictive abilities could be examined. Using both tasks allowed for a total of twenty minutes of observed interaction time.

Free play between a mother and child is a highly informative task for research on the quality of relationships (Davenport et al., 2007) and has been used in many studies examining interactional synchrony (e.g., Lindsey, Mize, & Pettit, 1997; Mize & Pettit, 1997). This task is widely used because it allows for observation of an unstructured spontaneous interaction that is relatively naturalistic but that maintains an adequate degree of experimenter control and standardization (Mize & Pettit, 1997). The way that a mother and child interact during free play is important because it is believed that the learning of affect regulation, the practicing of skills, and the acquiring of attitudes that transfer to peer groups can all be completed in the context of free play interactions (Parke, Cassidy, Burks, Carson, & Boyum, 1992).

It is believed that dyads' interactional synchrony levels differ between free play tasks and more structured and goal-oriented tasks because, given that past research has found differences in other parenting behaviours between play tasks and structured tasks (Davenport et al., 2007). In a past study examining interactional synchrony in mother-child dyads with preschool-aged children, Ambrose and Menna (2013) found that interactional synchrony was significantly lower in the structured teaching task than it was in the unstructured free play task. It is possible that structured tasks are more likely to elicit guiding and structuring behaviours from the mother, and are more likely to elicit frustration from the children due to the structure of the task, to which the mother then has to react (Davenport et al., 2007). Thus, the structured task was used in the present study to obtain another view of the interactional style of the dyad.

Study Hypotheses

The first hypothesis was that higher levels of unsupportive maternal reactions (i.e., punishing, minimizing, or personal distress reactions) would predict lower levels of emotion regulation. Children whose parents engage in these types of reactions would not be as skilled at controlling their own emotions, would express more negative emotions, and would shift from one emotional state to another very quickly. In contrast, it was hypothesized that higher levels of supportive maternal reactions (i.e., emotion-focused, problem-focused, or expressive encouragement) would predict higher levels of emotion regulation. Children whose mothers engage in these reactions were expected to be more skilled at controlling their emotions, experience negative emotions less, and not experience as much emotional lability.

The second hypothesis was that higher levels of unsupportive maternal reactions to children's negative emotions would predict lower levels of social skills in the children.

That is, children whose mothers engage in more punishing, minimizing, or personal distress reactions were expected to display fewer assertive, self-control, responsibility, and cooperation behaviours. In contrast, it was hypothesized that higher levels of supportive maternal reactions to children's negative emotions would predict higher levels of these social skills. That is, children whose mothers engage in more emotion-focused, problem-focused, or expressive encouragement reactions were expected to display more assertion, self-control, responsibility, and cooperation behaviours.

The third hypothesis was that children's emotion regulation skills would predict their social skill levels. That is, children who had emotion regulation difficulties were expected to exhibit fewer cooperation, assertion, responsibility, and self-control skills, and those with more developed emotion regulation abilities were expected to exhibit more of these social skills.

The fourth hypothesis was that the link between parental reactions to children's negative emotions and children's social skills would be mediated by the children's emotion regulation skills. That is, it was expected that the mechanism through which parental reactions affect children's social skills would be the children's ability to regulate their emotions.

The final hypotheses explored the links between interactional synchrony, maternal reactions to children's negative emotions, and both child outcome variables. Two models were tested to explain the relationship between these variables. The first model, which was a mediation model, predicted that maternal reactions to children's negative emotions would mediate the link between the quality of the mother-child relationship (i.e., interactional synchrony) and children's emotion regulation and social skills. That is, higher levels of interactional synchrony were believed to influence mothers' tendency to

use more supportive reactions to children's negative emotions, which in turn would affect children's development of greater emotion regulation and social skills. Lower levels of interactional synchrony were believed to influence mothers' tendency to use more unsupportive reactions to children's negative emotions, which in turn would predict poorer emotion regulation and social skills in children.

In contrast, the second model was a moderation model that predicted the quality of the mother-child relationship would moderate the link between maternal reactions to children's negative emotions and children's emotion regulation and social skills. A moderator is a variable that affects the direction or strength of a link between the independent and dependent variables (Baron & Kenny, 1986). Therefore, the hypothesized moderation model suggests that the effect of mothers' reactions to children's negative emotions on children's emotion regulation and social skills varies depending on the quality of the mother-child relationship (i.e., interactional synchrony). Specifically, it was expected that unsupportive maternal reactions to negative emotions would be more harmful for children's development of emotion regulation and social skills if the quality of the relationship is also poor (i.e., lower interactional synchrony levels), and that unsupportive maternal reactions would have less of a negative effect on child outcomes if the quality of the relationship is positive (i.e., higher interactional synchrony levels). In contrast, it was expected that supportive maternal reactions to children's negative emotions would have a stronger positive effect on children's development of emotion regulation and social skills if the quality of the mother-child relationship was also positive, and that their positive effect would be weakened if the quality of the mother-child relationship was more negative.

CHAPTER II

Method

Participants

Participants were recruited to take part in a larger study investigating the psychosocial correlates of young children's social skills (Principal Investigator: Dr. Rosanne Menna; Grant # 807374, University of Windsor Social Sciences and Humanities Grant). The sample was recruited from the Windsor community using multiple methods, including the use of community agencies, the Psychology Department Participant Pool, word of mouth, and advertisements in a local parenting website, in a parenting magazine, and in local newspapers/newsletters. Children who were eligible to participate were between 3 and 6 years old, could speak English, had not been diagnosed with a pervasive developmental disorder or a developmental delay, and did not exhibit cognitive deficits during the testing done in this study (standard scores below 80 on the measure of cognitive functioning). Participants were 154 preschool-aged children (3-6 years) and their mothers. After data was removed for participants who did not meet study eligibility criteria (see Results: Data Screening and Preparation section for details), the final sample consisted of 136 mother-child pairs. Based on an a priori power analysis using G*Power 3.1.3 (Faul, Erdfelder, Buchner, & Lang, 2009), this provided a sample large enough to detect a medium effect size ($f^2 = .15$; Cohen, 1992), with a desired statistical power level of .8 with up to five independent variables in the regression equations.

Children ranged in age from 3 to 6 years ($M = 58.54$ months, $SD = 10.69$). Of the 136 participants, 80 were male and 56 were female. Male and female children did not significantly differ in age, $t(134) = -.21$, $p = .83$. Most of the children attended school or day care (92%). The children were predominantly from two parent homes (91.9%).

Those from single parent homes all lived primarily with their mothers at the time of participation.

Mothers in the sample ranged in age from 24 to 52 years ($M = 35.52$ years, $SD = 5.19$). Most of the mothers were married or had common-law status, while 10 reported being divorced or separated. The majority of mothers were Caucasian (78.7%). Most of the mothers had graduated from college or university (77.3%), and only 1 mother had not graduated from high school. Household income was normally distributed within the sample, with 62.3% reporting a family income of at least \$61,000. Demographic information for the children and mothers who participated in the current study is summarized in Table 1.

Measures

Cognitive ability. The Kaufman Brief Intelligence Test- Second Edition (KBIT-2; Kaufman & Kaufman, 1997) was used to assess child participants' cognitive abilities. The KBIT-2 is a brief individually administered measure of intelligence for individuals age 4 through 90 years. It consists of three subtests and provides a measure of verbal, nonverbal, and overall IQ scores. Two subtests compose the verbal IQ score: Verbal Knowledge and Riddles. On the Verbal Knowledge subtest children are shown an array of pictures and are asked to point to the picture that matches the word given by the examiner. This subtest serves as a measure of vocabulary and range of general information. The Riddles subtest requires the children to solve riddles by pointing to a picture within an array of pictures that shows the correct answer or by saying a single word that answers the riddle. The Riddles subtest measures verbal comprehension, vocabulary knowledge, and reasoning. The Matrices subtest requires children to choose a picture that matches with the stimulus picture for that item the best (e.g., a pillow goes

Table 1

Demographic Characteristics of Sample

| | <i>N</i> | <i>%</i> |
|---|----------|----------|
| Child Gender (<i>N</i> = 136) | | |
| Male | 80 | 58.8 |
| Female | 56 | 41.2 |
| Child Age (<i>N</i> = 136) | | |
| 3 years | 17 | 12.5 |
| 4 years | 59 | 43.4 |
| 5 years | 39 | 28.7 |
| 6 years | 21 | 15.4 |
| Child's Grade (<i>N</i> = 135) | | |
| Preschool or Daycare | 29 | 21.3 |
| Junior Kindergarten | 46 | 33.8 |
| Senior Kindergarten | 39 | 28.7 |
| Grade 1 | 11 | 8.1 |
| Not in School | 10 | 7.3 |
| Missing Data | 1 | 0.7 |
| Marital Status (<i>N</i> = 135) | | |
| Married | 117 | 86.0 |
| Common-Law Status | 8 | 5.9 |
| Divorced or Separated | 10 | 7.4 |
| Missing Data | 1 | 0.7 |
| Family Structure (<i>N</i> = 133) | | |
| Single Parent Home | 15 | 11.0 |
| Two Parent Home | 118 | 86.8 |
| Missing Data | 3 | 2.2 |
| Mother's Ethnicity (<i>N</i> = 136) | | |
| Caucasian | 107 | 78.7 |
| South Asian | 6 | 4.4 |
| East Asian | 4 | 2.9 |
| African Canadian | 1 | 0.7 |
| Hispanic | 1 | 0.7 |
| Native Canadian | 5 | 3.7 |
| Biracial | 3 | 2.2 |
| Arabic | 1 | 0.7 |
| Other | 8 | 5.9 |
| Mother's Education (<i>N</i> = 136) | | |
| Some High School | 1 | 0.7 |
| Graduated High School | 6 | 4.4 |
| Some College or University | 24 | 17.6 |
| Graduated College or University | 78 | 57.4 |
| Completed Graduate or Professional School | 27 | 19.9 |

Table 1 Continued

| | <i>N</i> | % |
|------------------------------------|----------|------|
| Household Income (<i>N</i> = 131) | | |
| Below \$30,000 | 17 | 12.5 |
| \$30,000 to \$60,000 | 29 | 21.3 |
| \$61,000 to \$100,000 | 38 | 27.9 |
| \$101,000 to \$150,000 | 33 | 24.3 |
| \$151,000 to \$250,000 | 13 | 9.6 |
| Above \$250,000 | 1 | 0.7 |
| Missing Data | 5 | 3.7 |

with a bed). The Matrices subtest measures the child's ability to understand relationships among the stimuli and it is used to compute the child's nonverbal IQ score. Children's raw scores on these three subtests are compared to a set of age- and gender-based norms to compute standard scores. Both the standard scores and the IQ composites have a mean of 100 and a standard deviation of 15.

The KBIT-2 has been shown to have adequate reliability and validity. Internal-consistency coefficients for the IQ scores are high, ranging from .86 to .96 for the Verbal score and from .78 to .93 for the Nonverbal score (Kaufman & Kaufman, 1997). Test-retest reliabilities are high for the Verbal IQ score, ranging from .88 to .93, and are good for the Nonverbal IQ score, ranging from .76 to .89 (Kaufman & Kaufman, 1997). The validity of the KBIT-2 as a measure of crystallized (Verbal score) and fluid/visual (Nonverbal score) abilities and of general intelligence (IQ composite score) has been supported through multiple sources of testing (Kaufman & Kaufman, 1997).

The three-year-old participants, who were too young to complete the K-BIT, completed two subtests of the Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III; Wechsler, 2002). The WPPSI-III is an individually administered clinical instrument used to assess intelligence of children as young as three years old. The two subtests were Information and Object Assembly. The Information subtest contains 34 items in which the child is asked to answer questions that draw on their broad range of general knowledge. This subtest is designed to measure the child's ability to acquire, retain, and retrieve general factual information. The Object Assembly subtest contains 14 items in which the child is asked to arrange puzzle pieces to form a meaningful whole within 90 seconds. This subtest is designed to assess visual-perceptual organization and nonverbal reasoning. These two subtests were chosen because they are

believed to be highly predictive of children's global verbal and nonverbal skills (Weschler, 2002).

The WPPSI-III has been shown to have adequate reliability and validity. Internal consistency reliability coefficients of .91 for the Information subtest and .87 for the Object Assembly subtest have been found (Weschler, 2002). In addition, test-retest stability coefficients of .89 for Information and .77 for Object Assembly also have been recorded (Weschler, 2002). The WPPSI-III also has strong content validity, internal structure, convergent validity, and discriminant validity (Weschler, 2002).

Background information. Mothers filled out a demographic questionnaire that included the following information: age, marital status, family structure, household income, ethnicity, education, and their child's age, gender, education, and psychological and medical history. The demographic questionnaire is contained in Appendix A.

Maternal emotion socialization. Mothers completed the Coping with Children's Negative Emotions Scale (CCNES; Fabes et al., 1990) to assess their typical reactions to their children's expression of negative emotions. Twelve scenarios in which the child displays a negative emotion (anger, fear, nervousness, sadness, embarrassment, annoyance, disappointment, and anxiety) are presented, and for each scenario the mother rates how likely she is to respond in six different ways. The response scale for each item is a 7-point scale ranging from 1 (*very unlikely*) to 7 (*very likely*) showing how likely the mother is to react in the way that each item describes. For each scenario, the mother is presented with reactions that fit into six categories of parental responding that are typically found in the emotion socialization literature: distress reactions (e.g., get angry at my child), punitive reactions (e.g., send my child to his/her room to cool off), expressive encouragement (e.g., encourage my child to express his/her feelings of anger and

frustration), emotion-focused reactions (e.g., comfort my child and try to get him/her to forget about the accident), problem-focused reactions (e.g., help my child figure out how to get the bike fixed), and minimizing reactions (e.g., tell my child that he/she is overreacting).

Research has shown the CCNES to have adequate internal consistency (ranged from $\alpha = .69$ for the punitive reactions subscale to $\alpha = .85$ for the expressive encouragement subscale) and test-retest reliability (ranged from $r = .56$ for the expressive encouragement subscale to $r = .83$ for the punitive reactions subscale, with $p < .01$ for all subscales; Fabes et al., 2002). Data from the present study also support the internal consistency of the CCNES scales (Distress Reaction $\alpha = .59$, Punitive Reactions $\alpha = .70$, Expressive Encouragement Reaction $\alpha = .88$, Emotion-Focused Reactions $\alpha = .79$, Problem-Focused Reactions $\alpha = .62$, Minimizing Reactions $\alpha = .84$). Research also has supported the concurrent validity of the CCNES, with all three supportive subscales being significantly positively related to each other, and all three unsupportive reactions being significantly positively related to each other (Fabes et al., 2002). Fabes and colleagues (2002) supported the construct validity of the CCNES by showing correlations between its outcomes and several other parenting indexes meant to measure similar constructs, including the Interpersonal Reactivity Index (Davis, 1983), Parental Attitude Toward Children's Expressiveness Scale (Saarni, 1985), and Parental Control Scale (Greenberger, 1988).

Children's emotion regulation. The Emotional Control subscale of the Behaviour Rating Inventory of Executive Functioning (BRIEF; Gioia, Espy, & Isquith, 2003; Gioia, Isquith, Guy, & Kenworthy, 2000) was used to assess children's ability to modulate emotional responses. This subscale measures children's ability to control their

emotions. Children who score poorly on this subscale tend to be emotionally explosive or to have emotional lability. That is, they tend to have very strong emotional reactions to seemingly minor events. Two versions of the BRIEF were used.

The BRIEF-Preschool Version (BRIEF-P) was completed by mothers of children between the ages of three and five. The BRIEF-P is a standardized measure of executive functioning for children between the ages of 2 years and 5 years 11 months. It contains 62 items. Each item is in the form of a statement that describes children's behaviours, and mothers are asked to respond on a 3-point scale identifying how often each problem has been a problem for their child within the past six months (*never, sometimes, or often*). Mothers of the six-year-old children completed the BRIEF. The BRIEF is a standardized measure of executive functioning for individuals between the ages of 5 and 18 years. The BRIEF contains 86 items. The BRIEF also contains a list of statements that describes behaviours, and mothers are asked to respond on a 3-point scale identifying how often their child has had problems with the behaviours that are described within the past six months (*never, sometimes, or often*).

Both versions of the BRIEF have demonstrated adequate reliability and validity. The emotional control scale has been found to have good internal consistency ($\alpha = .86$ for the BRIEF-P, $\alpha = .89$ for the BRIEF) and test-retest reliability over an average interval of 4.5 weeks ($r = .87$ for the BRIEF-P, $r = .79$ for the BRIEF). Convergent validity of the BRIEF-P subscales was established through significant correlations with the behaviour scales of the ADHD Rating Scale-IV, Preschool Version (ADHD-IV-P; McGoey et al., 2000) and the Behaviour Assessment System for Children (BASC; Reynolds & Kamphaus, 1992). Convergent validity of the BRIEF subscales was established through

significant correlations with the ADHD-IV-P, the BASC, and the Conners' Rating Scale (CRS; Conners, 1989).

For the present study, raw score composites were calculated using common items between the two versions of the BRIEF. That is, the items included in the Emotional Control subscale for the BRIEF were compared to the items included in the Emotional Control subscale for the BRIEF-Preschool. Only the items that occurred in both versions were used to calculate an Emotional Control raw score. This was done to ensure that the Emotional Control scores for the 6-year-olds in this study were based on the same items as the 3- to 5-year-olds. Eight items were identical between the BRIEF and the BRIEF-Preschool; Appendix B contains a list of the corresponding emotional control items between the BRIEF and the BRIEF-Preschool. In the present study, Cronbach's alpha for the Emotional Control subscale was .90.

Children's social skills. The Social Skills Rating System (SSRS; Gresham & Elliot, 1990) is a standardized measure that assesses children's social skills. Two versions of the SSRS were used; the SSRS Parent Form Preschool Level was completed by mothers of the three- and four-year-old children and the SSRS Parent Form Elementary Level was completed by mothers of the five- and six-year-old children. Both versions of the SSRS contain statements about children's behaviours and ask the mothers to rate how often their child engages in each behaviour on a 3-point scale (*never, sometimes, or very often*). Responses are used to calculate scores for social skill subscales, including cooperation, assertion, responsibility, and self-control, as well as a total social skills score, each of which are compared to a normalized sample so that standard scores can be computed. Each social skills subscale contains 10 items. The cooperation subscale measures behaviours such as helping others, complying with rules

and directions, and sharing. The assertion subscale includes initiating behaviours, such as introducing oneself, asking others for information, and responding to others' actions. The responsibility subscale includes behaviours that show the child's ability to communicate with adults and show respect toward property or work. The self-control subscale includes behaviours that could occur in conflict situations, such as responding appropriately to teasing, as well as behaviours that could occur in non-conflict situations that require compromising and taking turns. The standardized score of the Total Social Skills scale also was used in select analyses of the present study. This composite was calculated by adding the raw scores for each of the four subscales, then comparing this raw composite score to a normative sample to create a standardized composite score.

Based on ratings of children made by a sample of 200 parents, the SSRS Preschool form has been shown to have adequate internal consistency (cooperation $\alpha = .81$, assertion $\alpha = .76$, responsibility $\alpha = .75$, self-control $\alpha = .83$, total social skills $\alpha = .90$; Gresham & Elliott, 1990). Based on ratings of children made by 1027 parents, the SSRS Elementary form has also been shown to have adequate internal consistency (cooperation $\alpha = .77$, assertion $\alpha = .74$, responsibility $\alpha = .65$, self-control $\alpha = .80$, total social skills $\alpha = .87$; Gresham & Elliott, 1990). Research on the SSRS Elementary form has also shown it to have adequate test-retest reliability after a time delay of four weeks (cooperation $r = .91$, assertion $r = .77$, responsibility $r = .84$, self-control $r = .77$, total social skills $r = .87$). The criterion-related validity of the SSRS Elementary form was supported by comparisons between the SSRS scales and scales of the Child Behaviour Checklist (Achenbach & Rescorla, 2000; 2001), each of which followed theoretically-based expectations. Specifically, the four SSRS subscales and the total social skills score were negatively correlated with the CBCL Externalizing and Internalizing problems

scales (Gresham & Elliot, 1990). The internal consistency of the SSRS Preschool form was supported with data from the present study (cooperation $\alpha = .71$, assertion $\alpha = .69$, responsibility $\alpha = .68$, self-control $\alpha = .77$, total social skills $\alpha = .84$), as was the internal consistency of the SSRS Elementary form (cooperation $\alpha = .75$, assertion $\alpha = .85$, responsibility $\alpha = .60$, self-control $\alpha = .85$, total social skills $\alpha = .89$).

Mother-child interactional synchrony. Videotapes of mother-child interactions were coded to assess the interactional synchrony in the parent-child relationship. Mothers and their children participated in a 10-minute free play task and a 10-minute structured teaching task. During the free play task the mother and child were given a bin full of standard age-appropriate toys and were instructed to play until the researcher returned. During the structured teaching task the mother and child were asked to construct several block designs. They were given a box of coloured blocks and were asked to complete a series of block designs that were likely to be too difficult for the children to complete on their own.

The researcher and three trained research assistants coded videotaped mother-child interactions using an interactional synchrony coding system designed by Mize and Pettit (1997) and adapted by Keown and Woodward (2002). The free play and structured teaching tasks described above were coded for levels of interactional synchrony for a total of 20 minutes of coded interaction time. The two interaction tasks were coded individually. Each interaction task was divided into 30 second segments that were then individually rated for the level of interactional synchrony that was exhibited on a 6-point scale ranging from zero to five. After each 30 second segment was coded over the course of the 10 minute interaction task, the ratings for each segment were averaged to create a total interactive synchrony rating for each interaction task.

Each segment was rated on a scale from zero to five. Each scale point is associated with specific anchors and explicit examples of behaviours that reflect gradations of interactional synchrony. A rating of zero was given when both the mother and child were in the room but they were engaged in different or parallel activities and there was no interaction occurring. A rating of one was given when the dyad interacted but they did not seem to be on the same wave-length and they did not have a shared focus. This interaction was considered to be asynchronous and disjointed. A rating of two was given when most of the interaction during the 30 second segment of time looked fairly synchronous, but there were one or more obvious miscues, such as one partner leading the interaction while the other follows (i.e., briefly unbalanced). A two was also given when the mother and child were playing with the same toys, but their focus of attention was mainly on the toys rather than on each other's affect and actions. A rating of three was given to dyads who were engaged in the same activity and had a joint focus, who were responsive to one another, and who had some balance in leading and following each other, but the balance was not perfect. A rating of four was given when the mother and child were engaged in the same activity and there was a considerable amount of balance and mutuality in following, leading, and responsiveness, as well as some eye contact and shared affect. A rating of five was given to partners who were engaged in the same activity, were mutually balanced in following and leading, were mutually responsive to one another, had equal responsibility for maintaining the play and interaction, and had shared affect and/or made eye contact and/or shared physical closeness for a fair amount of time. Thus, high ratings of interactional synchrony were given when the mother and child shared the same focus of attention, maintained the same topic, mirrored each other's affect, and were responsive to each other's cues. Low ratings

of interactional synchrony were given when the mother and child usually did not share a common focus, frequently changed topics abruptly, or when one or both partners ignored or were unresponsive or non-contingently responsive for many interaction sequences.

All coding was completed by the researcher and three research assistants who were blind to information about the participants whose interactions they coded. One research assistant was a Master's student in Child Clinical Psychology, and two raters were fourth year Psychology Honours undergraduate students. Training occurred in several stages. First, the research assistants were provided background information on interactional synchrony and were asked to review the coding manual. Detailed coding forms were provided to each coder, along with the coding manual. These forms contained clear and concise descriptions of the specific anchors and behaviours that reflect each of the six scale points. Second, all of the coders met in a group to discuss and further clarify the concept of interactional synchrony and to provide the research assistants an opportunity to ask any questions that had about the coding system manual. During this discussion, three video tapes were randomly selected from the sample and were viewed in segments to further orient the research assistants to the nature of the interactions and to allow all of the coders to practice applying the interactional synchrony coding scheme together while discussing any discrepancies in their ratings. Following this, the coders coded one videotape separately, and then gathered to discuss their ratings until they came to an agreement on any discrepancies in their ratings. Initially, interrater agreement on the total synchrony score, defined as total scores that were within 0.5 of each other, was 50%. With discussion, interrater agreement between all coders reached 100%. All coders then coded two videotapes separately, and then gathered to discuss their ratings until they came to an agreement on any discrepancies in their ratings. This

occurred four times, for a total of eight coded videos. Initially, interrater agreement on the total synchrony scores ranged from 75% to 88%. With discussion, interrater agreement between all coders reached 100% for all eight videos. Once initial interrater agreement consistently exceeded 80% and discussion of coding discrepancies no longer revealed new concerns, questions, or disagreements, training was considered complete. In total, nine video interactions were used for training.

Previous studies have shown support for the validity and reliability of this coding scheme (e.g., Keown & Woodward, 2002; Mize & Pettit, 1997). The coding scheme has exhibited substantial levels of interrater reliability in past research, ranging from .66 (Keown & Woodward, 2002) to .75 (Mize & Pettit, 1997). Intraclass reliability correlations above .55 are believed to be adequate for these types of data (Mitchell, 1979). In the present study, interrater reliability for the interactional synchrony coding manual was calculated on the basis of 20% of the coded mother-child interactions. These interactions were randomly selected. However, it was ensured that an equal number of comparisons was made between each of the four coders, and an equal number of structured block tasks and free play tasks were included in the interrater reliability sample. An interrater agreement of 69% was achieved for the total interactional synchrony score. To control for chance agreement, intraclass correlations were computed between each of the four coders. The coding scheme exhibited strong interrater reliability, ranging from .79 to .92 between each of the four coders in this study.

A summary of parent and child measures, along with the specific scales of these measures that were used in analyses and their associated variables for the present study are presented in Table 2.

Table 2.

Summary of Study Variables and Measures

| Variables | Measures |
|--------------------------------------|-------------------------|
| Maternal Emotion Socialization | CCNES |
| Minimizing responses | |
| Punishing responses | |
| Personal distress responses | |
| Problem-focused responses | |
| Emotion-focused responses | |
| Expressive encouragement | |
| Children's Emotion Regulation | BRIEF |
| Children's Social Skills | SSRS |
| Assertion | |
| Cooperation | |
| Responsibility | |
| Self-Control | |
| Quality of Parent-Child Relationship | IS in a free play task |
| | IS in a structured task |

Procedure

This project was approved by the Research Ethics Board at the University of Windsor. Interested participants were contacted by phone or e-mail, at which time they were provided with information about the study and were scheduled for two appointments. Children and their mothers visited a lab at the University of Windsor, Department of Psychology, on two occasions for approximately one and one half hours each time. Most participants completed both sessions within a two week period. The order of the tasks that the children and parents completed was randomized across and within each visit, with the exception that the consent forms and videotaped interactions always occurred in the first visit. Parents completed consent forms and assent was obtained from each child. Half-way through each session, the children were given a break and were provided with a small snack and a juice box.

During the first visit, the mother-child dyads engaged in videotaped interaction tasks. Three interaction tasks were completed: a five minute warm-up task, a 10 minute free play task, and a 10 minute structured block task. The order of the tasks was randomly assigned and counterbalanced, with the exception that that the warm-up task always occurred first. During each of the interaction tasks, the mother and child sat kitty-corner to each other at a table. One video camera was positioned in the corner of the room on a tripod facing the mother and child. A researcher was in a separate room watching through a one-way mirror to ensure that there were no problems.

The warm-up task served as time for the mother and child to become comfortable with the video camera, the setting, and the situation while they played with a small selection of toys. The structured block task required the mother and child to construct several block designs. The mother and child were given a box full of 1 inch by 1 inch

coloured blocks and four cards with pictures of block designs that were likely to be too difficult for the children to complete on their own. The researcher asked the mother to, “Please first build a tower of nine blocks, then a bridge with three blocks, then have (child’s name) make a design with the blocks that matches the design on the cards.”

The free play task required the mother and child to play together with a selection of common toys. The dyad was given a bin full of standard age-appropriate toys (e.g., cars, building blocks, a castle, Play-doh, Mr. Potato Head, dinosaurs, ponies, a pop-up book, fire truck, etc.) that were placed on the floor between the mother and the child. The researcher told the mother, “This is a free play time with your child. You or (child’s name) can choose the toys you would like to play with together.”

Following the three interaction tasks, children completed a series of activities with the researcher (e.g., the cognitive battery) while the mother of each child was given questionnaires to fill out in a separate waiting area. The order of the questionnaires was randomly assigned. Each mother was given ten dollars cash to cover transportation costs (e.g., parking) and a five dollar gift certificate to a popular coffee chain. Participants who enrolled in the study through the University of Windsor Participant Pool (17% of the total sample) also were given bonus credit points toward their courses. Children were given a snack during a break in testing and a small prize (e.g., stickers, colouring books, toy) at the end of each visit.

CHAPTER III

Results

Planned Analyses

All statistical analyses, including data screening, data preparation, correlations, and regressions analyses, were completed using Predictive Analytics SoftWare Statistics, Version 20 (PASW 20). Bivariate correlations were used to assess relations between all independent, dependent, and potential covariate variables. Hierarchical regression analyses were used to assess the relation between maternal reactions to children's negative emotions and children's emotion regulation and social skills, and between children's emotion regulation skills and social skills.

Procedures designed by Preacher and Hayes (e.g., Preacher & Hayes, 2004; Hayes, 2009) and Process Macro provided by Hayes (2012) were used to examine the hypothesized mediation models. Hayes' bootstrapping macro uses bootstrapping to simultaneously complete each step of Baron and Kenny's (1986) suggested steps of mediation analyses. Bootstrapping constructs numerous re-samples of the data (specified at 5000 for the present study) using random samples with replacement (Hayes, 2009). As a result, this method reduces error associated with testing mediation models in small samples or samples in which the normality assumption is violated. For example, Hayes' bootstrapping macro does not assume normality of the indirect effect (path a * path b), which is commonly violated in smaller samples. The mediation models tested whether children's emotion regulation skills mediated the link between maternal reactions to children's negative emotions and children's social skills, and whether maternal reactions to children's negative emotions mediated the link between interactional synchrony during mother-child interactions and children's emotion regulation and social skills.

Baron and Kenny's (1986) procedure for testing moderation models using a series of multiple regressions with interaction terms included as a predictor variable was also used. The moderation models tested whether interactional synchrony moderated the link between maternal reactions to children's negative emotions and children's emotion regulation and social skills. The criterion for significance was set at an alpha level of .05 for all analyses.

Data Screening and Preparation

Prior to conducting the primary analyses, all demographic, independent, and dependent variables were examined for data entry errors, missing data, and violation of the study inclusion criteria. Participants were excluded from primary analyses if they did not speak English, had been diagnosed with a Pervasive Developmental Disorder or a Developmental Delay, or had cognitive deficits. One participant was removed from analyses due to lack of English proficiency that prevented him from being able to complete the test battery. Four participants were removed from analyses due to diagnosed Pervasive Developmental Disorders or serious cognitive delays (i.e., diagnosed Fetal Alcohol Syndrome). After all participants who did not meet eligibility criteria were removed, the dataset was reduced from 154 to 149. Participants who completed 50% or less of the test battery were removed from the sample. As a result, 13 cases were deleted, which reduced the sample from 149 to 136.

The measures that were used to compute an independent or dependent variable were examined for missing item responses. Little's MCAR chi-square statistic was found to be non-significant for all measures, including the CCNES, $X^2(497) = 452.87, p = .92$, Interactional Synchrony, $X^2(2) = 4.80, p = .09$, the SSRS, $X^2(1205) = 995.87, p = .99$, and the BRIEF, $X^2(1171) = 867.86, p = .99$, which suggests that data were missing in a

random manner. When subscales were missing individual item responses for a participant, case mean substitution was used. That is, missing values for items that comprised a subscale were replaced with the mean of the individual participant's responses to the other items that comprised that subscale. El-Masri and Fox-Wasylyshyn (2005) suggest that case mean substitution is ideal for missing data in psychometric measures because these measures are constructed so that each item within a subscale is highly correlated with the remaining items in that subscale. The primary advantage of this method is that it uses data provided by the individual to estimate missing data for that individual, rather than using data provided by the other participants (El-Masri & Fox-Wasylyshyn, 2005). Further, Downey and King (1998) revealed that case mean substitution is a robust imputation technique for psychometric data in which less than 30% of the data is missing; therefore, this technique was used for participants who were missing less than 30% of their data on a target subscale of the BRIEF, SSRS, or CCNES. Participants missing more than 30% of their data on a subscale (e.g., those who did not complete one of the questionnaires) were not included in analyses examining that variable. The BRIEF was missing data for 9 percent (N=13) of participants, the SSRS was missing data for 4 percent (N = 5) of participants, the CCNES was missing data for 11 percent (N =15) of participants, and 2 percent (N =3) of the participant dyads did not have interactional synchrony data.

The assumptions of multivariate normality, absence of outliers, linearity, and homoscedasticity were examined. Outliers on the dependent or independent variables can cause the regression model to be biased because they affect the regression coefficients (Field, 2005). The predictor variables were examined for outliers by inspecting Hat's Element (Leverage Values) using the formula recommended by Field (2005) for

determining the appropriate cut-off for each predictor variable within each regression equation that was used in the primary analyses, three times the value of $(k+1)/n$. One outlier (from different participants) was found on each of the following variables: CCNES Distress Reactions, CCNES Expressive Encouragement Reactions, BRIEF Emotional Control, Interactional Synchrony in the Free Play task, and Interactional Synchrony in the Structured Block task. Two outliers were found on the CCNES Minimization Reactions variable and three outliers were found on the CCNES Punitive Reactions variable. To reduce the risk associated with outliers on the predictor variables, the independent variables were Winsorized, meaning that any data points that were too extreme to have likely come from the target population (i.e., outliers) were re-coded to fit just within the acceptable data range limits. This method allows the outlier data point to remain in the data set and they retain their placement in the top or bottom portion of the distribution, but they are adjusted so that they fit within the normal distribution to remove their status as an outlier.

Outliers on the dependent variables were sought out by checking the standardized residuals for each variable using the recommended cut-off of 2.5. One outlier was found on each of the SSRS Assertion and SSRS Cooperation scales. To eliminate risks of analyses performed on variables with outliers, these data points were Winsorized. Next, the data set was examined for influential observations, which are defined as individual cases that have an undue influence over the parameters of the regression model (Field, 2005). The data set was examined for influential cases using Cook's Distance with the commonly suggested cut-off of 1. The data set did not include any influential cases.

The assumption of multicollinearity was checked by examining a correlation matrix of the predictor variables and by examining Tolerance (cutoff = 0.1), VIF (cutoff =

10), and Conditioning Index values (cutoff = 0.3). No issues were found with any of these methods; thus the assumption of multicollinearity was met. The assumptions of linearity and homoscedasticity were checked by examining scatterplots of the predicted outcome values and standardized residual values. The spread of the data within the scatterplots did not form a curved shape, suggesting that the assumption of linearity was met. None of the scatterplots showed a pattern in which the spread of the data points was wider on one end than the other, meaning that the assumption of homoscedasticity was met. The independence of errors assumption was checked using the Durbin-Watson statistic. All of the Durbin-Watson values were close to two (i.e., none fell outside of the one to three range), suggesting that this assumption was met.

The assumption of normally distributed errors was checked by creating histograms of the standardized residuals (i.e., errors) and looking for a normal distribution. The distributions of the errors were approximately normal for all variables. Finally, the assumption of normally distributed dependent variables was tested by examining histograms and skewness and kurtosis statistics. Kline (1998) suggested that skewness statistics larger than positive or negative 3 represent “extremely skewed distributions” and that kurtosis values over 10 should be avoided. For the current data, skewness values larger than 2 were considered non-normal because the elimination of any non-normal distributions was desired, rather than only the elimination of extremely skewed distributions. No issues related to the normal distribution of the dependent variables were found.

Preliminary Analyses

Means, standard deviations, and ranges for each study variable are shown in Table 3. Bivariate correlations and *t*-tests were conducted to evaluate the relation between demographic variables and the independent, dependent, and mediator variables to clarify the characteristics of the sample and to identify possible covariates for the primary analyses. A summary of these correlations can be found in Table 4. Child age was significantly negatively correlated with maternal punitive reactions to children's negative emotions. However, a follow-up ANOVA did not reveal significant differences in the frequency with which punitive reactions were used for 3, 4, 5, and 6 year olds, $F(3, 117) = 2.57, p = .06$.

Child age was also significantly negatively correlated with interactional synchrony in the free play task and was positively correlated with interactional synchrony in the structured block task. That is, older children exhibited greater synchrony in their interactions with their mothers during the structured teaching task compared to younger children, but older children's synchrony during an unstructured free play task was worse than younger children's. Child age was also significantly negatively correlated with children's cooperation skills, self-control skills, and overall social skills, revealing that older children in this sample exhibited fewer of these social skills than younger children in this sample.

Child gender was significantly negatively correlated with maternal expressive encouragement reactions to children's negative emotions, and was significantly positively correlated with maternal punishing and minimizing reactions. *T*-tests were used to explore

Table 3

Mean, Standard Deviation, and Range of Variables for the Total Sample

| Measure | <i>N</i> | <i>M</i> | <i>SD</i> | <i>Min.</i> | <i>Max.</i> |
|--------------------------|----------|----------|-----------|-------------|-------------|
| CCNES | | | | | |
| Punitive | 121 | 2.09 | 0.53 | 1.08 | 3.33 |
| Minimizing | 121 | 2.27 | 0.83 | 1.00 | 4.50 |
| Personal Distress | 121 | 2.57 | 0.63 | 1.17 | 4.00 |
| Expressive Encouragement | 121 | 5.31 | 0.98 | 2.92 | 7.00 |
| Problem-Focused | 121 | 5.90 | 0.54 | 4.08 | 7.00 |
| Emotion-Focused | 121 | 5.80 | 0.76 | 2.67 | 7.00 |
| BRIEF Emotional Control | 123 | 13.96 | 3.98 | 8.00 | 24.00 |
| SSRS | | | | | |
| Cooperation | 131 | 12.81 | 3.27 | 5.00 | 19.00 |
| Assertion | 131 | 14.76 | 2.99 | 7.00 | 21.00 |
| Responsibility | 131 | 11.75 | 3.23 | 3.00 | 18.00 |
| Self-Control | 131 | 12.62 | 3.52 | 4.00 | 20.00 |
| Total Social Skills | 131 | 100.94 | 15.57 | 67.00 | 130.00 |
| Interactional Synchrony | | | | | |
| Free Play Task | 133 | 2.45 | 0.50 | 1.10 | 3.60 |
| Structured Block Task | 133 | 2.30 | 0.39 | 1.25 | 3.05 |

Table 4

Correlations Among Study Variables and Demographic Characteristics

| | Child Age | Child Gender | Maternal Education | Family Income | Family Structure |
|--------------------------------|-----------|--------------|--------------------|---------------|------------------|
| CCNES | | | | | |
| Punitive | -.22** | .21* | -.39*** | -.12 | -.21* |
| Minimizing | .08 | .16* | -.20* | -.22** | -.30*** |
| Personal Distress | -.07 | .04 | -.20* | -.10 | -.15 |
| Expressive Encouragement | .01 | -.23** | .05 | -.07 | .11 |
| Problem-Focused | .11 | -.01 | .30*** | -.07 | .03 |
| Emotion-Focused | .08 | -.11 | .12 | -.03 | .00 |
| BRIEF Emotional Control | .08 | -.11 | -.20* | -.08 | -.23* |
| SSRS | | | | | |
| Cooperation | -.18* | .06 | .02 | -.08 | .24** |
| Assertion | .10 | .02 | .08 | .18* | .11 |
| Responsibility | .13 | .12 | -.14 | -.01 | .05 |
| Self-Control | -.17* | .20* | .08 | .14 | .23** |
| Total Social Skills | -.16* | -.05 | .07 | .14 | .23** |
| Interactional Synchrony | | | | | |
| Free Play Task | -.16* | .07 | .05 | .21** | .18* |
| Structured Block Task | .16* | -.04 | .02 | .16* | -.05 |

Note. *N* ranged from 117 to 133.

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

these relations. It was found that male children ($M = 5.50, SD = 0.92$) were encouraged to express their emotions more than female children ($M = 5.05, SD = 1.02$), $t(119) = 2.53, p = .01$. In addition, mothers reacted to girls' ($M = 2.23, SD = 0.51$) negative emotions in a punitive manner more than they did to boys' ($M = 2.00, SD = 0.53$) negative emotions, $t(119) = -2.31, p = .02$. A t -test revealed that there was not a significant difference between how likely mothers were to use minimizing reactions in response to their female ($M = 2.42, SD = 0.81$) and male ($M = 2.15, SD = 0.84$) children's negative emotions, $t(119) = -1.75, p = .08$. Child gender was also significantly positively correlated with children's self-control skills. A t -test revealed that female children ($M = 13.44, SD = 2.89$) exhibited more self-control skills than male children ($M = 12.03, SD = 3.82$), $t(128.74) = -2.41, p = .02$.

Mothers' level of education was negatively correlated with punitive, personal distress, and minimizing reactions to children's negative emotions. That is, mothers with lower levels of education tended to react to their children's negative emotions with more punitive reactions, minimizing reactions, and personal distress. In addition, mothers' level of education was significantly positively correlated with problem-focused reactions, revealing that mothers with more years of education tended to react to children's negative emotions with more problem-focused reactions. Mothers' level of education also was significantly negatively correlated with children's emotion regulation difficulties, revealing that mothers with higher levels of education tended to have children who exhibited fewer emotion regulation difficulties.

Family income was significantly negatively correlated with minimizing reactions to children's negative emotions. That is, mothers from families with higher annual incomes used fewer minimizing reactions to children's negative emotions. Family

income also was significantly positively correlated with interactional synchrony in the free play task and the structured block task, revealing that mothers and children from families with higher annual incomes had higher levels of interactional synchrony during unstructured and structured tasks. Family income also was significantly positively correlated with children's assertion skills. Children from families with higher annual incomes exhibited greater assertion skills.

Family structure was significantly correlated with mothers' minimizing and punitive reactions to children's negative emotions, with interactional synchrony in the free play task, and with children's cooperation skills, self-control skills, total social skills, and emotion regulation skills. *T*-tests were used to further explore these associations. Analyses revealed that mothers who were single parents ($M = 3.00$, $SD = 0.95$) used significantly more minimizing reactions when their children expressed negative emotions than mothers from two parent homes ($M = 2.18$, $SD = 0.77$), $t(117) = 3.44$, $p = .001$. However, a *t*-test revealed that mothers' tendency to use punishing reactions did not significantly differ between mothers who were single parents ($M = 2.42$, $SD = 0.70$) and mothers from two parent homes ($M = 2.05$, $SD = 0.49$), $t(12.25) = 1.76$, $p = .10$. Interactional synchrony during the free play task was shown to be higher between mothers and children in two parent homes ($M = 2.48$, $SD = 0.48$) than between mothers and children from single parent homes ($M = 2.21$, $SD = 0.60$), $t(129) = -2.01$, $p = .05$. Children from two parent homes ($M = 13.07$, $SD = 3.20$) were shown to exhibit more cooperation skills than those from single parent homes ($M = 10.42$, $SD = 3.29$), $t(126) = -2.73$, $p = .01$. Children from two parents homes ($M = 12.84$, $SD = 3.34$) also exhibited more self-control skills than children from single parent homes ($M = 10.08$, $SD = 3.80$), $t(126) = -2.68$, $p = .01$, and children from two parent homes ($M = 102.16$, $SD = 15.10$)

showed a higher degree of general social skills than those from single parent homes ($M = 89.40$, $SD = 15.08$), $t(119) = -2.56$, $p = .01$. However, analyses revealed that there was not a significant difference in children's emotion regulation skills between those from single parent ($M = 16.58$, $SD = 5.42$) and two parent homes ($M = 13.63$, $SD = 3.69$), $t(12.14) = 1.84$, $p = .09$.

Significant relations between demographic variables and the independent, dependent, and mediator variables were used to identify possible covariates for the primary analyses. Possible confounding demographic variables were controlled for in all hypothesis tests.

Main Analyses: Examination of Direct Effect Models

Bivariate correlations were performed to examine relations between all study variables. These correlations are presented in Table 5. The table contains comparisons between the two measures of interactional synchrony. Interactional synchrony levels in the two tasks (free play task and structured block task) were strongly correlated. Associations to outcome and predictor variables varied slightly between the free play task and the structured goal-oriented task. Interactional synchrony levels in both tasks were negatively associated with maternal minimizing reactions to children's negative emotions and were positively associated with children's assertion skills. However, synchrony in the free play task was negatively associated with maternal distress reactions to children's negative emotions and maternal punitive reactions to children's negative emotions, but synchrony in the structured block task was not significantly associated with these variables. Conversely, synchrony in the structured block task was negatively associated with maternal problem-focused reactions to children's negative emotions, but synchrony

Table 5

Inter-Correlations between Independent and Dependent Variables (n=136)

| Variable | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|-----------------------------------|-------|-------|--------|------|--------|-------|--------|--------|--------|--------|--------|-------|--------|
| 1. CCNES Distress Reaction | .34** | .34** | -.15 | .03 | -.14 | .29** | -.29** | -.14 | -.12 | -.12 | -.15 | -.08 | -.10 |
| 2. CCNES Minimizing Reaction | | .58** | -.31** | .08 | -.05 | .12 | -.27** | -.24** | -.36** | -.30** | -.32** | -.17* | -.19* |
| 3. CCNES Punitive Reaction | | | -.17* | -.13 | -.28** | .19* | -.19* | -.14 | -.20* | -.17* | -.17* | -.14 | -.09 |
| 4. CCNES Expressive Encouragement | | | | .13 | .34** | -.05 | .11 | -.06 | .28** | .24** | .27** | .12 | .06 |
| 5. CCNES Emotion-Focused Reaction | | | | | .45** | .03 | -.07 | -.13 | .03 | -.04 | .02 | .10 | .01 |
| 6. CCNES Problem-Focused Reaction | | | | | | -.05 | -.02 | -.18* | .09 | .03 | .08 | .13 | .17* |
| 7. BRIEF Emotional Control | | | | | | | .00 | .00 | -.47** | -.43** | -.31** | -.21* | -.52** |
| 8. IS Free Play Task | | | | | | | | .24** | .09 | -.01 | .20** | .11 | .14 |
| 9. IS Structured Block Task | | | | | | | | | .11 | .09 | .21** | .13 | .02 |
| 10. SSRS Total Social Skills | | | | | | | | | | .70** | .65** | .62** | .71** |
| 11. SSRS Cooperation | | | | | | | | | | | .31** | .28** | .44** |
| 12. SSRS Assertion | | | | | | | | | | | | .45** | .34** |
| 13. SSRS Responsibility | | | | | | | | | | | | | .28** |
| 14. SSRS Self-Control | | | | | | | | | | | | | |

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

in the free play task was not significantly associated with this variable. The relations between synchrony and the other study variables are further examined in hypothesis five.

Hypothesis #1: Associations between maternal reactions to children's negative emotions and children's emotion regulation skills. It was hypothesized that higher levels of supportive maternal reactions (i.e., emotion-focused, problem-focused, or expressive encouragement reactions) would predict lower levels of emotion regulation difficulties. As depicted in Table 5, emotion-focused, problem-focused, and expressive encouragement reactions were not related to children's emotion regulation difficulties (i.e., BRIEF Emotional Control scale); therefore, further analyses were not performed.

It was also hypothesized that higher levels of unsupportive maternal reactions (i.e., punishing, minimizing, or personal distress reactions) would predict greater emotion regulation difficulties. Consistent with this hypothesis, maternal personal distress reactions and punitive reactions were positively associated with children's emotion regulation difficulties, revealing that mothers who endorse more personal distress and punitive reactions have children who are not as skilled at controlling their emotions, express more negative emotions, and shift from one emotional state to another very quickly. Children's emotion regulation scores were also significantly correlated with family structure and mothers' education (see Table 4), suggesting that these demographic variables are potential confounds when predicting children's emotion regulation skills. A hierarchical regression analysis was completed to determine whether maternal personal distress reactions could significantly predict children's emotion regulation skills after controlling for family structure and mothers' education. As Table 6 shows, maternal

Table 6

Summary of the Hierarchical Regression Analysis for Predicting BRIEF Emotional Control with CCNES Personal Distress Reactions

| | <i>B</i> | <i>SE B</i> | β |
|----------------------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Structure | -2.10 | 1.25 | -0.16 |
| Mothers' Education | -0.71 | 0.52 | -0.13 |
| Step 2 | | | |
| Family Structure | -1.84 | 1.22 | -0.14 |
| Mothers' Education | -0.39 | 0.52 | -0.07 |
| CCNES personal distress reaction | 1.58 | 0.57 | 0.26* |

Note. $R^2=.05$, adjusted $R^2 = .03$ for step 1 ($p = .06$); $\Delta R^2 = .06$, adjusted $R^2 = .09$ for step 2 ($p = .01$). Higher scores on the BRIEF Emotional Control scale reflect greater emotion regulation difficulties.

* $p = .01$.

personal distress reactions to children's negative emotions accounted for a significant amount of variability in children's emotion regulation skills, over and above the variability accounted for by the family structure and mothers' education, showing that mothers who react to their children's negative emotions with personal distress tended to have children who exhibited more emotion regulation difficulties. The standardized beta weights show that as maternal personal distress reactions increased by one standard deviation, the children's emotion regulation deficits increased by 0.26 standard deviations.

A hierarchical regression analysis was completed to determine whether maternal punitive reactions could significantly predict children's emotion regulation skills after controlling for family structure and mothers' education. As Table 7 shows, maternal punishing reactions to children's negative emotions did not account for a significant amount of variability in children's emotion regulation deficits after family structure and mothers' education were included in the equation.

Mothers' minimizing reactions were not significantly correlated with children's emotion regulation skills, suggesting further analyses were not warranted.

Hypothesis #2: Associations between maternal reactions to children's negative emotions and children's social skills. It was hypothesized that unsupportive maternal reactions would predict lower levels of children's social skills. That is, children whose mothers engaged in more punishing, minimizing, and personal distress reactions were expected to display fewer cooperation, assertion, self-control, and responsibility behaviours. Consistent with this hypothesis, maternal minimizing reactions were negatively associated with children's cooperation skills, assertion skills, responsibility

Table 7

Summary of the Hierarchical Regression Analysis for Predicting BRIEF Emotional Control with CCNES Punitive Reactions

| | <i>B</i> | <i>SE B</i> | β |
|-------------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Structure | -2.10 | 1.25 | -0.16 |
| Mothers' Education | -0.71 | 0.52 | -0.13 |
| Step 2 | | | |
| Family Structure | -1.97 | 1.26 | -0.15 |
| Mothers' Education | -0.50 | 0.56 | -0.09 |
| CCNES punitive reaction | 0.83 | 0.75 | 0.11 |

Note. $R^2=.05$, adjusted $R^2 = .03$ for step 1 ($p = .06$); $\Delta R^2 = .01$, adjusted $R^2 = .03$ for step 2 ($p = .08$). Higher scores on the BRIEF Emotional Control scale reflect greater emotion regulation difficulties.

skills, self-control skills, and with the Total Social Skills scale. Mothers who endorsed more minimizing reactions had children who displayed fewer of all four types of social skills. In addition, maternal punitive reactions were negatively correlated with children's assertion skills and cooperation skills. In terms of relations with possible confounding factors, children's Total Social Skills composite, cooperation skills, and self-control skills were significantly correlated with family structure, children's assertion skills were significantly correlated with family income, children's self-control skills were significantly correlated with child's gender, and children's Total Social Skills composite, cooperation skills, and self-control skills were significantly correlated with child's age (see Table 4). These demographic variables were controlled for in the following hypothesis tests. Hierarchical regression analyses were used to further explore the relations between these variables.

A hierarchical regression analysis was completed to determine whether maternal minimizing reactions could significantly predict children's social skills after controlling for family structure and the child's age. Because maternal minimizing reactions correlated with all four social skills subscales and with the Total Social Skills composite scale, and because all five measures of children's social skills correlated highly with each other (see Table 5), one regression analysis was completed using the Total Social Skills composite scale as the outcome variable to reduce the risk of Type I error that would occur if all social skills subscales were tested separately. As Table 8 shows, maternal minimizing reactions to children's negative emotions accounted for a significant amount of variability in children's social skills, over and above the variability accounted for by the family structure, showing that mothers who react to their children's negative

Table 8

*Summary of the Hierarchical Regression Analysis for Predicting SSRS Total Social Skills**Composite with CCNES Minimizing Reactions*

| | <i>B</i> | <i>SE B</i> | β |
|----------------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Structure | 11.84 | 5.15 | 0.22* |
| Child Age | -0.18 | 0.14 | -0.12 |
| Step 2 | | | |
| Family Structure | 7.60 | 5.12 | 0.14 |
| Child Age | -0.15 | 0.13 | -0.10 |
| CCNES Minimizing Reactions | -5.72 | 1.80 | -0.29** |

Note. $R^2=.07$, adjusted $R^2 = .05$ for step 1 ($p = .02$); $\Delta R^2 = .08$, adjusted $R^2 = .13$ for step 2 ($p = .001$).

* $p = .02$. ** $p = .002$.

emotions by minimizing the child's emotional experience tended to have children who exhibited fewer social skills. The standardized beta weights show that as maternal minimizing reactions increased by one standard deviation, the children's social skills decreased by 0.29 standard deviations.

A hierarchical regression analysis was completed to determine whether maternal punishing reactions could significantly predict children's cooperation skills after controlling for family structure and the child's age. As Table 9 shows, maternal punishing reactions to children's negative emotions did not account for a significant amount of variability in children's cooperation skills after accounting for the family structure and child's age.

Another hierarchical regression analysis was completed to determine whether maternal punishing reactions could significantly predict children's assertion skills after controlling for family income. As Table 10 shows, maternal punishing reactions to children's negative emotions did not account for a significant amount of variability in children's assertion skills after accounting for family income.

Mothers' personal distress reactions were not significantly correlated with children's social skills. As such, further analyses examining the link between maternal reactions to children's negative emotions and children's social skills were not warranted. It was also hypothesized that supportive maternal reactions to children's negative emotions would predict higher levels of children's social skills. That is, children whose mothers engaged in more emotion-focused, problem-focused, and expressive encouragement reactions were expected to display more cooperation, assertion, self-control, and responsibility behaviours. Consistent with this hypothesis, maternal

Table 9

*Summary of the Hierarchical Regression Analysis for Predicting SSRS Cooperation**Skills with CCNES Punitive Reactions*

| | <i>B</i> | <i>SE B</i> | β |
|--------------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Structure | 2.61 | 1.00 | 0.22*** |
| Child Age | -0.05 | 0.03 | -0.16 |
| Step 2 | | | |
| Family Structure | 2.14 | 1.04 | 0.19* |
| Child Age | -0.06 | 0.03 | -0.20** |
| CCNES Punitive Reactions | -0.96 | 0.58 | -0.16 |

Note. $R^2=.09$, adjusted $R^2 = .08$ for step 1 ($p = .004$); $\Delta R^2 = .02$, adjusted $R^2 = .09$ for step 2 ($p = .003$).

* $p = .04$. ** $p = .03$. *** $p = .01$.

Table 10

Summary of the Hierarchical Regression Analysis for Predicting SSRS Assertion Skills with CCNES Punitive Reactions

| | <i>B</i> | <i>SE B</i> | β |
|--------------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Income | 0.51 | 0.23 | 0.20** |
| Step 2 | | | |
| Family Income | 0.46 | 0.23 | 0.18* |
| CCNES Punitive Reactions | -0.93 | 0.53 | -0.16 |

Note. $R^2=.04$, adjusted $R^2 = .03$ for step 1 ($p = .03$); $\Delta R^2 = .03$, adjusted $R^2 = .05$ for step 2 ($p = .02$).

* $p = .05$. ** $p = .03$

expressive encouragement reactions were positively correlated with children's cooperation and assertion skills, and maternal problem-focused reactions were positively correlated with children's self-control skills. Mothers who endorsed more expressive encouragement reactions had children who displayed more cooperation and assertion behaviours, and mothers who endorsed more problem-focused reactions had children who displayed more self-control skills. Hierarchical regression analyses were used to further examine the relations between these variables.

A hierarchical regression analysis was completed to determine whether maternal expressive encouragement reactions could significantly predict children's cooperation skills after controlling for family structure, child gender, and child age. As Table 11 shows, maternal expressive encouragement reactions to children's negative emotions accounted for a significant amount of variability in children's cooperation skills, over and above the variability accounted for by the family structure and the child's age and gender, showing that mothers who react to their children's negative emotions by encouraging them to express their emotions in a healthy way tended to have children who exhibited more cooperation behaviours. The standardized beta weights show that as maternal expressive encouragement reactions increased by one standard deviation, the children's cooperation skills increased by 0.22 standard deviations.

Another hierarchical regression analysis was completed to determine whether maternal expressive encouragement reactions would predict children's assertion skills after controlling for family income. As Table 12 shows, maternal expressive encouragement reactions to children's negative emotions accounted for a significant amount of variability in children's assertion skills, over and above the variability

Table 11

Summary of the Hierarchical Regression Analysis for Predicting SSRS Cooperation with CCNES Expressive Encouragement Reactions

| | <i>B</i> | <i>SE B</i> | β |
|--------------------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Structure | 2.61 | 1.01 | 0.23*** |
| Child Age | -0.05 | 0.03 | -0.16 |
| Child Gender | 0.02 | 0.59 | 0.00 |
| Step 2 | | | |
| Family Structure | 2.22 | 1.00 | 0.20* |
| Child Age | -0.05 | 0.03 | -0.16 |
| Child Gender | 0.35 | 0.59 | 0.05 |
| CCNES Expressive Encouragement | 0.75 | 0.31 | 0.22** |

Note. $R^2=.07$, adjusted $R^2 = .06$ for step 1 ($p = .005$); $\Delta R^2 = .04$, adjusted $R^2 = .09$ for step 2 ($p = .001$).

* $p = .03$. ** $p = .02$. *** $p = .01$.

Table 12

Summary of the Hierarchical Regression Analysis for Predicting SSRS Assertion with CCNES Expressive Encouragement Reactions

| | <i>B</i> | <i>SE B</i> | β |
|--------------------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Income | 0.51 | 0.23 | 0.20* |
| Step 2 | | | |
| Family Income | 0.56 | 0.22 | 0.22** |
| CCNES Expressive Encouragement | 0.94 | 0.28 | 0.30*** |

Note. $R^2=.04$, adjusted $R^2 = .03$ for step 1 ($p = .03$); $\Delta R^2 = .09$, adjusted $R^2 = .11$ for step 2 ($p < .00$).

* $p = .03$. ** $p = .01$. *** $p = .001$.

accounted for by family income, showing that mothers who react to their children's negative emotions by encouraging them to express their emotions in a healthy way tended to have children who exhibited more assertion behaviours. The standardized beta weights show that as maternal expressive encouragement reactions increased by one standard deviation, the children's assertion skills increased by 0.30 standard deviations.

A hierarchical regression analysis was completed to determine whether maternal problem-focused reactions would predict children's self-control skills after controlling for family structure and child's age and gender. As Table 13 shows, maternal problem-focused reactions to children's negative emotions did not account for a significant amount of variability in children's self-control skills after accounting for family structure and child's age and gender.

Mothers' emotion-focused reactions were not significantly correlated with children's social skills; therefore, further analyses were not conducted.

Hypothesis #3: Associations between children's emotion regulation and social skills. It was hypothesized that children's emotion regulation skills would predict their social skill levels. That is, children who had emotion regulation difficulties would exhibit fewer cooperation, assertion, responsibility, and self-control skills, and those with more developed emotion regulation abilities would exhibit more of these social skills. Consistent with this hypothesis, children's emotion regulation deficits were negatively associated with children's cooperation skills, assertion skills, responsibility skills, self-control skills, and with the Total Social Skills scale. Children who displayed more emotion regulation difficulties displayed fewer of all four types of social skills. Children's Total Social Skills composite, cooperation skills, and self-control skills also

Table 13

Summary of the Hierarchical Regression Analysis for Predicting SSRS Self-Control with CCNES Problem-Focused Reactions

| | <i>B</i> | <i>SE B</i> | β |
|-----------------------|----------|-------------|---------|
| Step 1 | | | |
| Family Structure | 2.38 | 1.07 | 0.20* |
| Child Age | -0.05 | 0.03 | -0.16 |
| Child Gender | 0.88 | 0.63 | 0.13 |
| Step 2 | | | |
| Family Structure | 2.29 | 1.06 | 0.19* |
| Child Age | -0.06 | 0.03 | -0.18 |
| Child Gender | 0.92 | 0.62 | 0.13 |
| CCNES Problem-Focused | 1.02 | 0.58 | 0.16 |

Note. $R^2 = .09$, adjusted $R^2 = .07$ for step 1 ($p = .01$); $\Delta R^2 = .02$, adjusted $R^2 = .09$ for step 2 ($p = .007$).

* $p = .03$.

were significantly correlated with family structure and mothers' education level (see Table 4), suggesting that these demographic variables are potential confounds when predicting social skills.

A hierarchical regression analysis was completed to determine whether children's emotion regulation skills could significantly predict children's social skills after controlling for family structure. Emotion regulation skills correlated with all four social skills subscales and with the Total Social Skills composite scale, and all five measures of children's social skills correlated highly with each other (see Table 5). Therefore, one regression analysis was completed using the Total Social Skills composite scale as the outcome variable to reduce the risk of Type I error that would occur if all social skills subscales were tested separately. As Table 14 shows, children's emotion regulation skills accounted for a significant amount of variability in children's social skills, over and above the variability accounted for by the family structure and mothers' education level, showing that children who displayed emotion regulation difficulties were more likely to exhibit poor social skills. The standardized beta weights show that as children's emotion regulation difficulties increased by one standard deviation, their social skills decreased by 0.45 standard deviations.

Main Analyses: Examination of Mediation and Moderation Models

Hypothesis #4: Investigating the mediating effect of emotion regulation on the relation between maternal reactions to children's negative emotions and children's social skills. It was hypothesized that the link between maternal reactions to children's negative emotions and children's social skills would be mediated by the children's emotion regulation skills. Figure 3 shows the structure of mediation models

Table 14

Summary of the Hierarchical Regression Analysis for Predicting SSRS Total Social Skills Composite with BRIEF Emotional Control

| | <i>B</i> | <i>SE B</i> | β |
|-------------------------|----------|-------------|----------|
| Step 1 | | | |
| Family Structure | 13.18 | 5.16 | 0.24** |
| Mother Education | -1.27 | 2.09 | -0.06 |
| Step 2 | | | |
| Family Structure | 10.00 | 4.66 | 0.18* |
| Mother Education | -2.86 | 1.90 | -0.13 |
| BRIEF Emotional Control | -1.81 | 0.34 | -0.45*** |

Note. $R^2=.06$, adjusted $R^2 = .04$ for step 1 ($p = .04$); $\Delta R^2 = .19$, adjusted $R^2 = .23$ for step 2 ($p < .00$). Higher scores on the BRIEF Emotional Control scale reflect greater emotion regulation difficulties.

* $p = .03$. ** $p = .01$. *** $p < .00$.

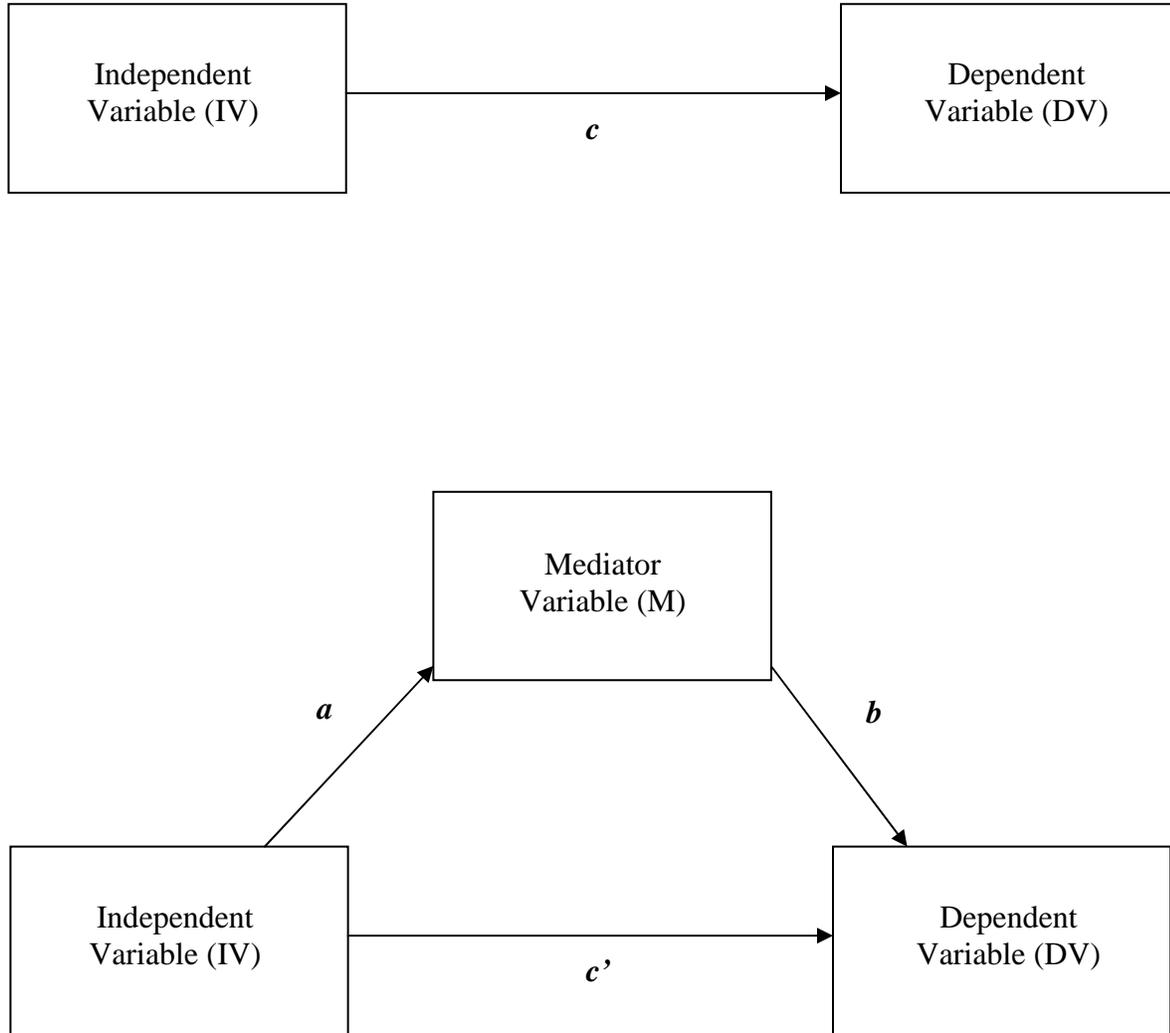


Figure 3. Mediation model depicting relations between variables

and Figure 4 shows the mediation model hypothesized in this study. As Figure 3 shows, mediation models test the significance of the indirect effect of the independent variable (IV) on the dependent variable (DV) through the mediator variable (M). That is, path c' represents the pure and direct effect of the IV on the DV, which is calculated as the difference between the total effect of the IV on the DV when M is not included in the analysis (c) and the indirect effect of the IV on the DV through M. In this study, a model is proposed in which the relation between maternal reactions to children's negative emotions and children's social skills is mediated by children's emotion regulation skills. This hypothesized mediation model is shown in Figure 4.

Possible mediation models were identified by examining the correlation matrix in Table 5 to examine relations between variables of interest. According to Preacher and Hayes (e.g., Hayes, 2009; Preacher & Hayes, 2004), four criteria must be met to support a mediation model. First, a significant relation must be shown between maternal reactions to children's negative emotions and children's emotion regulation skills (path a). The correlation matrix revealed significant links between maternal personal distress reactions and children's emotion regulation skills. Second, a significant relation must be shown between children's emotion regulation skills and children's social skills (path b). The correlation matrix revealed significant links between children's emotion regulation skills and their cooperation, assertion, responsibility, self-control, and total social skills. At this stage, a possible mediation model to test has been identified: children's emotion regulation skills are hypothesized to mediate the link between maternal personal distress reactions to children's negative emotions and children's total social skills. Bootstrapping macros are used to test each direct and indirect effect (path a, path b, path c, path c'), and

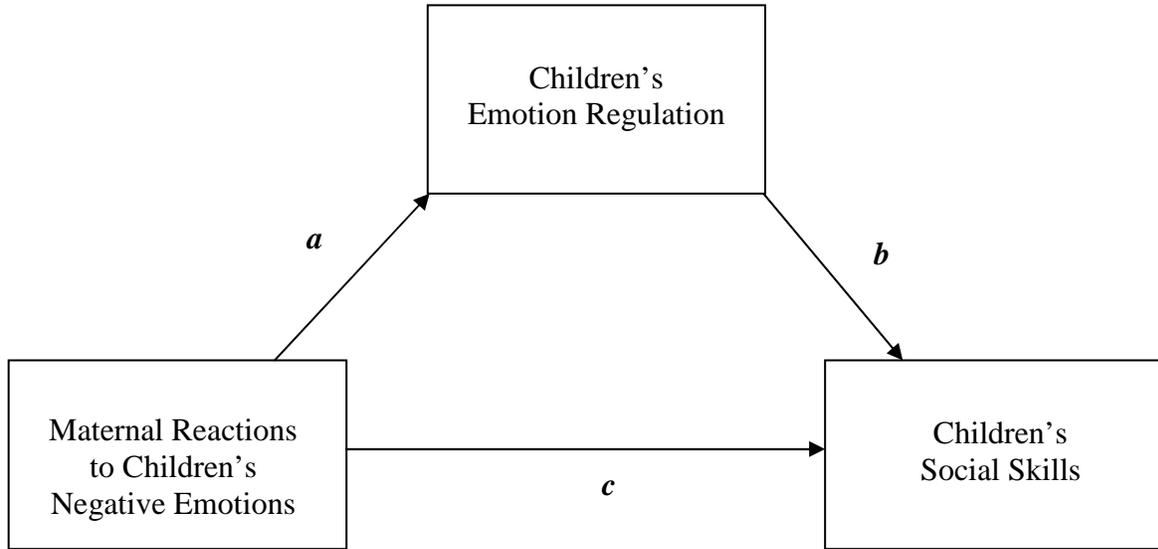


Figure 4. Hypothesis 4 mediation model depicting relations between maternal reactions to children's negative emotions, children's emotion regulation skills, and children's social skills

to test the significance of the indirect effect (path a * path b). Results revealed that maternal personal distress reactions significantly predicted children's emotion regulation skills ($B = 1.74$, $SE = 0.57$, $t = 3.07$, $p < .00$), children's emotion regulation skills significantly predicted children's social skills ($B = -1.89$, $SE = 0.36$, $t = -5.22$, $p < .00$), and the link between maternal personal distress reactions and children's social skills was non-significant when children's emotion regulation skills were controlled for ($B = 0.24$, $SE = 2.22$, $t = 0.11$, $p = .91$). However, the link between maternal personal distress reactions and children's social skills also was not significant ($B = -3.05$, $SE = 2.38$, $t = -1.28$, $p = .21$). This finding suggests that a mediational model is not supported, as there is no direct effect to be mediated; however, if the indirect effect (i.e., path a * path b) is significant, an indirect causation model would be supported in which maternal personal distress reactions affect children's emotion regulation skills, and in turn children's emotion regulation skills affect their social skills. Tests of the strength of the indirect effect revealed that the effect was significant (Lower 95% CI = -6.54, Upper 95% CI = -0.81), thus supporting the proposed indirect effect model.

Hypothesis #5: Investigating the relations between interactional synchrony, maternal reactions to children's negative emotions, and children's emotion regulation and social skills. The final hypotheses examined the links between interactional synchrony, maternal reactions to children's negative emotions, and both child outcome variables.

Hypothesis 5a: Investigating the mediating effect of maternal reactions to children's negative emotions on the link between interactional synchrony and children's emotion regulation and social skills. To further clarify the link between

interactional synchrony and child outcomes (i.e., emotion regulation and social skills), a mediation model was tested. It was hypothesized that maternal reactions to children's negative emotions would mediate the link between interactional synchrony in the mother-child relationship and children's emotion regulation and social skills. That is, the quality of the mother-child relationship (i.e., interactional synchrony) was believed to influence mothers' reactions to their children's negative emotions, which in turn would affect children's emotion regulation and social skills (see Figure 5).

Preacher and Hayes' procedure, as described in Hypothesis 4 analyses, was used to identify and test possible mediation models. Possible mediation models were identified by examining the correlation matrix in Table 5 to examine relations between variables of interest. First, relations between interactional synchrony and maternal reactions to children's negative emotions were examined (path a). The correlation matrix revealed significant links between interactional synchrony in the free play task and mothers' personal distress, punitive, and minimizing reactions. Significant links were also revealed between interactional synchrony in the structured block task and mothers' problem-focused and minimizing reactions. Second, significant relations between these same maternal reactions to children's negative emotions and children's emotion regulation and social skills were examined (path b). The correlation matrix revealed significant links between maternal distress reactions and children's emotion regulation skills, between maternal punishing reactions and children's emotion regulation skills, cooperation skills, and assertion skills, between maternal minimizing reactions and children's cooperation, assertion, self-control, responsibility, and total social skills, between maternal problem-focused reactions and children's self-control skills, and

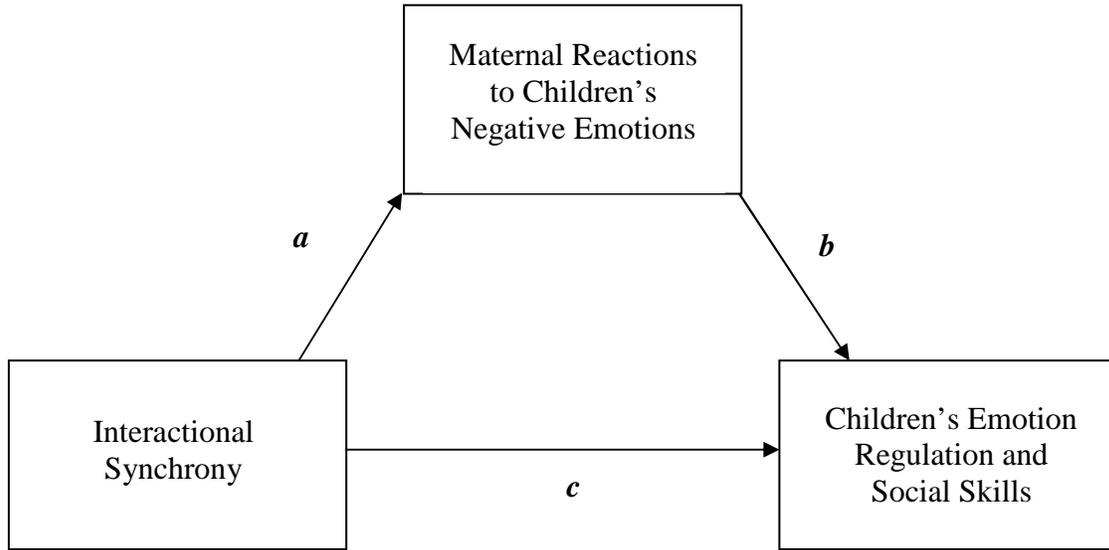


Figure 5. Hypothesized mediation model in which maternal reactions to children's negative emotions mediates the link between interactional synchrony and child outcome measures

between maternal minimizing reactions and children's cooperation, assertion, self-control, responsibility, and total social skills. At this stage, seven possible mediation models have been identified (see Figures 6a and 6b). For each of these seven models, bootstrapping macros were used to test each direct and indirect effect (path a, path b, path c, path c'), and to test the significance of the indirect effect (path a * path b) that was hypothesized.

The first model predicted that maternal personal distress reactions would mediate the link between interactional synchrony in the free play task and children's emotion regulation skills. Results revealed that interactional synchrony in the free play task significantly predicted maternal personal distress responses to children's negative emotions ($B = -0.37$, $SE = 0.12$, $t = -3.14$, $p < .00$), maternal personal distress reactions significantly predicted children's emotion regulation skills ($B = 1.88$, $SE = 0.58$, $t = 3.21$, $p < .00$), and the link between interactional synchrony in the free play task and children's emotion regulation skills was non-significant when maternal personal distress reactions were controlled for ($B = 0.43$, $SE = 0.76$, $t = 0.56$, $p = .57$). However, the link between maternal personal distress reactions and children's emotion regulation also was not significant ($B = -0.26$, $SE = 0.76$, $t = -0.35$, $p = .73$). This finding suggests that a mediational model is not supported, as there is no direct effect to be mediated; however, if the indirect effect (i.e., path a * path b) is significant, an indirect causation model is supported in which interactional synchrony in the free play task affects mothers' tendency to react to children's negative emotions with personal distress, which in turn affects children's emotion regulation skills. Tests of the strength of the indirect effect

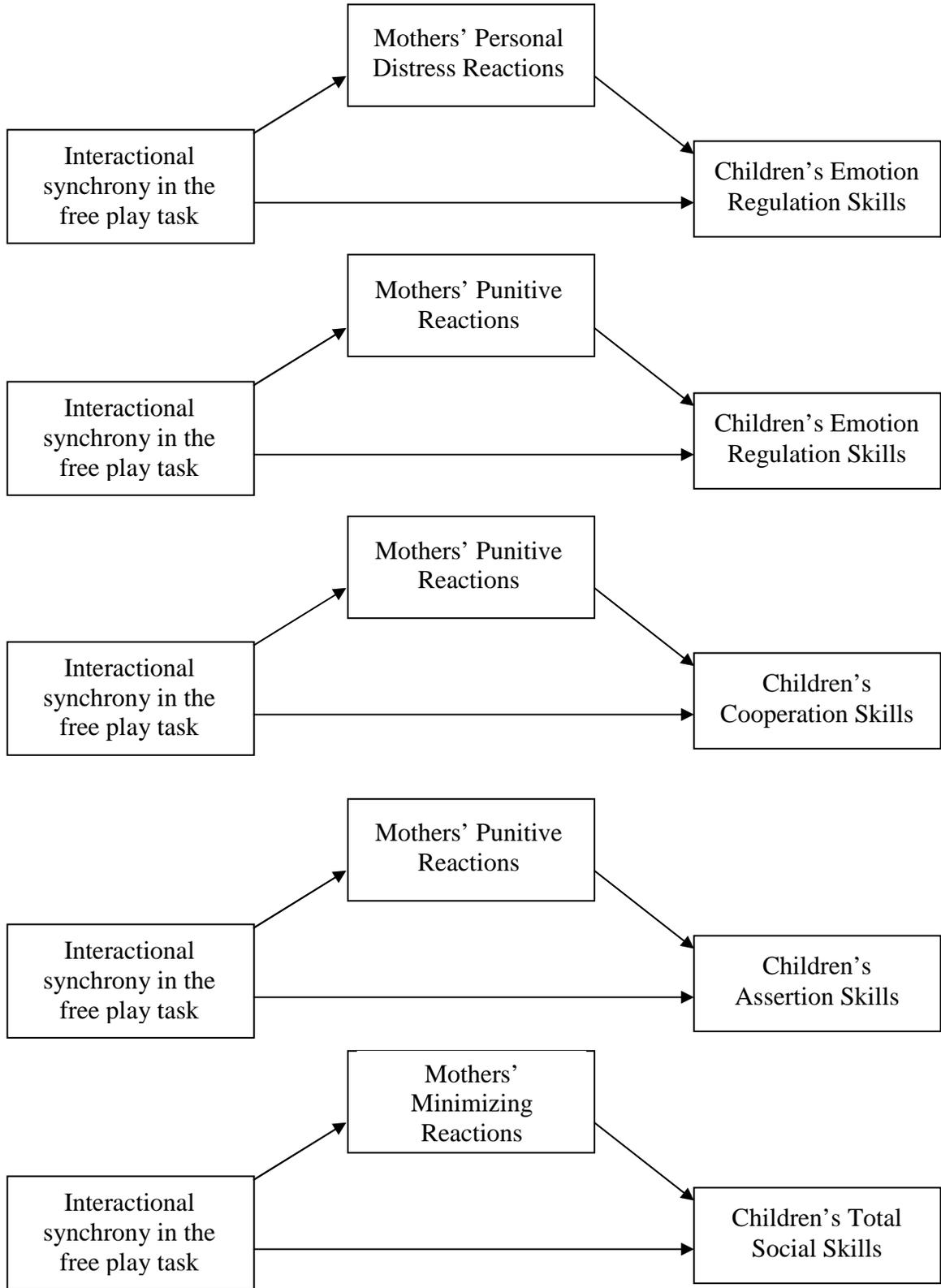


Figure 6a. Hypothesis 5a proposed mediation models for interactional synchrony during free play

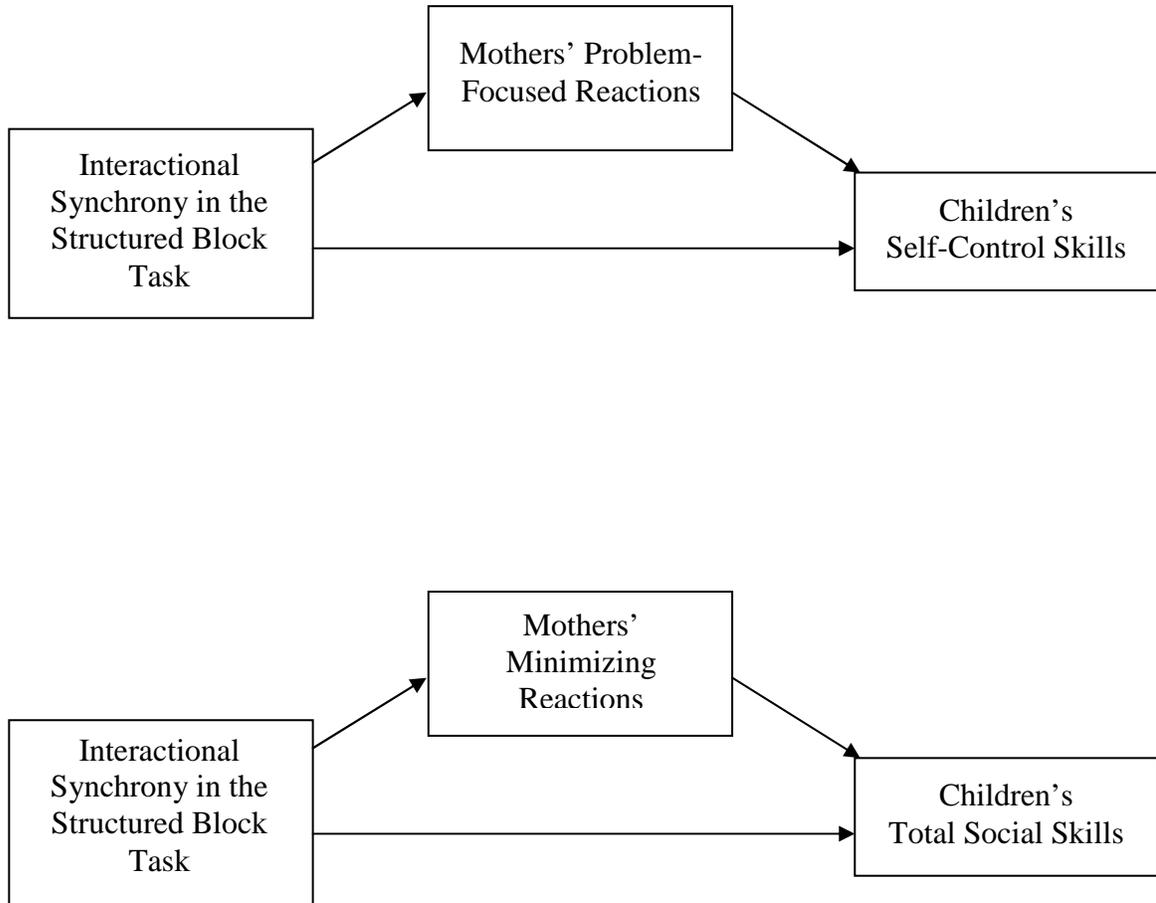


Figure 6b. Hypothesis 5a proposed mediation models for interactional synchrony during the structured block task

revealed that the effect was significant (Lower 95% CI = -1.48, Upper 95% CI = -0.13), thus supporting the proposed indirect effect model.

The second model predicted that maternal punitive reactions would mediate the link between interactional synchrony in the free play task and children's emotion regulation skills. This model was not supported. Results revealed that interactional synchrony in the free play task did not significantly predict maternal punitive responses to children's negative emotions ($B = -0.17$, $SE = 0.10$, $t = -1.67$, $p = .09$), maternal punitive reactions did not significantly predict children's emotion regulation skills ($B = 1.21$, $SE = 0.72$, $t = 1.68$, $p = .10$), and the indirect effect was not significant (Lower 95% CI = -0.65, Upper 95% CI = 0.08).

The third model predicted that maternal punitive reactions would mediate the link between interactional synchrony in the free play task and children's cooperation skills. This model was not supported. Results revealed that interactional synchrony in the free play task significantly predicted maternal punitive responses to children's negative emotions ($B = -0.20$, $SE = 0.10$, $t = -2.06$, $p = .04$), but maternal punitive reactions did not significantly predict children's cooperation skills ($B = 0.95$, $SE = 0.59$, $t = -1.63$, $p = .11$) and the indirect effect was not significant (Lower 95% CI = -0.07, Upper 95% CI = 0.60).

The fourth model predicted that maternal punitive reactions would mediate the link between interactional synchrony in the free play task and children's assertion skills. This model was not supported. Results revealed that interactional synchrony in the free play task significantly predicted maternal punitive responses to children's negative emotions ($B = -0.20$, $SE = 0.10$, $t = -2.06$, $p = .04$), but maternal punitive reactions did

not significantly predict children's assertion skills ($B = 0.49$, $SE = 0.52$, $t = -0.95$, $p = .34$) and the indirect effect was not significant (Lower 95% CI = -0.14, Upper 95% CI = 0.42).

The fifth model predicted that maternal minimizing reactions would mediate the link between interactional synchrony in the free play task and children's social skills. Given that maternal minimizing reactions were associated with all four types of social skills as well as the total social skills scale, and these five measures of social skills were found to be highly correlated (see Table 5), this model was tested using the total social skills scale to avoid heightened Type I error risk. Results revealed that interactional synchrony in the free play task significantly predicted maternal minimizing responses to children's negative emotions ($B = -0.40$, $SE = 0.15$, $t = -2.73$, $p = .01$), maternal minimizing reactions significantly predicted children's total social skills ($B = -6.73$, $SE = 1.85$, $t = -3.63$, $p < .00$), and the link between interactional synchrony in the free play task and children's total social skills was non-significant when maternal minimizing reactions were controlled for ($B = 0.84$, $SE = 2.96$, $t = 0.28$, $p = .78$). However, the link between interactional synchrony in the free play task and children's total social skills also was not significant ($B = 3.56$, $SE = 3.02$, $t = 1.18$, $p = .24$). This finding suggests that a mediational model is not supported, as there is no direct effect to be mediated; however, an indirect effect model in which interactional synchrony in the free play task affects mothers' tendency to use minimizing reactions to children's negative emotions, which in turn affects children's social skills can be tested. Tests of the strength of the indirect effect revealed that the effect was significant (Lower 95% CI = 0.59, Upper 95% CI = 5.36), thus supporting the proposed indirect effect model.

The sixth model predicted that maternal problem-focused reactions would mediate the link between interactional synchrony in the structured block task and children's self-control skills. This model was not supported. Results revealed that interactional synchrony in the structured block task significantly predicted maternal problem-focused responses to children's negative emotions ($B = -0.26$, $SE = 0.13$, $t = -1.98$, $p = .05$), but maternal problem-focused reactions did not significantly predict children's self-control skills ($B = 1.11$, $SE = 0.60$, $t = 1.84$, $p = .07$) and the indirect effect was not significant (Lower 95% CI = -0.81, Upper 95% CI = 0.07).

The final model predicted that maternal minimizing reactions would mediate the link between interactional synchrony in the structured block task and children's social skills. Similar to the fifth model, the total social skills scale was used instead of examining each social skills subtype separately to reduce the potential of Type I error. Results revealed that interactional synchrony in the structured block task significantly predicted maternal minimizing responses to children's negative emotions ($B = -0.52$, $SE = 0.20$, $t = -2.57$, $p = .01$), maternal minimizing reactions significantly predicted children's total social skills ($B = -7.31$, $SE = 1.80$, $t = -4.05$, $p < .00$), and the link between interactional synchrony in the structured block task and children's total social skills was non-significant when maternal minimizing reactions were controlled for ($B = 2.10$, $SE = 3.88$, $t = 0.54$, $p = .59$). However, the link between interactional synchrony in the structured block task and children's total social skills also was not significant ($B = 5.87$, $SE = 4.03$, $t = 1.46$, $p = .15$). This suggests that a mediational model is not supported, as there is no direct effect to be mediated; however, an indirect effect model in which interactional synchrony in the structured block task affects mothers' tendency to

use minimizing reactions to children's negative emotions, which in turn affects children's social skills can be tested. Tests of the strength of the indirect effect revealed that the effect was significant (Lower 95% CI = 0.80, Upper 95% CI = 7.69), thus supporting the proposed indirect effect model.

Hypothesis 5b: Investigating the moderating effect of interactional synchrony on the link between maternal reactions to children's negative emotions and children's emotions regulation and social skills. To further clarify the link between maternal reactions to children's negative emotions and child outcomes (i.e., emotion regulation and social skills), a moderation model was tested. It was hypothesized that the quality of the mother-child relationship, as measured by interactional synchrony, would moderate the link between maternal reactions to children's negative emotions and children's emotion regulation and social skills. A moderator is a variable that affects the direction or strength of a link between the independent and dependent variables (Baron & Kenny, 1986). Therefore, the current hypothesis suggests that the effect that mothers' reactions to children's negative emotions has on children's emotion regulation and social skills varies depending on the quality of the mother-child relationship (i.e., interactional synchrony). Specifically, it was expected that unsupportive maternal reactions to negative emotions would be more harmful for children's development of emotion regulation and social skills if the quality of the relationship was also poor (i.e., lower interactional synchrony levels), and that they would have less of a negative effect on child outcomes if the quality of the relationship was positive (i.e., higher interactional synchrony levels). Conversely, it was expected that supportive maternal reactions to children's negative emotions would have a stronger positive effect on children's

development of emotion regulation and social skills if the quality of the mother-child relationship was also positive, and that their positive effect would be weakened if the quality of the mother-child relationship was more negative.

To test moderation models, statistical analyses are used to measure the differential effect of the predictor variable on the outcome variable as a function of the moderator variable (Baron & Kenny, 1986). In hypotheses 1 and 2, the links between maternal reactions to children's negative emotions and children's emotion regulation and social skills were tested. It was found that mothers' distress reactions significantly predicted children's emotion regulation skills, mother's expressive encouragement reactions significantly predicted children's assertion and cooperation skills, and mothers' minimization reactions significantly predicted children's total social skills composite. Therefore, these links were re-examined to determine the effect of interactional synchrony as a moderating variable. Figure 7 shows a pictorial representation of the moderation models that were tested. Each model presented in Figure 7 was tested twice, once with interactional synchrony in the free play task as the moderator and once with interactional synchrony in the structured teaching task as the moderator.

The first model examined the link between maternal minimizing reactions and children's total social skills (composite including cooperation, assertion, responsibility, and self-control). Hierarchical regression analyses were used to examine the predictive power of the maternal minimizing reactions, interactional synchrony, and the interaction between minimizing reactions and interactional synchrony. Results revealed that the interaction term did not significantly predict children's social skills for either of the two synchrony tasks (see Table 15), which means that interactional synchrony in neither the

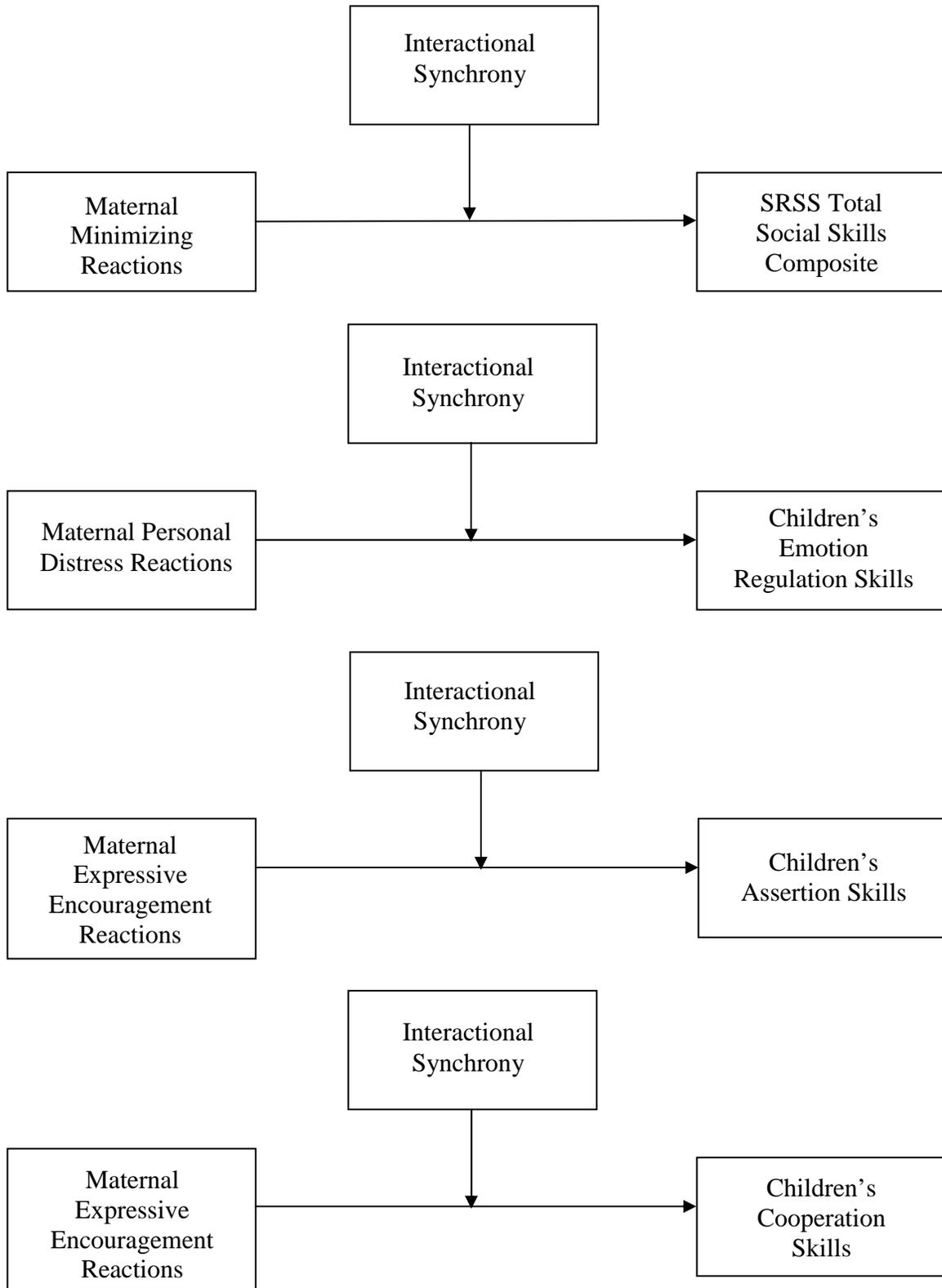


Figure 7. Moderation models tested in Hypothesis 5b

Table 15

Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Minimizing Reactions and SSRS Total Social Skills Composite

| | <i>B</i> | <i>SE B</i> | β | <i>p</i> |
|--|----------|-------------|---------|----------|
| IS in the Free Play Task Model | | | | |
| Minimizing Reactions | -6.73 | 1.86 | -0.34 | .000 |
| IS Free Play Task | 0.82 | 2.98 | 0.03 | .783 |
| Interaction Term | 0.18 | 3.30 | 0.01 | .956 |
| IS in the Structured Task Model | | | | |
| Minimizing Reactions | -7.51 | 1.82 | -0.38 | .000 |
| IS Structured Task | 2.42 | 3.90 | 0.06 | .537 |
| Interaction Term | -4.11 | 4.75 | -0.08 | .389 |

Note. All variables are centered for moderation test analyses; $R^2=.12$, adjusted $R^2 = .10$ for the IS Free Play model; $R^2=.16$, adjusted $R^2 = .13$ for the IS Structured Task model.

free play task nor the structured teaching task moderated the relation between maternal minimizing reactions and children's social skills.

The second model examined the link between maternal personal distress reactions and children's emotion regulation skills. Hierarchical regression analyses were used to examine the predictive power of the maternal personal distress reactions, interactional synchrony, and the interaction between personal distress reactions and interactional synchrony. Results revealed that the interaction term did not significantly predict children's emotion regulation skills for either of the two synchrony tasks (see Table 16), which means that interactional synchrony in neither the free play task nor the structured teaching task moderated the relation between maternal personal distress reactions and children's emotion regulation skills.

The third model examined the link between maternal expressive encouragement reactions and children's assertion skills. Hierarchical regression analyses were used to examine the predictive power of the maternal expressive encouragement reactions, interactional synchrony, and the interaction between expressive encouragement reactions and interactional synchrony. Results revealed that the interaction term did not significantly predict children's assertion skills for either of the two synchrony tasks (see Table 17), which means that interactional synchrony in neither the free play task nor the structured teaching task moderated the relation between maternal expressive encouragement reactions and children's assertion skills.

Finally, the fourth model examined the link between maternal expressive encouragement reactions and children's cooperation skills. Hierarchical regression analyses were used to examine the predictive power of the maternal expressive

Table 16

Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Personal Distress Reactions and Children's Emotion Regulation

| | <i>B</i> | <i>SE B</i> | β | <i>p</i> |
|--|----------|-------------|---------|----------|
| IS in the Free Play Task Model | | | | |
| Personal Distress Reactions | 2.03 | 0.59 | 0.33 | .001 |
| IS Free Play Task | 0.77 | 0.79 | 0.10 | .332 |
| Interaction Term | -1.70 | 1.07 | -0.15 | .116 |
| IS in the Structured Task Model | | | | |
| Personal Distress Reactions | 1.82 | 0.57 | 0.29 | .002 |
| IS Structured Task | 0.41 | 0.97 | 0.04 | .671 |
| Interaction Term | 0.70 | 1.58 | 0.04 | .657 |

Note. All variables are centered for moderation test analyses; $R^2=.11$, adjusted $R^2 = .08$ for the IS Free Play model; $R^2=.09$, adjusted $R^2 = .06$ for the IS Structured Task model.

Table 17

Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Mothers' Expressive Encouragement Reactions and Children's Assertion Skills

| | <i>B</i> | <i>SE B</i> | β | <i>p</i> |
|--|----------|-------------|---------|----------|
| IS in the Free Play Task Model | | | | |
| Expressive Encouragement | 0.72 | 0.28 | 0.24 | .011 |
| IS Free Play Task | 1.15 | 0.57 | 0.20 | .045 |
| Interaction Term | 0.43 | 0.78 | 0.05 | .584 |
| IS in the Structured Task Model | | | | |
| Expressive Encouragement | 0.86 | 0.28 | 0.28 | .002 |
| IS Structured Task | 1.84 | 0.71 | 0.23 | .011 |
| Interaction Term | -0.07 | 1.16 | -0.01 | .954 |

Note. All variables are centered for moderation test analyses; $R^2=.09$, adjusted $R^2 = .07$ for the IS Free Play model; $R^2=.12$, adjusted $R^2 = .10$ for the IS Structured Task model.

encouragement reactions, interactional synchrony, and the interaction between expressive encouragement reactions and interactional synchrony. Results revealed that the interaction term did not significantly predict children's cooperation skills for either of the two synchrony tasks (see Table 18), which means that interactional synchrony in neither the free play task nor the structured teaching task moderated the relation between maternal expressive encouragement reactions and children's cooperation skills. Therefore, Hypothesis 5b was not supported. The strength of the effect that mothers' reactions to children's negative emotions has on children's emotion regulation and social skills did not vary depending on the quality of the mother-child relationship (i.e., interactional synchrony).

Summary of Results

Results of the present study supported several of the hypotheses that were made. The first hypothesis was that mothers' reactions to children's negative emotions would predict children's emotion regulation skills. Results revealed that mothers who endorsed more personal distress in reaction to their children's negative emotions tended to have children who had more emotion regulation difficulties. The second hypothesis was that mothers' reactions to children's negative emotions would predict children's social skills. The results revealed that mothers who engaged in more minimizing reactions had children who exhibited fewer social skills overall, and mothers who engaged in more expressive encouragement reactions had children who exhibited more cooperation and assertion skills. The third hypothesis was that children's emotion regulation skills would predict children's social skills. Results supported this hypothesis. The fourth hypothesis was that the link between maternal reactions to children's negative emotions and

Table 18

Summary of the Hierarchical Regression Analysis for Testing Interactional Synchrony as a Moderator of the Link Between Mothers' Expressive Encouragement Reactions and Children's Cooperation Skills

| | <i>B</i> | <i>SE B</i> | β | <i>p</i> |
|--|----------|-------------|---------|----------|
| IS in the Free Play Task Model | | | | |
| Expressive Encouragement | 0.71 | 0.32 | 0.21 | .028 |
| IS Free Play Task | -0.12 | 0.65 | -0.02 | .860 |
| Interaction Term | -0.74 | 0.89 | -0.08 | .408 |
| IS in the Structured Task Model | | | | |
| Expressive Encouragement | 0.87 | 0.31 | 0.25 | .006 |
| IS Structured Task | 1.20 | 0.80 | 0.14 | .138 |
| Interaction Term | 0.48 | 1.32 | 0.03 | .719 |

Note. All variables are centered for moderation test analyses; $R^2=.06$, adjusted $R^2 = .03$ for the IS Free Play model; $R^2=.08$, adjusted $R^2 = .05$ for the IS Structured Task model.

children's social skills is mediated by children's emotion regulation skills. Results supported an indirect causation model in which mothers who responded to their children's negative emotions with personal distress were more likely to have children who had greater emotion regulation difficulties, and in turn these children exhibited fewer social skills. Hypothesis 5a suggested that the links between mother-child interactional synchrony and children's emotion regulation and social skills are mediated by maternal reactions to children's negative emotions. Results revealed three indirect causation models. Lower levels of interactional synchrony during the free play task were associated with mothers' tendency to react to their children's negative emotions with personal distress, and in turn, these children exhibited greater emotion regulation difficulties. In addition, lower levels of interactional synchrony during the free play and structured block tasks were both associated with mothers' tendency to use minimizing reactions to their children's negative emotions, and in turn, these children exhibited fewer social skills. Hypothesis 5b proposed that the links between maternal reactions to children's negative emotions and children's emotion regulation and social skills would be moderated by mother-child interactional synchrony; however, results did not support this hypothesis.

CHAPTER IV

Discussion

Emotion socialization is the process through which children develop emotion-related beliefs, values, and expressive behaviours through their interactions with others (Saarni, 1999). Several parental behaviours have been shown to affect children's emotion socialization, including the ways that parents react to their children's displays of negative emotions (Denham & Grout, 1993). Parental reactions to children's negative emotions have been shown to predict children's emotion regulation skills (Cole et al., 2009; Eisenberg et al., 1996; Lunkenheimer et al., 2007) and children's social skills (McDowell et al., 2002). Children's emotion regulation skills also have been shown to mediate the relation between parental reactions to children's negative emotions and children's social skills (Davidov & Grusec, 2006; Eisenberg et al., 1999; Gottman et al., 1996). It has been suggested that other aspects of the parent-child relationship (e.g., quality of the parent-child relationship) also should be examined to further clarify the relations between maternal emotion socialization behaviours and children emotion regulation and social skills (Cassidy, 1994; Thompson, 1994). The present study adds to the emotion socialization literature by examining whether maternal reactions to children's negative emotions predict children's emotional and social competence, and whether the quality of the mother-child relationship affects this pathway.

Maternal Reactions to Children's Negative Emotions and Children's Emotion Regulation Skills

The first objective of this study was to determine whether mothers' reactions to children's negative emotions would be predictive of children's ability to regulate their

own emotions, which is an important part of emotional competence. It was hypothesized that the three unsupportive maternal reactions (i.e., punishing, minimizing, and personal distress), would predict lower levels of emotion regulation. The present study found that mothers' reports of personal distress reactions were associated with mothers' reports of children's emotion regulation skills, such that mothers who endorse more personal distress reactions have children who are not as skilled at controlling their emotions, express more negative emotions, and shift from one emotional state to another very quickly. This finding is consistent with past research.

Eisenberg and Fabes (1994) found that maternal distress reactions were related to poor coping skills in children, including behavioural avoidance and low levels of venting when angry, in a sample of 79 mothers and their 4- to 6-year old children. Although these researchers did not directly assess children's emotion regulation skills, coping skills are believed to be one of the primary components of successful emotion regulation (Shipman et al., 2007). Perry and colleagues (2012) found that mothers' unsupportive reactions to children's negative emotions predicted children's emotion regulation skills. However, Perry and colleagues did not study each type of unsupportive reaction separately; they combined minimizing, punishing, and personal distress reactions into one composite variable. Taken together, findings from the present study, and from Eisenberg and Fabes' (1994) and Perry and colleagues' (2012) studies suggest that when mothers respond to their children's displays of negative emotions with their own overwhelming personal distress, their children tend to have underdeveloped emotion regulation skills.

The present study did not find significant associations between children's emotion regulation skills and mothers' reports of minimizing or punishing reactions. This stands

in contrast to past research. For instance, Spinrad and colleagues (2004) found that mothers who questioned their children's emotions when they were infants, which is a form of minimizing reaction, tended to have children who had poor emotion regulation skills when they were five years old. Similarly, Eisenberg et al. (1996) found that third and sixth grade children whose parents used minimizing reactions to children's negative emotions engaged in more avoidant coping techniques and fewer constructive coping techniques, which the authors suggested as indicating that these children had poor emotion regulation skills. Eisenberg and Fabes (1994) also found that 4- to 6-year-old children whose parents engaged in punishing or minimizing reactions had poor emotional coping skills; these children used fewer constructive coping and more avoidant coping during peer conflict situations, did not tend to vent their emotions, and usually tried to escape or seek revenge during anger-provoking situations with their peers. Berlin and Cassidy (2003) also reported that mothers who suppressed their preschool-aged children's negative emotions were more likely to have children who suppressed their anger and were less likely to express sadness and share their sadness with their mothers.

The discrepancies between these past studies and findings from this study may be due to differences in the constructs assessed and the methodological procedures used. Eisenberg et al. (1996) and Eisenberg and Fabes (1994) examined the relations between parental reactions to children's negative emotions and children's coping skills. Although coping skills are believed to be one of the primary components of successful emotion regulation (Shipman et al., 2007), they may not fully capture the construct of emotion regulation that the present study sought to examine. In the present study, children's emotion regulation skills were examined by measuring children's ability to control their

emotional reactions, including measures of their emotional negativity and their emotional lability. Whereas Eisenberg and colleagues' work revealed that children whose parents react to their negative emotions with punishing and minimizing behaviours may use more avoidant coping techniques, use fewer constructive coping techniques, not vent their emotions as much, and tend to try to seek revenge during anger-provoking situations with peers (Eisenberg and Fabes, 1994; Eisenberg et al., 1996), the present results suggest that these children do not exhibit greater emotional negativity or emotional lability.

Methodological differences may also explain inconsistencies between the present study findings and Spinrad and colleagues' (2004) and Berlin and Cassidy's (2003) work. Spinrad and colleagues used an observational method to assess mothers' reactions to children's negative emotions and they only examined mothers' tendency to question their children's emotions. The present study used parent-report measures of mothers' reactions to children's negative emotions and a broader construct of minimizing reactions was assessed. In addition, Spinrad and colleagues and Berlin and Cassidy measured children's emotion regulation skills by examining the children's ability to mask disappointment during a disappointment task. The present study used a broader measure of emotion regulation skills in that parent-report data were used to examine children's emotional negativity and emotional lability across a range of situations.

The discrepancy between the present results and Spinrad and colleagues' results may also provide evidence that a specific aspect of minimizing reactions has a unique negative effect on children's emotion regulation development, namely the direct questioning of children's emotions. The present study assessed minimizing behaviors that were characterized by maternal responses that tell the child they are over-reacting

(e.g., telling them not to make a big deal out of something, telling them they are overreacting, tell them to stop being a baby); these behaviors were not significantly related to children's emotion regulation skills. However, mothers' direct questioning of children's emotions was related to children's poor emotion regulation skills (Spinrad et al., 2004).

Overall, it appears that a wide range of methodologies have been used to explore the relation between unsupportive maternal reactions to children's negative emotions and children's emotion regulation skills. Given the mixed findings in the field, it seems appropriate for future research in this area to continue to explore this relation using measures that separately identify each type of unsupportive reaction rather than combining the reactions into an unsupportive composite. For example, Perry and colleagues (2012) combined minimizing, punishing, and personal distress reactions into one composite, and found that this composite predicted children's emotion regulation skills. However, the present study results suggest that maternal distress reactions predict children's emotion regulation skills, but maternal minimizing and punishing reactions do not.

It was also hypothesized that the three supportive maternal reactions would predict higher levels of children's emotion regulation skills. This hypothesis was unsupported. Significant relations were not found between mothers' reports of supportive reactions to children's negative emotions (i.e., emotion-focused, problem-focused, and expressive encouragement reactions) and children's emotion regulation skills. These results stand in contrast to work reported by Eisenberg and colleagues (1996) and Cole and colleagues (2009). Eisenberg and colleagues (1996) found that

children whose parents engage in emotion-focused reactions when they display negative emotions use more constructive coping techniques. They also found that children whose parents engage in problem-focused responses to negative emotions use more constructive coping skills. Cole and colleagues (2009) found that mothers' supportive reactions in response to 3- and 4-year-old children's distress was related to better strategy generation for coping with anger and sadness in these children. Although emotional coping skills are believed to be one of the primary components of successful emotion regulation (Shipman et al., 2007), they do not fully capture the construct of emotion regulation. The present study differs from Eisenberg and colleagues (1996) work and Cole and colleagues' (2009) work in that it examined children's emotion regulation skills more broadly, measuring children's ability to control their emotional reactions by examining their emotional negativity and their emotional lability.

Past research that has directly examined the associations between children's emotion regulation skills and parental reactions to children's negative emotions has produced mixed results. Spinrad and colleagues (2004) found mixed results for the long term effects of supportive maternal reactions to infants' distress and children's later emotion regulation strategies. They found inconsistent patterns for soothing, acceptance, and distraction responses to children's negative emotions. Mothers who soothed their infants or who accepted their infants' emotional expressions (i.e., emotion-focused and emotional encouragement responses) when their children were 15 months old tended to have children who were skilled at using distraction to regulate their emotions when they were 5 years old. In contrast, mothers' use of these two supportive strategies when the infants were 30 months old was related to lower rates of emotion regulation when the

children were 5 years old. The researchers suggest that these supportive reactions help teach children how to cope with emotion appropriately when they are young infants, but that by 30 months of age the infants have developed some regulation strategies and do not need to be directly comforted during challenging situations. Instead, these children may need more cognitively advanced input from their mothers during challenging situations, such as explaining the situation or the cause of the emotion to the child. Indeed, these researchers found that the use of explanation responses to 30-month-old infants' distress was linked to higher levels of emotion regulation skills in the 5-year-olds.

The results of the present study provide further support for Spinrad and colleagues' (2004) hypothesis that once children pass infancy, they may not need to be directly comforted during challenging situations; in the present study mothers' tendency to react to their preschool-aged children's negative emotions by encouraging them to express their feelings was not significantly related to children's emotion regulation skills. However, the current results do not provide support for Spinrad and colleagues' (2004) hypothesis that children who are past infancy need more cognitively advanced input from their mothers to develop emotion regulation skills; the present study did not find a significant association between mothers' emotion-focused or problem-focused responses and 3- to 6-year-olds' emotion regulation skills. The discrepancy between the present results and Spinrad's findings raises questions about the consistency of caregivers' reactions to their children's negative emotions as their children age. Spinrad and colleagues measured maternal responses to children's negative emotions when the children were 30 months old, which predicted the children's emotion regulation skills at 5

years of age. The present study did not find similar links when both factors were measured during the preschool years. Future research should use a longitudinal design to examine whether mothers of children with high levels of emotion regulation change their approach to children's negative emotions as their children age.

Maternal Reactions to Children's Negative Emotions and Children's Social Skills

The second objective of this study was to determine whether mothers' reactions to children's negative emotions would be predictive of children's social skills. It was hypothesized that unsupportive maternal reactions to children's negative emotions would predict lower levels of social skills in children. That is, children whose mothers engaged in punishing, minimizing, or personal distress reactions were expected to display fewer assertive, self-control, responsibility, and cooperation behaviours. This hypothesis was partially supported. The present study found that mothers who reacted to their children's negative emotions by minimizing their emotional experience tended to have children who exhibited fewer social skills, including cooperation, assertion, responsibility, and self-control skills. This finding is consistent with, and expands upon, past research.

Eisenberg and Fabes (1994) found that 4- to 6-year-old children whose mothers engaged in minimizing reactions usually tried to escape or seek revenge during anger-provoking situations with their peers. Although Eisenberg and Fabes did not directly measure cooperation, assertion, responsibility, or self-control skills, the escape and avoidance reactions that they observed suggested that these children lacked strong assertion skills. In addition, the revenge behaviours that they observed suggested that these children lacked appropriate self-control, cooperation, and responsibility skills, as these skills would inhibit a child's desire to seek revenge. Therefore, the present study's

findings support those of Eisenberg and Fabes (1994) and expand upon them by revealing a direct link between mothers' minimizing reactions and children's poor cooperation, assertion, responsibility, and self-control skills.

Mothers' punishing and personal distress reactions were not significantly correlated with children's social skills in the present study. Although there is limited past research on this topic, these results do stand in contrast to the work that has been done. For example, Eisenberg and Fabes (1994) found that 4- to 6-year-old children whose parents engaged in punishing reactions usually tried to escape or seek revenge during anger-provoking situations with their peers. They also found that parental distress reactions were linked to behavioural avoidance when children felt angry. These researchers focused on children's social reactions to anger-provoking situations, whereas the present study focused on children's global social skills in a variety of domains across multiple settings and time.

It was also hypothesized that supportive maternal reactions to children's negative emotions would predict higher levels of social skills. That is, children whose mothers engaged in emotion-focused, problem-focused, or expressive encouragement reactions were expected to display more assertion, self-control, responsibility, and cooperation behaviours. Results of the current study partially supported this hypothesis. The present study showed that mothers who reacted to their children's negative emotions by encouraging them to express their emotions in a healthy way tended to have children who exhibited more cooperation and assertion behaviours. To the author's knowledge, the present study was the first to directly explore the association between maternal expressive encouragement reactions and children's social skills.

Mothers' emotion-focused and problem-focused reactions were not significantly correlated with children's social skills. In contrast to the present findings, the limited past research that has been done revealed links between emotion-focused and problem-focused reactions and children's social skills. For example, Denham (1997) found that emotion-focused parental reactions were associated with higher rates of cooperative behaviours in 4- and 5-year-old children. Eisenberg and colleagues (1996) also found that children whose parents engaged in emotion-focused reactions when they displayed negative emotions tended to exhibit more cooperative behaviours. In addition, they found that children whose parents engaged in problem-focused responses to negative emotions had better developed social skills and were rated as being more friendly and cooperative. Several differences between these past studies and the present study could account for the discrepant findings.

Denham (1997) assessed parental reactions to negative emotions using a puppet task in which the puppet experiences several emotions and the children identify how the parent in the story would react. Cooperativeness was assessed by teachers using the Preschool Competence Questionnaire (Olson, 1984). Therefore, Denham's results suggest that children who perceive their parents' reactions to their negative emotions as emotion-focused tend to exhibit greater cooperative behaviours in the school setting. In contrast, the present study assessed mothers' reports of their typical reactions to their children's negative emotions and assessed children's cooperation behaviours across a variety of settings by using parent-report questionnaires. The discrepancy between the present results and Denham's results could suggest that children's perception of their

parents' reactions to their negative emotions is more predictive of children's cooperation behaviours than parents' perception of their reactions.

Eisenberg and colleagues (1996) measured children's social skills using a seven-item scale that assessed broad and general social skills, including whether the child acts appropriately, does what they are supposed to, or gets in arguments with other children. The present study assessed children's cooperation skills using a more specific and targeted measure that assessed a variety of cooperation skills. In addition, Eisenberg and colleagues' study was done with elementary-aged children, ranging from third to sixth grade. It is possible that the link between supportive parental reactions to children's negative emotions and children's social skill development gets stronger as children age. When the findings in this study are considered together with Eisenberg and colleagues' results, it appears that parents' emotion-focused reactions to children's negative emotions do not begin to predict children's cooperation behaviours until children are elementary school-aged.

Children's Emotion Regulation and Social Skills

Consistent with the study hypotheses, the present study found that children who had higher levels of emotion regulation difficulties exhibited fewer cooperation, assertion, responsibility, and self-control skills, and those with lower levels of emotion regulation difficulties exhibited more of these social skills. This finding is consistent with findings from past studies. For example, in past studies children's emotion regulation skills have been shown to predict their degree of social acceptance (Denham et al., 1990; Eisenberg et al., 1993), their ability to resolve conflict (Garner & Estep, 2001; Gottman et al., 1996), and their ability to find a mutually satisfactory play activity to

engage in with their peers, to compromise during play, and to empathize with a peer who is in distress (Gottman et al., 1996). Children's emotion regulation skills have also been shown to predict their friendliness (Baumrind, 1968; Denham & Burger, 1991; McDowell et al., 2000), cooperativeness (Baumrind, 1968), non-aggressive and non-oppositional behaviour (Baumrind, 1968; Denham et al., 2003), social competence (McDowell et al., 2000), prosocial behaviour (Denham & Burger, 1991; Garner & Estep, 2001; McDowell et al., 2002) and their willingness to initiate social interactions (Garner & Estep, 2001). These studies revealed links between children's emotion regulation and social skills in preschool and school-aged populations using a variety of methodologies, including teacher-report, parent-report, and observational techniques.

The results of the present study support the theory that emotion regulation skills are a necessary precursor to the development of social skills (e.g., Denham & Grout, 1993; Garner & Estep, 2001). Children who have strong emotion regulation skills are likely to be able to understand the causes of emotions, plan their behaviour effectively, engage in actions that are suited to their situations, and inhibit behaviours that are not socially appropriate in their current situation, each of which facilitates socially appropriate responses and behaviours (Eisenberg et al., 2007). In addition, children who can regulate their own emotions are more likely to be able to resolve conflict, find a mutually satisfactory play activity to engage in with their peers, compromise during play, and empathize with a peer who is in distress (Gottman, Katz, & Hooven, 1996).

Emotion Regulation as a Mediator of the Association between Maternal Reactions to Children's Emotions and Children's Social Skills

The fourth objective of this study was to determine whether the link between mothers' reactions to children's negative emotions and children's social skills was mediated by the children's emotion regulation skills. That is, it was expected that the mechanism through which parental reactions affect children's social skills would be the children's ability to regulate their emotions. This hypothesis was partially supported. An indirect effect model was identified in which maternal personal distress reactions affect children's emotion regulation skills, and in turn children's emotion regulation skills affect their social skills. That is, mothers who used more personal distress reactions to their children's negative emotions were more likely to have children who had poor emotion regulation skills, and in turn these children exhibited few cooperation, assertion, responsibility, and self-control skills. This indirect effects model is consistent with past research in this area. For example, using a sample of 6- to 12-year-old children and a longitudinal design, Eisenberg and colleagues (1999) found that children's emotion regulation skills partially mediated the link between mothers' personal distress reactions and children's disruptive behaviour with peers and adults. The present results expand upon Eisenberg and colleagues' (1999) work by supporting an indirect effect model for children's prosocial behaviors.

No mediation or indirect effect models for supportive maternal responses to children's negative emotions were revealed in the present study. However, using a sample of 4- to 5-year-old children, Gottman and colleagues (1996) found that children whose parents encouraged their negative emotional experiences and helped them

understand and manage their negative emotions could regulate their emotions more effectively. In addition, these children's emotion regulation skills further predicted their competent, nonaggressive behaviours with peers, showing a mediational effect of emotion regulation. These results suggest the theory that supportive reactions to children's negative emotions improve children's social skills by enhancing their readiness to learn about their own and others' thoughts, emotions, and behaviours in emotion-provoking situations, and by increasing their ability to cope with their own emotions in a way that allows them to maintain positive social interactions (Eisenberg et al., 1998a). However, results of the present study suggest that this mediation model may not be generalized to explain children's development of prosocial behaviours, specifically cooperation, responsibility, self-control, and assertion. It appears that supportive maternal reactions to children's negative emotions may help children develop the skills needed to refrain from aggressive behavior, but that these maternal reactions do not provide the necessary teaching and support that children need to practice prosocial behavior.

Quality of the Parent-Child Relationship, Maternal Emotion Socialization, and Children's Emotion Regulation and Social Skills

Interactional synchrony. Preliminary analyses revealed that interactional synchrony levels in the free play and structured block tasks were strongly correlated, and their associations with outcome and predictor variables were similar. The interactional synchrony scores attained by the present sample are similar to those found in other similar studies. For example, the sample of 35 mother-child dyads (45-76 months old) used in Lindsey and colleagues' (1997) study had interactional synchrony scores that

ranged from 1.40 to 4.47, with a sample mean of 2.88 and a standard deviation of 0.54. Similarly, Keown and Woodward's (2002) sample of 34 typically developing 47-62 month-old boys and their mothers had a mean interactional synchrony score of 3.44 and a standard deviation of 0.50. Overall, the synchrony scores in the present study appear consistent with what would be expected for the coding scheme that was used.

Results of the present study revealed links between interactional synchrony and maternal emotion socialization behaviours. Interactional synchrony levels in both the free play task and the structured block task were significantly negatively associated with mothers' minimizing reactions to children's negative emotions. That is, higher levels of interactional synchrony in the mother-child relationship were associated with less frequent minimizing reactions from mothers. High levels of interactional synchrony occur when mother-child dyads are highly in tune with each other, meaning they share similar emotions, they engage in reciprocal interactions with sharing and turn-taking, they make consistent eye contact, and they share responsibility for maintaining the interaction. Given the characteristics of those with high levels of interactional synchrony, it seems natural that these mothers would be less likely to minimize their children's emotions because they are more in tune with their children's emotions and experiences.

Interactional synchrony in the free play task was also significantly negatively associated with mothers' distress reactions to children's negative emotions, revealing that mothers who were more likely to react to their children's negative emotions with overwhelming personal distress were more likely to exhibit lower levels of synchrony with their children during unstructured free play interactions. However, this was not true for interactional synchrony in the structured block task. It is possible that the emotional

and behavioural dysregulation that makes mothers susceptible to reacting to children's negative emotions with personal distress also makes them susceptible to dysregulation during unstructured activities. These mothers' dysregulation may be more apparent during unstructured tasks (i.e., the free play task), resulting in increased difficulty maintaining synchronous interactions with their children, whereas their dysregulation may be less problematic during tasks that provide external structure and control (i.e., the structured block task).

Direct links between interactional synchrony levels and child outcome measures also were discovered. Specifically, interactional synchrony in the free play task and in the structured block task significantly correlated with children's assertiveness skills. Results of the present study suggest that children from mother-child dyads who exhibit higher levels of interactional synchrony tend to exhibit more assertion skills. This is consistent with past research on similar constructs. Past research has shown significant links between higher levels of parent-child interactional synchrony and children's peer acceptance (Lindsey et al., 1997; Mize & Pettit, 1997), teacher-rated social competence (Harrist et al., 1994; Lindsey et al., 1997; Mize & Pettit, 1997), and general social skills (Criss et al., 2003). In addition, multiple studies have shown links between lower levels of parent-child interactional synchrony and higher levels of externalizing behaviour (Deater-Deckard, Atzaba-Poria, & Pike, 2004) and aggression (Ambrose & Menna, 2013; Harrist et al., 1994; Mize & Pettit, 1997) in children. Taken together, past and present results reveal that children who have highly synchronous interactions with their parents tend to use assertion skills to express their needs and concerns in a socially appropriate way rather than resorting to aggression and externalizing behaviours.

Given this pattern, it was believed that children would also exhibit more emotion regulation skills than children who have lower levels of mother-child interactional synchrony, because the ability to regulate negative emotions would seem to be needed if a child is able to use assertion rather than aggression and externalizing behaviours to get their needs met. It also was expected that interactional synchrony levels in the free play and structured block tasks would also predict children's cooperation, responsibility, and self-control skills. Direct associations between interactional synchrony and children's emotion regulation, cooperation, responsibility, and self-control skills were not found. However, indirect effect models were revealed in which interactional synchrony levels were associated with maternal reactions to children's negative emotions, which were in turn associated with children's emotion regulation skills and social skills in all four areas tested. These models will now be discussed.

Models of interactional synchrony. The final objective of the present study was to examine the links between interactional synchrony, mothers' reactions to children's negative emotions, and both child outcome variables. Two models were tested to explain the relationship between these variables: a mediation model and a moderation model. The first model, which was a mediation model, predicted that mothers' reactions to children's negative emotions would mediate the link between interactional synchrony in the mother-child relationship and children's emotion regulation and social skills. That is, the quality of the mother-child relationship (i.e., interactional synchrony) was believed to influence mothers' reactions to their children's negative emotions, which in turn would affect children's emotion regulation and social skills.

Though the present results did not support the hypothesized mediation models, three indirect causation models were revealed. Lower levels of interactional synchrony during the free play task were associated with mothers' tendency to react to their children's negative emotions with personal distress, and in turn, these children exhibited greater emotion regulation difficulties. That is, mother-child interactional synchrony levels during free play tasks did not have a direct effect on children's emotion regulation skills, but they did have an indirect effect on emotion regulation skills through their association with maternal distress reactions to children's negative emotions. To the author's knowledge, the present study is the first to empirically test the link between interactional synchrony and children's emotion regulation skills.

Indirect causal models between interactional synchrony and children's social skills also were revealed. Lower levels of interactional synchrony both during the free play and the structured block tasks were associated with mothers' tendency to use minimizing reactions to their children's negative emotions, and in turn, these children exhibited fewer of all four social skills. That is, mother-child interactional synchrony levels did not have a direct effect on children's four areas of social skills, but the present study suggests that they did have an indirect effect on social skills through their association with mothers' minimizing reactions to children's negative emotions.

Results of the present study revealed several links between mother-child interactional synchrony in both free play and structured tasks and children's emotion regulation and social skills; however, the majority of these associations were indirect. Cassidy (1994) and Thompson (1994) were among the first to theorize that the link between children's social and emotional competence and the quality of the parent-child

relationship was indirect. They proposed a mediation model in which the quality of the mother-child relationship influences the types of reactions mothers have to their children's negative emotions, which in turn affects the children's development of social and emotional competence. The findings from this study do not lend direct support to a mediation model, but they do lend support to the theory that the quality of the mother-child relationship has an indirect effect on children's emotion regulation and social skills through its association with mothers' reactions to children's negative emotions.

Two past studies also have shown support for this mediation model. Berlin and Cassidy (2003) found that mothers of preschool-aged children who had a secure attachment were less likely to control their children's emotional expressions, and these children had more emotion regulation skills. In contrast, they found that mothers of children with an insecure-avoidant attachment were more controlling of their children's emotional expressions, and as a result these children were more likely to suppress their anger and displayed poor emotion regulation skills. Using a sample of toddlers and their mothers from low-income families, Brophy-Herb and colleagues (2010) found that the link between maternal emotion socialization behaviours (e.g., maternal emotional expressiveness and maternal emotion-coaching beliefs) and children's emotional and social competence was partially mediated by mothers' responsiveness. That is, maternal emotion socialization behaviours directly impacted children's emotional and social competence, but part of their effect also occurred through the impact of maternal responsiveness. Children's skills in four areas were used to measure their social and emotional competence: compliance, age-appropriate play, drive to master new skills, and empathy. Results from the present study provide additional support for indirect effects

models of the complex links between maternal emotion socialization behaviour, the quality of the mother-child relationship, and children's social and emotional competence.

The second model that was tested was a moderation model, predicting that the quality of the mother-child relationship would moderate the link between mothers' reactions to children's negative emotions and children's emotion regulation and social skills. This hypothesis suggested that the effect of mothers' reactions to children's negative emotions on children's emotion regulation and social skills would vary depending on the quality of the mother-child relationship (i.e., interactional synchrony). Specifically, it was expected that unsupportive maternal reactions to negative emotions would be more harmful for children's development of emotion regulation and social skills if the quality of the relationship was also poor (i.e., lower interactional synchrony levels), and that they would have less of a negative effect on child outcomes if the quality of the relationship was positive (i.e., higher interactional synchrony levels). In contrast, it was expected that supportive maternal reactions to children's negative emotions would have a stronger positive effect on children's development of emotion regulation and social skills if the quality of the mother-child relationship was also positive, and that their positive effect would be weakened if the quality of the mother-child relationship was more negative. The results of the present study did not support the hypothesized moderation model.

Eisenberg and colleagues (1998b) have suggested that the effectiveness of parental emotion socialization behaviours on children's development of emotional and social competence is moderated by several parenting dimensions, including the quality of the parent-child relationship. They theorized that the quality of children's relationships

with their parents may influence how these children respond to parents' emotion-related parenting practices, including parents' reactions to children's negative emotions (Eisenberg et al., 1998a). The findings from the present study do not support this theory, as none of the moderation models that were tested were significant.

Demographic Factors

Child age. Mothers of younger children reported using significantly more punitive reactions to their children's negative emotions than mothers of older children in this sample. However, follow-up analyses failed to find significant differences in mothers' punitive reactions to 3, 4, 5, and 6 year-olds' negative emotions. Past research revealed that mothers' use of punitive reactions followed a variable pattern as children aged; Eisenberg and colleagues (1999) found that mothers used more punitive reactions with 6- to 8-year-olds than with 4- to 6-year olds, they used less punitive reactions with 8- to 10-year-olds than they did with the 6- to 8-year olds, and they used more punitive reactions with 10- to 12-year olds than 8- to 10-year-olds.

Children's age also was significantly related to their social skills. Specifically, older children in this sample exhibited less cooperation and self-control skills than younger children. Given that it is unlikely that children lose cooperation and self-control skills as they age, this finding may indicate that mothers' expectations for children's cooperation and self-control skills increase at a rate that is disproportionate to children's actual development of these skills. That is, mothers of older children may have strongly heightened expectations of their children's cooperation and self-control skills, resulting in lower ratings of these children's skills.

Child gender. Mothers reported using significantly more expressive encouragement reactions to boys' negative emotions than girls', revealing that these mothers accepted and encouraged their sons' expressions of negative emotions more than their daughters'. This finding could be viewed as evidence against social constructionist views of masculinity that state that the emotion socialization of boys discourages and suppresses boys' sense of vulnerability, and thus their expression of emotion, whereas girls are generally encouraged to express a broad range of emotions (e.g., Froschl & Sprung, 2005). However, the present results could also be interpreted as evidence for constructionist views of masculinity; the present results suggest that boys were encouraged to express *negative* emotions, which is consistent with constructionist theories' suggestions that boys are encouraged to conform to traditional notions of masculinity, such as expressing anger (Feder, Levant, & Dean, 2010). Indeed, many gender-based emotion socialization theories suggest that young boys are encouraged to express certain emotions, such as anger, to a greater degree (e.g., Feder et al., 2010) whereas young girls are encouraged to be passive and empathetic with others' emotions, rather than focusing on their own emotions (e.g., Chaplin, Cole, & Zahn-Waxler, 2005; Conway, 2005). Future research should clarify this complex picture by determining whether mothers encourage a range of boys' negative emotions, or whether they primarily encourage anger, rather than fear, sadness, or embarrassment. Indeed, past research has found that parents use less expressive encouragement reactions to their school-age sons' sadness than they do to their daughters' sadness (Cassano, Perry-Parrish, & Zeman, 2007).

The present results could also be explained by bidirectional effects. That is, it is possible that mothers encouraged boys' negative emotions more than females' because they perceived boys as having a lack of emotion knowledge or emotional expression (Roger, Rinaldi, & Howe, 2012). For example, Roger and colleagues (2012) found that mothers and fathers talked about their own emotion states more with sons than daughters, and they hypothesized that the extra emotion coaching that sons received may have been an attempt to help scaffold and coach in a way that would increase boys' emotion knowledge.

Socio-economic status. Measures of socio-economic status (i.e., maternal education, family income, and family structure) were related to maternal reactions to children's negative emotions, mother-child interactional synchrony, and children's social skills. Mothers with higher levels of education tended to use more problem-focused reactions to children's negative emotions and fewer punitive and minimizing reactions. It is believed that lower levels of maternal education are associated with poorer parenting skills (Cole et al., 2007). It is possible that more educated mothers are more aware of the benefits of problem-focused reactions to children's negative emotions as they notice their children learning to use the problem-solving strategies that have been taught to relieve their negative emotion. In addition, more educated mothers may be more aware of the negative consequences of using punitive reactions to their children's negative emotions after they see that these reactions actually increase the child's negative arousal (Jones, Eisenberg, & Fabes, 2002).

Family socioeconomic status was also found to be related to mother-child interactional synchrony levels in the free play task. Mother-child dyads from families

with higher annual incomes displayed higher levels of interactional synchrony. This is consistent with past research; Lindsey and colleagues (1997) found that fathers who held lower status jobs were more directive in play with their children, making more suggestions and leading the interaction. That is, fathers with lower socioeconomic status engaged in interactions with their children that would be classified as having low interactional synchrony, due to their directive and leading behaviour. It is believed that lower socioeconomic status families experience more chronic stressors and negative life events that can adversely affect the parent-child relationship and parenting (e.g., Duncan, Brook-Gun, & Klebanov, 1994)

Finally, children from families of higher socioeconomic status exhibited more cooperation skills, more self-control skills, and a higher degree of general social skills than those in lower socioeconomic status families. Several factors could contribute to this link. For example, low socioeconomic status has been associated with poorer parent-child relationships (Fish, 2004), likely as a result of higher rates of chronic stressors and negative life events (Duncan, Brook-Gun, & Klebanov1994). It is possible that these strained parent-child relationships affect parents' ability to directly teach social skills, parents' ability to provide modelling of appropriate social skills that are meaningful to the child, and children's ability to attend to the social skills teaching that their parents do provide. In addition, children in families with lower socioeconomic status likely have less access to social environments that provide other opportunities to learn and practice social skills, such as sports teams, after-school group activities, and social outings with friends.

Study Limitations

The limitations of the present study primarily relate to the sample that was used. First, interactional synchrony was only assessed in mother-child dyads, and only mothers' reactions to children's negative emotions were examined. Although the recruitment methods did not specifically target mothers, it was mothers who initiated contact and followed through with participation in the study. As a result, the findings of the present study can only be generalized to mother-child interactions. The majority of the research that has been done on emotion socialization has been done with mothers (Kennedy Root & Denham, 2010). The research that has been done with fathers has shown that they have a distinct role in children's development of emotional competence (e.g., Eisenberg et al., 1996), but we are only just beginning to understand how fathers socialize emotions and how they impact children's development of emotional and social competence (Denham, Bassett, & Wyatt, 2010; Kennedy Root & Denham, 2010). Future studies should assess differences between interactional synchrony in mother-child and father-child dyads, as well as differences in the ways that mothers and fathers react to children's negative emotions, and how they affect children's development of social and emotional competence. Information about father-child synchrony and fathers' reactions to children's negative emotions could then be compared to information about mother-child synchrony and mothers' reactions to children's negative emotions with the same child. For example, Lindsey, Mize, and Pettit (1997) did not find any significant differences in synchrony levels between mother-child and father-child dyads, but did find that the amount of balance (a main component of interactional synchrony) that occurred during father-child interactions predicted children's social competence and peer

acceptance levels, but that the amount of balance during mother-child interactions did not predict the children's social competence levels.

Second, the study sample contained primarily Caucasian dyads. It would be ideal to have a more ethnically diverse sample so that the findings could be generalized to other ethnicities. To date, cultural differences in interactional synchrony and parental reactions to children's negative emotions have rarely been explored. One study that did explore differences in interactional synchrony between cultures compared Caucasian English families from England and Indian families who practiced the Hindu religion (Deater-Deckard et al., 2004). These researchers found that the Anglo Caucasian parent-child dyads displayed higher interactional synchrony levels than the Indian parent-child dyads. In addition, Lindsey and colleagues (2008) found that European American mother-child dyads exhibited higher levels of synchrony than African American mother-child dyads. However, in a sample of low-income families, Criss and colleagues (2003) found no differences between interactional synchrony levels exhibited by European Americans and ethnic minorities (i.e., primarily African Americans and a small sample of "other ethnic groups"). With respect to predictive ability, Lindsey and colleagues (2008) and Criss and colleagues (2003) each noted similar relations between interactional synchrony levels and their child outcome measures (i.e., adolescents' self-esteem and prosocial behavior, and children's antisocial behavior) across ethnic groups. Future studies should continue to examine interactional synchrony and parental reactions to children's negative emotions with parents and children from various ethnicities to determine how these factors differ between cultures and whether they relate to various child outcomes more or less in each culture.

Method variance issues were also a limitation of the present study. Mothers' reactions to children's negative emotions, children's emotion regulation skills, and children's social skills were all measured using mother-report questionnaires. Though attempts were made to recruit fathers to attain father-reported levels of children's emotion regulation and social skills, these attempts were unsuccessful. Multiple reports from a variety of sources and contexts (e.g., parent and teacher reports) regarding children's emotional and behavioural presentation would be ideal because reports may differ across environments and with alternate caregivers. In addition, the use of one measurement method (i.e., parent-report questionnaires) for more than one study variable increases risk of common method variance, which can artificially inflate correlations. However, results of the present study were generally consistent with others that have used varied methods to measure maternal emotion socialization and children's emotional and social competence (e.g., Denham & Grout, 1993; Eisenberg & Fabes, 1994; Fabes et al., 2001; Garner & Estep, 2001; Lukenheimer et al., 2007; McDowell et al., 2002; Perlman et al., 2008; Perry et al., 2012; Trentacosta & Fine, 2010). In addition, common method variance issues were reduced by using videotaped interactions to assess the quality of the parent-child interaction.

Another methodological limitation of the present study is that a cross-sectional design was used. The present study assumed that maternal emotion socialization behaviours precede children's emotional and social development based on past research that examined this developmental pathway (e.g., Brown & Dunn, 1996; Eisenberg et al., 1999; Spinrad et al., 2004). However, the present results cannot be used to draw causal

conclusions, and changes that occur in these developmental pathways as children age cannot be identified.

Directions for Future Research

The findings and limitations of the present study reveal several avenues for future research exploring the relation between parent-child relationships and children's emotional and social development. Although we now know that mothers' reactions to children's negative emotions and mother-child interactional synchrony are related to children's social and emotional competence, it would be helpful to know at what point in development these links become most salient so that early intervention and prevention programs can target families at the most advantageous time. It would also be beneficial to determine how the relations between emotion socialization, quality of the mother-child relationship, and children's social and emotional competence change as children age. For example, Spinrad and colleagues' (2004) findings suggested that different maternal reactions to children's negative emotions were predictive of children's emotion regulation skills at different stages of children's development. Future research on these relations should be conducted with a longitudinal design to better clarify these developmental pathways. Longitudinal research could also inform theory on the directional effect of some of these relations. For example, it would be beneficial to clarify the degree to which children's emotional and social competence impacts their interactional synchrony levels with their parents. By definition, interactional synchrony assesses the actions of both the parent and child as well as the fit between the two, suggesting that children's social and emotional competence would likely affect their ability to engage in a synchronous interaction. However, it is unknown to what degree

children's social and emotional competence and parent-child interactional synchrony levels affect each other in these bidirectional pathways.

Some of the findings from the present study are inconsistent with the hypotheses and with studies that examined similar constructs in the past. It is possible that the present null results are accurate representations, but it is also possible that the null results are due to the sample and methods that were used. Therefore, the links between maternal reactions to children's negative emotions, the quality of the mother-child relationship, and children's emotion regulation and social skills should be examined with diverse methodology and samples in future research to continue to clarify this complex field.

For example, future studies should be conducted with samples of ethnically diverse participants from a variety of socio-economic classes. The present study was conducted with a sample of primarily middle class, Caucasian, two parent, educated families. It is possible that stronger links between maternal emotion socialization behaviours, the quality of the parent-child relationship, and children's emotional and social competence would be discovered in higher risk samples (e.g., single parent homes, low socioeconomic status).

Future research in this area should also make special efforts to include fathers in the sample. In many studies that successfully recruited both mothers and fathers, paternal reactions to children's negative emotions were often linked to different child outcomes than maternal reactions to children's negative emotions (e.g., Eisenberg et al., 1996; see Denham et al., 2010 for a review). However, Denham and Kochanoff (2002) found few results when they examined paternal emotion socialization. Their results suggested that paternal emotion socialization had less predictive power than maternal emotion

socialization when predicting children's emotion knowledge. By including both mothers and fathers in this area of research, differences in parenting behaviours can be observed, and differences in mothers' and fathers' effects on children's developmental trajectory can be examined.

Future research in this area would also benefit from more diverse methodology. Currently, the most common methods in the field appear to be to use self-report questionnaires to assess parents' responses to children's negative emotions and parent or teacher-report questionnaires to assess children's emotion regulation and social skills. It would be helpful to use both questionnaire and observational data in a study to determine how families' ratings differ between the two methodologies and whether there are differences in the predictive power of questionnaire ratings and observational ratings. By comparing self-report and observational data, this type of research may provide information about the degree of insight parents have regarding their typical reactions to children's negative emotions. In addition, the discrepancy between the present results and Denham's (1997) results could suggest that children's perception of their parents' reactions to their negative emotions is more predictive of children's cooperation behaviours than parents' perceptions of their reactions. Future studies may benefit from examining both parents' and children's perceptions of parents' reactions to children's negative emotions to determine if meaningful discrepancies occur. It would be advantageous to determine how children's perceptions differ from their parents' perceptions, and if these perceptions differ, work can be done to determine how to help parents change their behaviour so that their children perceive them as helpful and effective in guiding them to calm their emotions. This information would be helpful

when designing intervention and prevention programs that aim to decrease parents' use of unsupportive reactions and increase their use of supportive reactions to children's negative emotions.

Future research in this area should also incorporate measures of children's temperament to better understand the unique role of the child in the emotion socialization process. The present study sought to advance the field by measuring the quality of the parent-child relationship by assessing the actions of the parent and the child, as well as the fit between the members of the dyad. However, most studies of parental emotion socialization, including the present study, do not assess children's temperament when examining the role of parental emotion socialization behaviors in children's development of emotional and social competence. Although it has been shown that children whose parents engage in maladaptive emotion socialization behaviors tend to exhibit poor emotional and social competence, it is also believed that more (Zahn-Waxler, 2010). Therefore, longitudinal studies that assess children's temperament as a unique contributing factor to the emotion socialization process are needed to gain insight into these complex interacting pathways.

Applied Implications

The findings from the present study suggest that mothers' personal distress and minimizing reactions to children's negative emotions, as well as lower levels of interactional synchrony in mother-child interactions, may be risk factors for problems with children's emotional and social development. Mothers' expressive encouragement reactions to children's negative emotions and higher levels of mother-child interactional synchrony may serve as protective factors for children's development of social skills. In

addition, interactional synchrony levels in mother-child interactions were shown to directly predict children's assertion skills, and to indirectly predict children's emotion regulation and total social skills. Taken together, these results reveal the importance of the mother-child relationship in children's healthy psychological development. These findings add to the emotion socialization literature by clarifying relations between mothers' reactions to children's negative emotions and children's emotion regulation and social skills, and by identifying the impact of the quality of the mother-child relationship on these relations. These findings may be used to inform intervention and prevention programs for children who exhibit poor emotion regulation or social skills, and for mothers who exhibit unsupportive reactions to their children's negative emotions. Ways in which the present results may be used to inform prevention and treatment programs will now be discussed.

It is known that children's behavioural and emotional development is heavily influenced by their parents, and that parenting practices can cause or exacerbate young children's problems (e.g., Eyeberg, 1998; Hembree-Kigin & McNeil, 1995). Eyeberg (1988) theorized that most of the behaviour problems that young children exhibit are established through their earliest interactions with their parents. She and others have claimed that even in the cases where the child's problem behaviours seem to originate from biological factors such as difficult temperament or neurological defects, the majority of the problem behaviours seem to be intensified by the patterns of interaction between the parent and the child.

Clinicians working with children who exhibit emotional or social competency issues need to be aware of maternal emotion socialization and interactional synchrony,

and in order to best serve the children they work with they will need to familiarize themselves with techniques aimed at improving the quality of the parent-child relationship and helping mothers learn how to respond to their children's negative emotions in a supportive manner. Parents can be educated by mental health professionals about the importance of supportive responding to children's negative emotions (e.g., Gottman et al., 1996). Additionally, family therapy can be used as a means for clinicians to help parents identify and understand their beliefs about negative emotions, challenge and adapt irrational or maladaptive beliefs, and use parent training to teach them to use supportive responses to their children's negative emotions (e.g., McDonough, 1995; 2004). Similarly, parents can be taught about interactional synchrony and its importance, then parent-child work can be used to increase dyads' responsiveness, balance, goal sharing, turn-taking, eye contact, physical closeness, affect sharing, and engagement during their interactions. However, it must be noted that these recommendations are based on findings from a study that used primarily Caucasian participants. Further research is needed to determine whether these therapeutic approaches would be appropriate for individuals from cultures with differing societal values and norms.

The present study revealed links between mothers' reactions to children's negative emotions, the quality of the mother-child relationship, and preschool-aged children's emotional and social competence. These results highlight the importance of early intervention. Children who had poorer quality relationships with their mothers or whose mothers tended to react to their negative emotions in an unsupportive manner had already started to show weaker emotional and social competence than those who did not experience these family dynamics when they were preschool-aged; therefore, the impact

of poor emotion socialization and poor parent-child relationships can be seen as early as three years of age.

Early interventions with these families will be crucial, as it is possible that children's social and emotional weaknesses could become more entrenched if they are exposed to these risk factors for longer periods of their lives. From a developmental psychopathology perspective (e.g., Cicchetti, 1990), when children begin down a pathway of poor emotion regulation and undeveloped social skills and do not receive appropriate early intervention, they may run the risk of integrating these weaknesses into their self-concept and being labelled by teachers and peers, thus creating more barriers to learning appropriate social and emotional competence skills. In contrast, those who receive early intervention and gain emotion regulation and social skills are likely to be exposed to even more opportunities to grow and develop, as they would be more accepted by their peers and important adults and would be more likely to choose equally skilled peers to spend time with.

Intervention during the preschool years would not only potentially interrupt maladaptive developmental pathways for children, but it is also believed to be the most effective time to provide intervention (e.g., Hembree-Kigin & McNeil, 1995; Landy & Menna, 2006; Webster-Stratton, & Taylor, 2001). There is no other time in childhood or adolescence that parents are in as strong of a position to influence their children's behaviour in such a dramatic and pervasive way as they are when the children are preschool-aged (Hembree-Kigin & McNeil, 1995). During these early years the parents are the center of their children's world because they provide sustenance, nurturance, safety, and learning opportunities (Hembree-Kigin & McNeil, 1995). In contrast, as the

children age they are increasingly influenced by their peers, teachers, romantic partners, and others (Hembree-Kigin & McNeil, 1995). Therefore, it is critical that intervention and prevention efforts are targeted toward young children and their parents, when they remain highly influenced by their parents and their behaviour patterns are malleable.

The results also revealed several demographic variables that were risk factors for unsupportive maternal reactions to children's negative emotions. Specifically, mothers with lower levels of education, who were single mothers, and who had lower annual family incomes tended to endorse fewer supportive reactions to children's negative emotions and endorsed more unsupportive reactions. In addition, mothers used more punitive reactions in response to younger children's negative emotions, and male children were encouraged to express their emotions more than female children. These findings reveal the importance of targeted prevention programs for at risk populations.

Results of the present study also revealed that poor emotion regulation skills were a risk factor for poor social skills in children, whereas stronger emotion regulation skills were linked to greater social skills. These results underscore the importance of intervention and prevention programs that target emotion regulation skill development in children. For example, children who exhibit poor social skills would likely benefit from emotion regulation coaching. In addition, prevention programs that emphasize emotion regulation skills could also be effective in preventing social skill deficits, as these skill sets are strongly linked. Again, prevention and early intervention programs during the preschool years should be emphasized as they are believed to be most effective (e.g., Goodwin, Pacey, & Grace, 2003; Hembree-Kigin & McNeil, 1995; Landy & Menna, 2006; Webster-Stratton, & Taylor, 2001).

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Appendix A. Demographics Questionnaire

Demographics Questionnaire

The Canadian Psychological Association recommends that researchers report the major demographic characteristics of research participants. To assist us in collecting this information, please complete this brief questionnaire (use the back if needed). All data are confidential and will not be used in any way that identifies you or your child. If you have any questions concerning any of the items, please do not hesitate to ask them.

Child's Name _____

Today's Date _____

Child's birth date (please include day, month, and year) _____

Child's current grade _____

Child's gender _____

Your relationship to child (e.g., mother, father) _____

Parents' Marital Status

- Married
- Divorced
- Separated
- Living together
- Remarried
- None of the above (Please Specify: _____)

Who does the child live with most of the time?

- Mother
- Father
- Step-father
- Step-mother
- Other (Please Specify: _____)
-

Father's education

- Less than 7 years
- Junior high school (Grade 9)
- Some high school (Grade 10 or 11)
- Graduated from high school or equivalent high school diploma
- Some college or university (at least one year)
- Graduated from college or university
- Graduate/professional school (e.g., Master's, Ph.D.)
- Other _____

Mother's education

- Less than 7 years
- Junior high school (Grade 9)
- Some high school (Grade 10 or 11)
- Graduated from high school or equivalent high school diploma
- Some college or university (at least one year)
- Graduated from college or university
- Graduate/professional school (e.g., Master's, Ph.D.)
- Other _____

Please describe stepparents' education if applicable:

Stepmother:

- Less than 7 years
- Junior high school (Grade 9)
- Some high school (Grade 10 or 11)
- Graduated from high school or equivalent high school diploma
- Some college or university (at least one year)
- Graduated from college or university
- Graduate/professional school (e.g., Master's, Ph.D.)
- Other _____

Stepfather:

- Less than 7 years
- Junior high school (Grade 9)
- Some high school (Grade 10 or 11)
- Graduated from high school or equivalent high school diploma
- Some college or university (at least one year)
- Graduated from college or university
- Graduate/professional school (e.g., Master's, Ph.D.)
- Other _____

Mother's occupation _____

Father's occupation _____

Please describe stepparents' occupations if applicable: _____

Mother's ethnicity: (please choose the one that fits best)

- South Asian
- East Asian
- Caucasian
- African Canadian
- Caribbean
- Hispanic
- Native Canadian
- Biracial - Please Specify _____
- Multi-racial - Please Specify _____
- Other – Please Specify _____

Father's ethnicity (please choose the one that fits best):

- South Asian
- East Asian
- Caucasian
- African Canadian
- Caribbean
- Hispanic
- Native Canadian
- Biracial - Please Specify _____
- Multi-racial - Please Specify _____
- Other – Please Specify _____

If applicable: Stepfather's ethnicity

- South Asian
- East Asian
- Caucasian
- African Canadian
- Caribbean
- Hispanic
- Native Canadian
- Biracial - Please Specify _____
- Multi-racial - Please Specify _____
- Other – Please Specify _____

If applicable: Stepmother's ethnicity

- South Asian
- East Asian
- Caucasian
- African Canadian
- Caribbean
- Hispanic
- Native Canadian
- Biracial - Please Specify _____
- Multi-racial - Please Specify _____
- Other – Please Specify _____

Has your child been diagnosed with a disability or a psychological disorder? _____

If so, please specify _____

Has your child been suspected of having a learning disorder?

If so, please specify _____

Do you think your child has a disorder of any kind? _____

If so, what do you think the child has? _____

Is your child receiving any psychological services? _____

If so, please describe: _____

Does your child have a serious illness? _____

If so, please specify _____

Is your child currently taking any medications? _____

If so, please specify _____

Approximate total annual income of parent(s) who live with the child

- Under \$30 000
- \$ 30 000 to \$60 000
- \$ 61 000 to \$100 000
- \$ 101 000 to \$150 000
- \$ 151 000 to \$250 000
- Over \$250 000

Does your child have any siblings? If so, please indicate gender and date of birth for each child.

How would you describe your child as an infant? (e.g., easy, difficult, slow-to-warm up)

Imagine that your child came to you and told you that another child hit your child while they were playing on the playground. What would you tell your child to do?

Imagine that your child came to you and told you that another child was telling other children not to be friends with your child. What would you tell your child to do?

Please tell us anything else that you think we should know:

Appendix B. Corresponding Items between the BRIEF and BRIEF-P

| <i>Item</i> | <i>BRIEF-P item number</i> | <i>BRIEF item number</i> |
|---|----------------------------|--------------------------|
| Overreacts to small problems | 1 | 1 |
| Has explosive, angry outbursts | 6 | 7 |
| Becomes upset too easily | 11 | 70 |
| Has outbursts for little reason | 16 | 25 |
| Mood changes frequently | 21 | 26 |
| Small events trigger big reactions | 26 | 64 |
| Angry or tearful outbursts are intense but end suddenly | 31 | 62 |
| Reacts more strongly to situations than other children | 36 | 45 |

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