A Longitudinal Examination of Children's Emotion Regulation Problems, Negative
Parenting Behaviors, and the Development of Internalizing Behavior Problems

by

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To my wonderful family for their unending love and support.

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ABSTRACT

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Internalizing problems in preschool have been found to predict later anxiety and

depressive disorders, and outcomes may vary according to children's gender. Preschool

children's transitions to school pose additional risks, as this developmental period is

associated with increased social and cognitive demands. Despite the significance of this

age group and the long-term implications associated with early internalizing symptoms,

most studies have focused on early behavior problems; relatively few have examined

early precursors of internalizing disorders. One potential risk factor, particularly during

the preschool-to-school age transition, is emotion dysregulation. Specifically, emotion

overregulation, or excessive control of emotions, is ill-defined in current literature but

may be associated with later internalizing outcomes. Therefore, in the present study,

operational definitions of emotion overregulation were examined and clarified.

Structural equation modeling analyses were also conducted to investigate both concurrent

and longitudinal relationships between overregulation, negative parenting, and

internalizing outcome variables. The potential roles of social context and gender in relationships with children's adjustment were also explored. Participants were 235 children (113 girls) at elevated risk for behavior problems. Children's emotion dysregulation was assessed using a multi-method approach: 1) laboratory-based behavioral task; 2) mothers' reports of children's emotion overregulation-related temperament; and 3) teachers' reports of children's emotion dysregulated behavior. Negative parenting behaviors were assessed via maternal parenting questionnaires. Mothers and teachers reported on child internalizing outcomes at ages 3, 6, and 10 years. Our analysis revealed several interesting pathways between predictor variables and internalizing outcomes. In particular, several emotion overregulation variables predicted internalizing behaviors concurrently and longitudinally, and negative parenting predicted internalizing behaviors across time. Shy temperament, negative parenting, and internalizing behaviors were also stable from preschool to kindergarten, and prediction models also suggested temporal stability of these variables from preschool to late school-age. As expected, some differences between mother- and teacher-reported outcomes were found, suggesting the importance of examining multiple contexts. Although gender was not a significant moderator in the proposed model relationships, unique gender-related findings were revealed. Results are discussed with respect to the value of multi-contextual, multi-level analyses of children's early emotion regulation abilities and parenting behaviors for prevention of internalizing behavior problems.

CHAPTER I

INTRODUCTION

Internalizing problems, which include primarily anxious and depressive
symptoms (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000; McConaughy, Stanger, &
Achenbach, 1992), affect at least 18% of children and adolescents (Costello & Angold,
1995). These rates are likely to be an underestimation of actual prevalence, given that
symptoms can be difficult to detect (Reynolds, 1990). In addition, given the range in
levels of symptomatology, traditional, discrete methods of diagnosis may exclude
subclinical cases of anxiety and depression in children (Zahn-Waxler, Klimes-Dougan, &
Slattery, 2000).

While many studies have examined early childhood precursors of behavioral
problems (e.g., Green, Gesten, Greenwald, & Salcedo, 2008; Odgers et al., 2007),
relatively few have investigated specific early precursors of internalizing problems.
Furthermore, clarifying the ages during which these predictors are especially significant
will be particularly useful for treatment and prevention efforts. In particular, children's
transitions to school are associated with increased social demands; their abilities to
successfully adapt in the new setting may be linked with later outcomes (Masten &
Coatsworth, 1995). The focus of this dissertation will be on early risk factors associated
with the development of internalizing problems in kindergarten and late school-age
children.

In this dissertation, I plan to examine four constructs – child emotion regulation, child internalizing, child gender, and parenting – and mechanisms underlying associations between them. I will also examine the stability of emotion regulation abilities and psychopathology within groups and individuals over time. In particular, I will examine the roles of child emotion dysregulation and harsh parenting behaviors as risk factors for internalizing problems in later childhood. In what follows, I will review background studies on each construct, identify gaps in the literature, and propose how they will be addressed in this dissertation.

Early internalizing behaviors as a risk factor

Recent studies suggest that internalizing problems in preschool can predict later anxiety and depression, further highlighting the need for early identification of those at risk for these disorders (e.g., De Bolle, De Clercq, Van Leeuwen, Decuyper, Rosseel, et al., 2009; Karevold, Roysamb, Ystrom, & Mathieson, 2009). In addition, internalizing problem behaviors in early childhood are moderately stable and associated with severe negative outcomes (e.g., Luby, Si, Belden, Tandon, & Spitznagel, 2009; Lavigne, Arend, Rosenbaum, Binns, et al., 1998). In a nine-year longitudinal study conducted in the Netherlands, internalizing symptoms in both boys and girls at ages 4 and 5 predicted internalizing symptoms at age 11 (Ashford, Smit, van Lier, Cuijpers, & Koot, 2008). Similarly, in a large population-based sample of 346 children, longitudinal pathways for internalizing problems were examined between preschool and adolescence (Mesman, Bongers, & Koot, 2001). Results showed homotypic continuity for internalizing problems over time, based on parent and teacher reports. A recent community-based study of 306 preschoolers also found homotypic continuity over a 2 year period, and

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found that depression in the preschool years was a significant predictor of later depression (Luby, Si, Belden, Tandon, & Spitznagel, 2009). Another recent longitudinal study of 2-year-old children found continuity in internalizing symptoms over a 5 year period (Bayer, Hastings, Sanson, Ukoumunne, and Rubin, 2010). Recent findings from the Pittsburgh Girls' Study (Keenan, Feng, Hipwell, & Klostermann, 2009) revealed stability in girls' internalizing symptoms from the early school-age period (ages 6-9) to early adolescence (ages 11-13). Those with stable or increasing internalizing symptoms over time are at even greater risk for later internalizing psychopathology. An eight-year longitudinal study by Feng, Shaw, and Silk (2008) which examined anxiety symptoms in boys, found that those who steadily increased in symptomatology over time were five times more likely for later anxiety symptoms.

Further, young children who are diagnosed with emotional disorders are at great risk for continuing to suffer from these problems over time, as well as for developing additional co-occurring disorders. In a sample of 500 preschool-aged boys and girls examined longitudinally, 57% of those children who were initially diagnosed with internalizing disorders at ages 2-3 showed stable diagnoses 1-3 years later; 43% showed stable diagnoses 1-2 years beyond the second measurement period (Lavigne, Arend, Rosenbaum, Binns, et al., 1998). In the same sample, those who were initially diagnosed at ages 4-5 showed even greater stability in diagnoses over time; 90% retained their diagnoses 1-3 years later and in 78%, 1-2 years beyond. In the same group of children diagnosed with internalizing disorders at ages 2-3, 28% developed a co-occurring externalizing disorder by the time of the 1-3 year follow-up period, suggesting that exhibiting early internalizing behaviors can put young children at risk for a variety of

negative outcomes (Lavigne et al., 1998). Feng, Shaw, and Silk's (2008) longitudinal study of boys with anxiety symptoms found that those who increased in symptomatology over time were 12 times more likely for later co-occurring internalizing disorders. Based on these findings, early symptoms of internalizing behaviors should be targeted to reduce the risk of the development of later internalizing and externalizing disorders.

<u>Construct of emotion regulation</u>

One such early symptom of internalizing problems may be related to emotional processes. Most DSM-IV Axis I disorders, particularly those classified within the internalizing group (i.e., mood and anxiety disorders), are linked with emotion-related difficulties (American Psychological Association, 2000). More specifically, the degree of congruence between internal affective states and the external expression of emotion is directly linked to one's ability to regulate experienced emotions. Internalizing problems can involve both extreme levels of experienced negative emotions, and maladaptive efforts to diminish or control these emotions (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000).

Emotion regulation is generally considered as one's pattern of organizing emotions in response to contextual demands (Cole, Michel, & Teti, 1994a). Due to its great complexity, however, researchers have had great difficulty achieving a single, common definition for the construct (Izard, 2010; Cole, Martin, & Dennis, 2004). Regardless of its specific definition, emotion regulation is considered a critical component of development, particularly because of its early role in developing socio-emotional skills and maintaining relationships. These skills are especially important for establishing positive peer (Denham, Blair, DeMulder, Levitas, Sawyer, Auerbach-Major

et al., 2003; Keenan, 2000; Hubbard & Coie, 1994) and adult (Graziano, Reavis, Keane, & Calkins, 2007) relations. Emotion regulation is also important in the development of cognitive abilities and has been positively associated with early academic success, even after accounting for IQ (Graziano et al., 2007; Trentacosta & Izard, 2007; Denham, 2006).

According to the functionalist perspective, emotions are defined as "bi-directional processes of establishing, maintaining, or disrupting significant relationships between the person and the internal or external environment, when such relations are significant to the individual" (Barrett & Campos, 1987, p. 558). That is, this approach emphasizes the importance of emotion regulation in the development of adaptive socioemotional functioning skills, as emotions have both *intra*personal and *inter*personal components. Processes of emotion regulation also are dynamic; for example, emotional experience and expression is modulated by social and situational factors (Campos, Mumme, Kermoian, & Campos, 1994; Campos et al., 1989). Emotion regulation helps to maintain socially appropriate emotions in individuals by allowing for flexibility in suppressing or permitting spontaneous reactions (Cole et al., 1994a). While most current researchers agree with the notion that effective emotion regulation is linked with adaptive social functioning, there is, however, still no true consensus on a common definition for the construct of emotion regulation (Blair, Denham, Kochanoff, & Whipple, 2004; Keenan, 2000).

Eisenberg and Fabes (1992) further emphasized the complex structure of emotion regulation by distinguishing between emotional regulation and emotion-related behavioral regulation. According to this model, emotion regulation involves the

"regulation of emotion-relevant internal states and processes", while emotion-related behavioral regulation involves "the communication of emotion and the inhibition or activation of behavior linked to emotion" (Eisenberg, Guthrie, Fabes, Shepard, Losoya, et al., 2000; p.1367). Therefore, Eisenberg and Fabes' model differentiates between the internal and overt behavioral components of emotion regulation. As an extension of the functionalist perspective, this model emphasizes the combined importance of the intra- and interpersonal aspects of socio-emotional development.

Precursors of both internal and overt emotion regulation skills are observed as early as infancy. In infants' first days of life, techniques such as head-turning and sucking are employed to cope with unpleasant states (Kopp, 1989). Between 3 and 8 months of age, infants increase their awareness of emotional arousal and begin to develop "elemental" emotion regulation abilities, with caregivers' social facilitation. A dramatic increase in regulatory skills is observed at the end of an infant's first year, as cognitive skills further develop. Another dramatic change in the quality and quantity of emotion regulation abilities occurs in the preschool- to school-age transition, approximately between the ages of 3 and 6 (Calkins & Marcovitch, 2010; Kopp, 1989). Emotion regulation rapidly becomes more complex during this time, as children increase their sense of self-awareness and agency (Kopps, 1989). In addition, as children mature, they encounter greater social demands (i.e., with peers, siblings, and parents), which necessitate more complex coping abilities (Losoya, Eisenberg, & Fabes, 1998); these demands continue to increase into adolescence and adulthood.

In conceptualizing children's emotion regulation, it also is important to account for the role of temperament. Temperament has been defined as "constitutionally based

individual differences" in how one responds in various domains, including attention, activity, and affect/emotion (Rothbart & Bates, 2006). Within the affect domain, emotionality refers to the ways in which positive and negative emotions are aroused in children. Individual differences in children's emotionality and arousal can affect the ways in which they regulate different emotions. For example, children who are higher in negative emotionality (i.e., experience more fear, anger, and sadness) may cope with their emotional responses in maladaptive ways, such as overly expressing or inhibiting emotions. While identifying temperamental characteristics is important in considering how children regulate emotions, developmental outcomes are influenced by multiple factors. That is, different pathways and outcomes commonly exist for children with similar temperaments (Kochanska, 1995).

Emotion dysregulation: under- and overregulation

Emotion regulation skills are critical to adaptive socioemotional functioning. Conversely, unhealthy patterns of emotion regulation "jeopardize or impair functioning, and such patterns may support or become symptoms of psychopathology" (Cole, Michel, & Teti, 1994a, p. 74; Barrett & Campos, 1987). Termed "emotion dysregulation", this *impaired* emotion pattern can disrupt emotion expression as well as attentional and social processes. Because depressive disorders are defined by excesses of negative affect and/or deficits of positive affect (Gross & Levenson, 1997), emotion dysregulation likely plays a particularly important role in the development of internalizing problems (Mennin, Heimberg, Turk, & Fresco, 2005). Shaw and colleagues (1997) found that even from infancy, problems with emotion regulation can predict preschool internalizing problems. In addition, because development of emotion regulation skills increase in complexity

throughout childhood and adolescence along with children's cognitive and socioemotional growth, examining the developmental patterns of these skills may better elucidate the factors relevant in these multifaceted relationships.

Developing appropriate skills for coping with negative emotions (e.g., sadness, anger), distress, and discomfort is particularly important as children transition into school, when social interactions and demands increase dramatically. In addition, as preschool-aged children begin to develop autonomy, their desires often conflict with constraints placed by caregivers; this commonly leads to increased negative, dysregulated emotions (Kopp, 1989). Managing negative emotions adaptively predicts children's later social success (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003). In a review by Losoya, Eisenberg, and Fabes (1998), several longitudinal studies examining typical emotion regulation development have found differences in strategy use in children between ages 4–6 to ages 6–8. For example, using avoidance as a strategy for coping with negative emotions increased linearly with age. With age, children also developed strategies that are more cognitively complex and inner-focused. Effective strategies for coping with negative emotions included positive cognitive restructuring and seeking out others for support, and these behaviors were related to positive social functioning (Losoya, Eisenberg, & Fabes, 1998). However, children who develop maladaptive strategies for regulating negative emotions and are unable to cope effectively may be at risk for problems with later psychosocial adjustment. Examples of such strategies include aggressive coping, venting, and in certain cases, avoidant coping (Losoya, Eisenberg, & Fabes, 1998).

Previous studies of maladaptive emotion regulation strategies have identified dysregulatory patterns that fall into two categories: overregulation and underregulation. These categories likely exist on opposite extremes of a continuum. This curvilinear pattern is similar to that of general findings regarding self-regulatory abilities; that is, both high and low ends of the self-regulatory abilities spectrum are maladaptive (see review by Gross, 1998). The vast majority of studies on emotion dysregulation have focused on the concept of underregulation, which typically is described as exhibiting high, intense levels of negative emotion and is more clearly associated with externalizing disorders (Mullin & Hinshaw, 2007). However, very little attention has been given to the overregulation and excessive control of emotions, which has been described as having a diminished or "blunted emotion expression or experience" (Cole, Michel, & Teti, 1994a; p. 80) and may be associated with internalizing disorders (Keenan & Hipwell, 2005). Overregulation can involve suppressing or masking emotions, through an absence of emotional display or substituting a more culturally-appropriate emotional display, respectively (Campos et al., 1994). In both situations, the actual experienced emotion is not expressed. One reason for the lack of research in this area may relate to the internal nature of the phenomenon and subsequent difficulty of measurement in young children, which differs greatly from the often overt nature of underregulated emotions.

In understanding emotion overregulation, the roles of specific temperament constructs should be explored. A temperament domain that has been related to overregulation is behavioral inhibition. It is considered an early temperamental system associated with child emotionality (Rothbart & Bates, 2006), and problems in the system have been linked to later behavioral problems (e.g., Eisenberg et al., 2004). Behavioral

inhibition describes young children's anxious and vigilant responses to stressful situations (Garcia-Coll, Kagan, & Reznick, 1984). For example, when exposed to strangers or unfamiliar objects, a behaviorally-inhibited toddler may withdraw and remain close to his or her mother for relatively long periods of time (Schwartz, Snidman, & Kagan, 1999). Behaviorally-inhibited children also experience greater levels of negative affect in response to stress, but they tend to attempt to decrease these emotions passively (Schwartz, Snidman, & Kagan, 1999). Therefore, because behavioral inhibition is related to minimizing negative affect, high levels of inhibition may be related to emotion overregulation. Children who are behaviorally inhibited have been shown to develop later internalizing problems such as depression and anxiety (Gest, 1997; Schwartz, Snidman, & Kagan, 1999; Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Hirshfeld-Becker, Biederman, Henin, Farone, Davis, et al., 2007; Feng et al., 2008).

Shyness, a temperament construct similar to behavioral inhibition, may be also related to emotion overregulation. While behavioral inhibition tends to be a more general temperament trait, shyness is more limited to feelings of discomfort and inhibition in *social* situations (Briggs & Smith, 1986). Shyness in early childhood has been associated with later internalizing problems in both school and home contexts (e.g., Sanson, Pedlow, Cann, Prior, & Oberklaid, 1996). A Norwegian longitudinal study found that shyness during the 18-month-old period significantly predicted internalizing problems at both 2.5 and 4.5 years (Mathieson, Sanson, Stoolmiller, & Karevold, 2009). In a study of 1-2 year olds conducted by Sanson and colleagues (1996), young toddlers rated by mothers as possessing a shy temperament exhibited significantly greater anxiety and fearfulness at

school and home, four years later. In addition, shyness was found to be moderately stable from ages 1 to 6. Further exploration of the relationships between temperamental, behavioral, and emotional components of overregulation may help in building a more complete conceptualization of the under-examined construct.

Emotion overregulation and the development of internalizing disorders

As described above, while there exists a great amount of research on emotion underregulation precursors of childhood behavior problems (e.g., Cole, Hall, & Radzioch, 2009), relatively little is known about emotion overregulation as a precursor of internalizing disorders. Although emotion overregulation may be associated with disorders such as depression and anxiety, findings are still sparse and unclear. For example, some studies have linked overregulation in early childhood with later internalizing psychopathology, whereas others have suggested future externalizing psychopathology (e.g., Keenan & Hipwell, 2005; Eisenberg et al., 2000; Cole et al., 1994b). In a recent study of school-age girls by Keenan, Hipwell, Hinze, and Babinski (2009), depressive symptoms were associated with those who overregulated their negative emotions. Overregulation was defined as suppressing negative emotions based on child self-report and observational data from a dyadic problem-solving task. On the other hand, Cole, Zahn-Waxler, and Smith (1994b) found that girls who overregulated their anger and sadness were more likely to experience later attention deficit and conduct disorder symptoms. In this study, overregulation was defined as exhibiting low levels of negative emotions after disappointment. A study by Cole, Zahn-Waxler, Fox, Usher, and Welsh (1996) found mixed results based on age, with overregulated children (i.e., those who suppressed their negative affective expressions during mood induction) having more

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externalizing symptoms in both preschool and first grade, as well as more internalizing symptoms in first grade.

<u>Gender and internalizing</u>

Children's gender may be critical in understanding these mixed outcomes in research on overregulation, and also may be a predictor in the development of later internalizing behaviors. Existing research have established that gender differences in prevalence of depressive symptoms emerge by early adolescence and increase rapidly with age (Essau, Lewinsohn, Seeley, & Sasagawa, 2010; Cole et al., 2002; Hankin et al., 1998; Keenan & Hipwell, 2005). From adolescence to adulthood, being female is "the strongest risk factor for internalizing problems", with females at least twice as likely as males to develop depression and anxiety (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000, p. 457). On the other hand, literature on early gender differences in the prevalence of internalizing behaviors is less well-established. However, it is likely that there exist early precursors predicting later gender-differentiated patterns of risk. Therefore, it is important to examine theses possible gender-specific early risk factors that may help explain the rise in depressive symptoms among adolescent females.

Gender may also play a role in the *continuity* of internalizing behaviors over time, as girls have been shown to manifest higher risk for depression and anxiety than boys (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). A longitudinal study of girls conducted by Keenan and colleagues (2009) found homotypic continuity of depressive and anxiety symptoms from early childhood to early adolescence. In another study using the same sample from the Pittsburgh Girls Study, subclinical depressive symptoms were found to be stable from ages 9 to 11 and were also predictive of later clinical depression

(Keenan, Hipwell, Feng, Babinski, et al., 2008). Continuity also seems to exist across different types of internalizing disorders, and gender may play a role in differential vulnerabilities to risk. For example, Chaplin, Gillham, and Seligman (2009) found that anxious symptoms predicted depressive symptoms one year later, and that results were stronger for early-adolescent girls than for boys. A study by Essau and colleagues (2010) revealed similar findings: early internalizing symptoms in girls led to a more chronic course of depression, as compared with boys.

Emotion dysregulation and social context

Another predictor of long-term outcomes may also relate to the social appropriateness of emotion regulatory strategies used by children. Situational flexibility in managing and expressing emotions is an important component of healthy emotional functioning (Saarni, 1999). Individuals display different regulatory styles depending on the familiarity of various social groups, including peers, parents, teachers, siblings (Zeman & Garber, 1996; Zeman et al., 1997), and environmental contexts (Cole et al., 1994a). Specifically, when in the presence of others, young children often show "spontaneous expressive control" by minimizing their emotional displays (Cole, Martin, & Dennis, 2004).

Theoretical work has clearly indicated the importance of flexible responding that is adaptive to social situations. In particular, research with adults has provided a framework for understanding the social components of emotion dysregulation. Butler and Gross (2004) discussed negative social and health consequences of suppressing the expression of emotions, including preventing interpersonal connections and increasing blood pressure and risk for mood and anxiety disorders. Ironically, suppression can even

increase negative emotion experiences while decreasing positive experiences (Ehring, Tuschen-Caffier, Schnulle, Fischer, & Gross, 2010; Butler & Gross, 2004; Gross & Levenson, 1997). Campbell-Sills, Barlow, Brown, and Hoffman (2006) found that suppression is particularly maladaptive for adults who have existing mood and anxiety disorders; suppressing negative emotions did not decrease the emotional experience, and was even associated with slower mood recovery. Holodynski and Friedlmeier (2006) describe this technique as "internalization" of emotion, during which the expression of the negative emotion is minimized, but negative feelings persist. Adult research examining the effects of emotional masking is much more limited, although it is likely that results are similar to suppression.

In children, emotion suppression may be an early pathway to internalizing disorders (e.g., Keenan & Hipwell, 2005). Developmentally, emotional experience also has been closely linked with social understanding (Saarni, 1999). For example, a child learns to socially mask an inappropriate emotion with another more appropriate emotional display (Campos et al., 1994; Cole, Michel, & Teti, 1994a). A study of 51 preschoolers' emotional displays during aggressive peer interactions found that those who showed joy in response to angry interactions (i.e., masking) were more likely to have poorer social adjustment and were less accepted by peers (Arsenio, Cooperman, & Lover, 2000). Emotion overregulation, which can be conceptualized as constricted responding that is inappropriate to context, is therefore socially-linked and a potential risk factor for negative long-term outcomes. Negative outcomes from the adult literature (e.g., Gross & Levenson, 1997) further support emotion overregulation as an early indicator of later psychological and physical maladjustment.

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The role of social context may be particularly important when examining the links between gender, emotion dysregulation, and psychopathology. According to Cole et al.'s (1994b) study, when in the presence of an experimenter, boys at risk for behavior problems showed more negative emotion and for longer durations than low-risk boys. When alone, however, low-risk boys expressed the same higher level of negative emotion as the at-risk group, suggesting that high-risk boys underregulated negative emotions in a social context. Girls displayed a different pattern and more positive emotion overall. In the social situation, high-risk girls displayed fewer positive emotions in response to disappointment than low-risk girls, although all girls showed more positive emotions than boys. Typically, this pattern of behavior suggests a socially adaptive awareness of others' feelings (Garner & Power, 1996). However, the study revealed surprising context-linked differences; when in the non-social alone condition, low-risk girls showed a threefold increase in their display of negative emotion. In contrast, girls at high risk for behavior problems continued to suppress their emotions, even when alone, suggesting an overregulation of negative emotions. Cole et al. (1994b) found that this cross-contextual overregulation of negative emotions predicted attention deficit and conduct disorder symptoms in the high-risk group. Thus, the type of social context in which emotion dysregulation behaviors occur, in combination with gender differences, may be important in distinguishing between related adaptive and maladaptive outcomes.

Measurement of emotion regulation

Contextual and gender-related differences are also important variables to consider when measuring emotion regulation in children. However, there is a general lack of consensus among researchers regarding measurement methodologies, which may be

related to differing working definitions of emotion regulation (Cole, Martin, & Dennis, 2004). These differences between studies in methods of measuring emotion overregulation are also a likely contributor to mixed results in the literature. Another challenge of examining emotion overregulation as a predictor of risk relates to the need for attending to developmental issues in measurement techniques.

In order to assess the construct of emotion dysregulation in young children, methods of accurately measuring internal states first must be implemented. Older children and adolescents are often given self-report questionnaires or are asked to describe their expected emotional reactions to a series of hypothetical provocative situations (e.g., Butler, Lee, & Gross, 2007, Zeman & Garber, 1996). However, most young children are not capable of accurately assessing, monitoring, and reporting their own emotions (Zeman, Klimes-Dougan, Cassano, & Adrian, 2007). In particular, studies have suggested that children below the age of six are not yet cognitively self-aware (e.g., Reynolds, 1990). Therefore, in children with less developed cognitive abilities, emotion dysregulation is often operationalized by measuring patterns of emotional *expression*.

One method for measuring children's emotional expression is using parent and teacher reports of child emotional behavior. Given young children's difficulty in accurately reporting their own emotion regulation techniques, observation by adults who interact with them regularly is a common alternative. Parent questionnaires measuring child temperament are also important in assessing qualities related to emotion regulation abilities, such as behavioral inhibition. However, overregulated affective expressions may be underreported by adults, due to their more covert nature (Cole, Michel, & Teti, 1994). In addition, secondary-report rating systems such as parent and teacher questionnaires

have been over-represented in studies of emotional expression and can provide a one-sided view of children's behaviors (Zeman, Klimes-Dougan, Cassano, & Adrian, 2007). Still, observations from parents and teachers are often valuable sources of children's daily behavior (Larsen & Prizmic-Larsen, 2006).

Measuring emotion regulation abilities *directly* in young children, through observational means, would reduce reporting biases and thus improve the likelihood for an accurate assessment. Laboratory-based observations of behavior have been used to measure regulation, such as clean-up tasks (e.g., Lehman, Steier, Guidash, & Wanna, 2002) but they tend to be relatively unstructured. More structured tasks, such as laboratory tasks measuring temperament (e.g., Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996), tend to capture temperament characteristics that are indirect measures of children's emotion regulation abilities. Saarni's (1984) Disappointment Task, which examines children's responses to disappointment, is one of the few structured, observational tasks for directly measuring negative emotion in young children so that individual differences in emotion regulation can be observed.

Another measurement issue relates to the limited distinctions made between types of emotion regulation abilities. While some structured emotion regulation measures exist, there is a lack of agreement on operational definitions and a paucity of research examining the specific construct of emotion overregulation. Instead, the few existing studies often focus on related constructs, such as emotion inhibition and suppression. For example, a recent study by Keenan, Hipwell, Hinze, and Babinski (2009) examined children's self-report ratings of emotional expressiveness, as well as coded emotional expressions during a dyadic problem-solving task. Data from these tasks were used to

calculate the level of inhibition of negative emotions. Inhibition was defined as "disengagement/distancing" and "expressive reluctance", such as attempting not to show sadness and distress despite feelings negative emotions. Similarly, Cole, Zahn-Waxler, Fox, Usher, and Welsh (1996) coded children's facial expressions in response to a negative mood induction video task, and grouped children into "inexpressive", "modulated expressive", and "highly expressive" categories. Establishing more specific operational definitions of overregulation, and including important moderating variables such as social context, may better capture the complexity of the construct.

Social context, an important variable to consider when assessing emotion regulation (Saarni, 1999; Cole, Martin, & Dennis, 2004), is accounted for in the laboratory-based Disappointment Task (Saarni, 1984). Still, research groups have differed in how they define overregulation-type behaviors in response to disappointment. For example, Cole and colleagues (1994b) and Kieras, Tobin, Graziano, and Rothbart (2005) examined whether levels of positive and negative expressions of affect changed with social contexts (i.e., social versus alone); Feng and colleagues (2008) examined levels of joy and sadness during the task, but without taking into account social context. On the other hand, Davis and colleagues (1995) compared whether frequencies of positive and negative emotional expressions differed when a child received a good, versus a bad, toy.

In addition, the most recent studies that utilize the Disappointment Task vary greatly in their use of the measure. For example, a recent study by Warren and Stifter (2008) examined preschool children's emotion-related discussions with their mothers *after* the Disappointment Task. They found that greater maternal emotion talk was

associated with children's adaptive emotion regulation abilities. Another recent study (Simonds, Kieras, Rueda, & Rothbart, 2007) examined school-aged children's use of cultural display rules during the Disappointment Task and found that this increased with age. Bohnert, Crnic, & Lim (2003) measured the level of angry responses exhibited by school-aged children during the Disappointment Task; more aggressive children showed greater levels of anger in response to disappointment. Recently, both Kieras and colleagues (2005) and Liebermann, Giesbrecht, and Müller (2007) compared children's behaviors on the Disappointment Task with temperament constructs. In addition, Feng and colleagues (2008) examined Disappointment Task performance of children with depressed mothers, while Carlson and Wang's (2007) study of preschoolers examined relationships between attentional and emotional abilities.

The great range in studies' use of the Disappointment Task likely reflects the current lack of agreement in how emotion regulation should be defined and measured (e.g., Izard, 2010; Cole, Martin, & Dennis, 2004). In addition, a major limitation of existing studies relates to their research design: each of the above studies utilizing the Disappointment Task was cross-sectional. It is likely that examining behavioral emotion regulation abilities over time would help to clarify issues related to defining the construct. For example, questions regarding the operationalization of emotion overregulation across development may be addressed. Therefore, given the limitations of existing studies using the Disappointment Task, exploration of longitudinal links between children's overregulation behaviors and long term outcomes are needed.

While directly observing emotion regulation skills is valuable in examining longitudinal relationships, the most comprehensive measures of risk are also multi-

contextual and multi-level (Cole & Deater-Deckard, 2009; Larsen & Prizmic-Larsen, 2006; Morris, Robinson, & Eisenberg, 2006). That is, relying solely on behavioral methods of assessing emotion regulation in the laboratory ignores children's emotion regulation abilities in other contexts. On the other hand, measuring only language-related indicators of emotion via self or secondary report disregards behavioral and psychophysiological indicators of regulation (Larsen & Prizmic-Larsen, 2006). Therefore, in the current study, assessment of emotion regulation will include both direct behavioral measurements and parent and teacher reports of children's emotion regulation and temperament. This multi-method approach will allow for examination of potential contributions of home, school, and unfamiliar contexts, as well as intra- and inter-individual factors, and has been shown to be valuable in longitudinal assessments of problem behaviors (Kerr, Lunkenheimer, & Olson, 2007).

Parenting and development of emotion understanding and regulation

Parenting behavior is one such contextual factor to consider when examining socio-environmental influences on the development of emotion regulation skills. Early in childhood, parents "coach" their children by defining and labeling emotions and guiding them to respond to emotions in particular ways (Gottman, Katz, & Hooven, 1996). Emotional awareness and identification of own and others' emotions are skills that indicate children's understanding of emotions (Saarni, 1990). Emotion understanding in preschool-aged children is positively linked with early academic success, as well as healthy socioemotional functioning (Leerkes, Paradis, O'Brien, Calkins, & Lange, 2008).

Parenting behaviors have been shown to make important contributions to the development of children's emotion regulation abilities, from as early as infancy

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(Holodynski & Freidlmeier, 2006). For example, warm and responsive parents tend to validate and empathize with children's emotions and teach children to problem-solve and regulate emotions in successful ways (Cunningham, Kliewer, & Garner, 2009; Eisenberg, Losoya, Fabes, Guthrie, Reiser, et al., 2001). In a study of second through fifth grade boys and girls, associations between observed parental warmth toward the child was directly linked with whether parents taught their children about emotion during a emotion-related laboratory task (Eisenberg, et al., 2001). Specifically, parents who "linked" others' emotions with their child's own emotional experiences (i.e., a method of emotion socialization) during the task also showed more warmth toward their children. Warmth was defined by positive emotions and behaviors directed towards the child, such as smiling, laughing, positive tone of voice, and affection. In addition, this same group of parents showed more positive emotional expressions in response to emotional stimuli, in the presence of their children, than other parents. This finding suggests that parent modeling of positive emotions is linked with healthy development of children's emotional understanding.

On the other hand, parental socialization behaviors that are disapproving or minimizing of children's emotions may contribute to unhealthy emotion regulation strategies. Studies have shown that punitive (e.g., yelling and hitting) or minimizing reactions to children's emotional displays of negative emotions led to maladaptive emotion regulation behaviors, such as suppression and avoidance (Eisenberg, Cumberland, & Spinrad, 1998). For example, parents who are overly negative or lack positive behaviors in their parent-child interactions tended to have children with more passive and controlled styles of emotion regulation (Feng, Shaw, Kovacs, Lane,

O'Rourke, & Alarcon, 2008). Longitudinal studies have supported these findings,

suggesting that parents' negative reactions to children's emotions lead to later emotion

regulation difficulties (Eisenberg, Fabes, & Murphy, 1996; Gottman, Katz, & Hooven,

1996). Because emotion regulation is critical to socio-emotional development, negative

parenting reactions to emotions can therefore contribute to lower levels of children's

social functioning (Jones, Eisenberg, & Fabes, 2002; Fabes, Leonard, Kupanoff, &

Martin, 2001). Laboratory studies further support the effects of socialization on the

development of emotion regulation abilities. A study by Tenenbaum, Alfieri, Brooks,

and Dunne (2008) indicated that teaching young children about emotions, through

emotion-related vignettes, significantly improved their emotion understanding within

four weeks. Several other studies have also indicated that parents' active teaching of

emotion regulation strategies improved children's coping abilities (e.g., Morris, Silk,

Steinberg, Myers, & Robinson, 2007; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002;

Eisenberg, et al., 2001). Similarly, a study by Denham and colleagues (2000) found

preschoolers with mothers who respond to their behaviors and emotions in adaptive

ways, such as by teaching emotion regulation strategies, displayed healthier emotional

functioning in later childhood. Conversely, preschoolers with mothers who primarily

modeled anger in response to challenging situations later expressed greater levels of

negative emotions and behaviors (Denham et al., 2000).

Parenting practices and children's internalizing disorders

Parenting practices also have been shown to make important contributions to

children's current and later psychological well-being. In a recent meta-analysis of 45

studies, McLeod, Weisz, and Wood (2007) found that parenting directly accounted for at

least 8% of the variance in childhood depression (current and lifetime). Specifically, they found that parents' hostility toward their children was most strongly linked to depression. "Parental hostility" was defined as low levels of warmth combined with high levels as negative reactions to the child behavior (e.g., harsh criticism). Low parental warmth also has been linked to later child depressive symptoms (e.g., Hipwell, Keenan, Kazra, Loeber, et al., 2008). In a recent study by Bayer and colleagues (2010), internalizing symptoms at age 7 were strongly predicted by parenting variables at age 2. Specifically, children of parents that scored low on the "warm-engaged" parenting variable showed higher levels of internalizing behaviors over time. Examples of warm-engaged parenting behaviors included giving hugs to the child and making positive statements to the child about the parent-child relationship. Similarly, Garber and Flynn (2001) identified parental rejection, such as expressing high levels of disapproval and criticism, as a causal factor in the development of childhood depression. A study by Krause, Mendelson, and Lynch (2003) examined the long-term effects of parents who respond to children's negative emotions with distress, and negative parenting behaviors (e.g., parental punishment, minimization) in childhood. They found that these parenting behaviors were associated with chronic suppression and avoidance in adulthood, which significantly predicted depression and anxiety symptoms.

In a recent study of maltreated children, Robinson and colleagues (2009) found that for both maltreated and non-maltreated children, parental anger was associated with greater internalizing symptoms in their children; on the other hand, positive parental affect was associated with decreased internalizing symptoms. Similarly, a six-year large-scale prospective longitudinal study, Hipwell and colleagues (2008) showed that parents'

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use of harsh punishment methods, such as yelling and spanking, predicted later depressed mood in children. Parental practices that involve excessive control have been shown to play a critical role in children's development of depression (Garber & Flynn, 2001) and anxiety disorders (Hannesdottir & Ollendick, 2007). Overly controlling behaviors include excessive regulation of children's actions, thoughts, and feelings (Garber & Flynn, 2001). A similar parenting variable, "overinvolved" parenting, has been found to strongly predict internalizing symptoms from age 2 to age 7 (Bayer, et al., 2010). Overinvolved parenting included trying to protect the child from as many of life's difficulties as possible, often by using very high levels of rule-setting behaviors.

Integrating contributions of emotion regulation, parenting, and child gender

Thus far, several different factors have been linked to the development of children's internalizing problems; however, little is known about the particular *mechanisms* underlying these associations. For example, despite the number of intraindividual emotion regulation variables identified as critical in the development of later psychopathology, attention to the complex interaction between parenting and emotion regulation may be particularly informative. Parenting factors likely affect the development of emotion regulation skills, and also may be independently linked to later internalizing problems. However, while negative parenting practices have been shown to have several *direct* effects on both children's internalizing symptoms and emotion regulation development, they may also *indirectly* influence later psychopathology through more complex relationships.

First, parenting behaviors may influence internalizing symptoms via their effects on children's maladaptive emotion regulation development. That is, an indirect linear

relationship between intrinsic temperamental variables and extrinsic parenting style

variables may contribute to later psychopathology (Fox & Calkins, 2003). For example,

Morris and colleagues (2007) found that parental encouragement of suppression and

avoidance of negative emotions increases children's risk for depression. A study of

African-American school-aged children showed that for boys, emotion regulation

abilities mediated the relationship between parental socialization and internalizing

symptoms (Cunningham, Kliewer, & Garner, 2009). Parental emotion socialization was

measured using variables such as mothers' recognition of their own and their child's

emotions, teaching children to recognize their emotions, and healthy coaching for

handling negative emotions. Therefore, parents who taught boys to recognize and cope

with emotions in healthy ways were strongly linked with children who had lower levels

of internalizing symptoms, *only for* boys who responded to emotions appropriately.

Second, parents may socialize children in different ways, which may lead to

differential psychopathological outcomes. For example, children who are

temperamentally prone to negative emotionality may elicit more negative parenting

behaviors than others (Rothbart & Bates, 2006), which may in turn lead to both

internalizing and externalizing behaviors (Paulussen-Hoogeboom, Stams, Hermanns,

Peetsma, & Wittenboer, 2008). Moreover, while children whose parents react to

emotions in punitive or minimizing ways tend to experience maladaptive outcomes, those

who are prone to negative emotionality tend to experience *worse* outcomes and less

socioemotional competence (Jones, Eisenberg, Gabes, & MacKinnon, 2002).

A child's gender also plays a role in parental socialization. Differential gender

socialization involves teaching children to express or suppress emotions based on

culturally-based gender norms (Eisenberg, Cumberland, & Spinrad, 1998). As discussed in previous sections, parents may be more likely to socialize girls to overregulate negative emotions, through suppression or masking with more socially-appropriate emotions (e.g., Chaplin, Cole, & Zahn-Waxler, 2005; Garner & Power, 1996). However, adopting emotion regulation techniques based on gender norms can lead to maladaptive outcomes for certain groups. Bromberger and Matthews (1996) found that girls who suppressed their angry emotions showed more depressive symptomatology in adulthood. A longitudinal study by Feng et al. (2009) found that for girls only, emotion overregulation predicted later depressive symptoms, *if* their parents used highly controlling parenting behaviors; this finding suggests that a more complicated transactional association exists. All of the findings described in this section highlight the importance of considering child gender as potential factor that may have effects on each variable, as well as on the complex relationships among them.

Conclusion

In conclusion, research has supported the importance of understanding specific early precursors of child internalizing problems, particularly given the moderate stability of these problems over time (e.g., Keenan et al., 2009; Luby et al., 2009). Early problems with emotion regulation play a critical role in children's development and psychopathology (Shaw et al., 1997). Emotion dysregulation can be viewed on a continuum ranging from underregulation to overregulation; literature suggests that overregulation may be more commonly associated with internalizing outcomes (Keenan et al., 2009). Factors such as strategy use (e.g., suppression, masking) and social context (i.e., social appropriateness of the strategy) may be important to examine when

measuring overregulation (Cole, Michel, & Teti, 1994a). Existing studies of emotion

dysregulation, however, have primarily measured more general regulatory abilities via

secondary- and self-report questionnaires (Cole, Martin, & Dennis, 2004). Gender is

likely a critical variable in the relationships between emotion overregulation and

internalizing, and early precursors predicting later gender-differentiated patterns of risk

may exist (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). In particular, females

consistently have shown higher rates of internalizing symptoms by early adolescence that

increase rapidly with age (Cole et al., 2002).

Researchers have also argued that parenting practices are important in the

development of child internalizing. Parental hostility (e.g., anger) and low parental

warmth have been independently linked to later child depressive symptoms (e.g., Hipwell

et al., 2008). With regard to particular longitudinal mechanisms in children's

development of internalizing problems, parenting factors likely affect the development of

emotion regulation skills, and also may be independently linked to later internalizing

problems. Negative parenting behaviors appear to directly affect children's internalizing

symptoms and emotion regulation development, but they may also indirectly influence

later adjustment through more complex relationships such as differential gender

socialization (Eisenberg, Cumberland, & Spinrad, 1998). Finally, existing literature also

has demonstrated value in using ratings from multiple informants to assess children's

behaviors in different settings (e.g., home, school), as contextual differences in child

adjustment over time often exist (Kerr et al., 2007).

The Present Study

Specific aims. The first aim of the present study was to develop a clear operational definition of emotion overregulation and to examine the relation of this construct to psychopathology. There currently exists a lack of agreement on operational definitions of emotion overregulation, and existing research on the construct is sparse and very mixed. In addition, while significant research exists on emotion dysregulation precursors of childhood behavior problems (e.g., Cole, Hall, & Radzioch, 2009), relatively little is known about emotion overregulation as a precursor of internalizing disorders. In the present study, the paucity of research on constructs of emotion overregulation was addressed by first measuring suppression and masking behaviors using a laboratory-based assessment of spontaneous emotion regulation behaviors, the Disappointment Task (Saarni, 1984). Coded facial expressions of emotion (i.e., joy, sadness, and anger) in response to disappointment from the videotaped task were examined across social contexts (i.e., alone and with examiner). Because existing studies of emotion overregulation often use one method in a single context when measuring the construct, the present study used a multi-method, multi-contexual approach to operationalizing emotion overregulation. Teachers' reports of children's emotion overregulation behaviors were used as secondary reports of behavior, and mothers' and teachers' reports of children's shy/inhibited temperaments served as temperament measures related to emotion overregulation.

The second aim was to examine the mechanisms through which emotion overregulation and negative parenting behaviors influence children's internalizing problems. Few existing studies have examined preschool-age precursors of later internalizing behaviors. Instead, most have focused on later developmental age ranges

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(e.g., Green et al., 2008), despite the importance of identifying early childhood risks in predicting later emotional problems, and subsequently, in improving treatment and prevention efforts. In addition, while outcomes of emotion underregulation behaviors across time have been examined in several studies (e.g., Cole, Hall, & Radzioch, 2009), relatively little is known about longitudinal relationships between emotion overregulation and later internalizing symptoms. The few existing findings have been inconclusive, and longitudinal examination of data from the Disappointment Task is currently missing from the literature. The present study attempted to address these research gaps by using structural equation modeling to examine longitudinal parenting and emotion dysregulation predictors from preschool and kindergarten ages to kindergarten-age internalizing outcomes. Tests of mediation were also included in the model, to examine more complex potential relationships between parenting, emotion dysregulation, and internalizing. Given the many contributing factors and numerous possibilities of complex relationships, the present study attempted a clearer examination of these patterns to identify specific mechanisms in the development of internalizing problems.

The third aim was to examine potential differences in outcomes between home and school contexts. Studies have shown that informants from multiple social contexts likely identify different levels and types of children's behavioral problems (e.g., Keenan et al., 2004). However, based on a growing consensus, these variations likely reflect true differences across diverse contexts rather than measurement errors (Achenbach & Rescorla, 2001; Grietens et al., 2004; Hinshaw & Nigg, 1999; Kerr, Lunkenheimer, & Olson, 2007). Therefore, examining contexts separately may provide more complete and accurate assessments of children's functioning. The present study represents an attempt to

address these issues by separately analyzing and comparing structural equation models for teacher- and mother-reported internalizing outcomes.

The fourth aim was to contribute to our understanding of gender differences in children's emotion regulation, parenting behaviors, and internalizing behavior problems, and the relations among these variables. Existing research suggests that gender differences within each of these variables likely exist (e.g., Keenan & Hipwell, 2005), but few investigators have simultaneously assessed these complex risk factors in transactional, longitudinal models. In addition, findings are mixed regarding early childhood ages and regarding when these differences begin to emerge. Differential parent socialization may also exist, suggesting that parenting behaviors may be different between genders or may affect genders differently (Eisenberg, Cumberland, & Spinrad, 1998). Therefore, in the present study, child gender was tested as a potential moderator within the hypothesized models.

Research questions and hypotheses. The present study was designed to answer the following questions:

1) Are different measures of children's emotion regulation (ER; i.e., laboratory behavior, secondary reports of behavior, temperament) during kindergarten differentially related to child internalizing problems? This research question was partly exploratory, as the present study was among the first attempts to operationalize the construct of emotion overregulation using multiple measures and informants (e.g., lab behavioral data, secondary reports of behavior, secondary reports of temperament), as well as to model this construct over time. Since overregulation has been conceptualized as a form of dysregulated emotion which has been associated with maladaptive outcomes (e.g.,

Keenan & Hipwell, 2005), it was hypothesized that both behavioral and temperament measures of emotion overregulation during kindergarten will be significantly linked with internalizing problems. Figure 1 shows the conceptual ER path model, which includes only emotion regulation-related predictors in preschool and kindergarten.

2) How do negative parenting behaviors and children's emotion dysregulation during preschool and kindergarten-aged periods directly and indirectly predict internalizing behaviors during kindergarten? Existing research suggests direct links between negative parenting and later internalizing problems (McLeod, Weisz, & Wood, 2007), as well as between emotion dysregulation and internalizing problems (e.g., Keenan, Hipwell, Hinze, & Babinski, 2009). Therefore, it was hypothesized that in the present model, direct relationships will exist between each of these variables and later internalizing problems in kindergarten. Due to the paucity of existing research examining indirect, transactional pathways in the development of children's internalizing behaviors, specific hypotheses regarding indirect relationships were more difficult to generate. However, extant research does suggest the important role of parenting in children's emotion socialization and development of emotion regulation abilities. Therefore, it was hypothesized that negative parenting behaviors during preschool and kindergarten will be related to children's internalizing problems in kindergarten through children's emotion dysregulated behaviors. That is, it was predicted that emotion dysregulation will mediate the relationship between negative parenting and later internalizing problems in children. Figure 2 shows the conceptual full path model. Hypothesized direct effects are depicted with bold lines, and hypothesized indirect effects are depicted with dashed lines. The conceptual full path model is an expanded version of the conceptual ER path model.

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3) How do children's emotion regulation abilities, parenting practices, and internalizing symptoms change or remain stable over the preschool-to-kindergarten age transition? Are there identifiable patterns to these relationships? Research on internalizing problems in childhood has found them to be moderately stable over time (e.g., Keenan et al., 2009; Luby et al., 2009). Findings for emotion regulation abilities over time are more mixed, although certain components of emotion regulation may be more stable than others. For example, shy temperament has been found to be moderately stable from early to mid childhood ages (Sanson et al., 1996). Negative parenting practices may also show stability over time (e.g., Metzler, Biglan, Ary, & Li, 1998), although findings for early childhood periods are limited. Same-variable relationships from preschool to kindergarten will be examined in the conceptual full path model (Figure 2) in order to test for stability. It was hypothesized that internalizing symptoms and emotion regulation-related temperament variables will remain stable over time. However, due to the limited and mixed literature, specific hypotheses could not be generated for emotion regulation behavioral variables and negative parenting behaviors.

4) Do these aforementioned relationships differ by social context (i.e., school and home)? Extant literature suggests that ratings by multiple informants allows for assessment of true differences in children's behavioral problems that vary according to social contexts (Achenbach & Rescorla, 2001; Grietens, Onghena, Prinzie, Gadeyne, Van Assche, et al., 2004; Kerr, Lunkenheimer, & Olson, 2007). In a study by Grietens and colleagues (2004) examining comparisons of multi-informant reports of child behavior problems, agreement was found to be lowest between mothers and teachers, particularly on internalizing behavior problems. Similar results were found for inter-rater agreement

on internalizing behaviors in a sample of 11-18 year olds (Salbach-Andrae, Lenz, & Lehmkuhl, 2009). Therefore, in order to examine children's behavioral adjustment over time, in a range of social and environmental contexts, the general full path model (Figure 2) will be examined separately for mother- and teacher-reported internalizing outcomes. Based on the above findings, it was hypothesized that the relationships will differ according the informant, due to behavioral differences in varying social contexts.

5) How well do emotion dysregulation and negative parenting variables in preschool (Time 1) and kindergarten (Time 2) predict internalizing behaviors in children during the late school age period (Time 3)? In the present study, separate prediction models were created to examine relationships between predictors and outcomes in Times 1, 2, and 3. Figure 3 shows the three conceptual prediction models for Time 3 outcomes, with predictor sets of T1, T2, and T1 and T2 combined. It was hypothesized that the T1 and T2 set will be a better predictor to W3 outcomes than information from single time points, due to accumulated effects across development. To investigate potential differences in predictive models between informants, the three models will be examined separately for mother- and teacher-reports of internalizing behaviors.

6) Do these aforementioned relations differ by child gender? In general, the extant research suggests that gender differences may exist in parental socialization (e.g., Eisenberg, Cumberland, & Spinrad, 1998) and internalizing behavior problems (Cole et al., 2002; Keenan & Hipwell, 2005). However, it is less clear whether gender plays a role in children's emotion regulation abilities. It is also unclear when gender differences begin to emerge in early childhood (Archer & Lloyd, 2002). To address questions regarding possible gender differences and to clarify the emergence of these differences in the

present study, multiple-group analyses will be conducted using the conceptual full path

model (Figure 2) and conceptual prediction models for Time 3 outcomes (Figure 3). It

was hypothesized that gender would serve as a moderator in the relationships between

emotion dysregulation, negative parenting, and internalizing at 3, 6, and 10 years of age.

CHAPTER II

METHOD

Participants

        Participants were 235 children (113 girls) and their parents and teachers who were

part of a longitudinal study of young children at risk for school-age conduct problems

(Olson & Sameroff, 1997). Most families (95%) were recruited from newspaper

announcements and fliers sent to day care centers and preschools, and the rest were

referred by preschool teachers and pediatricians. In order to recruit toddlers with a range

of behavioral adjustment levels, two different ads were placed in local and regional

newspapers and child care centers; one targeted hard-to-manage toddlers, and the other

targeted normally developing toddlers. A screening questionnaire and brief follow-up

telephone interview were used to determine each interested family's appropriateness for

participation in the longitudinal study. Exclusion criteria included children with serious

chronic health problems, mental retardation, and/or pervasive developmental disorders, as

well as those from families in the initial stage of divorce or experiencing severe economic

hardship.

        Participants included an overrepresentation of toddlers in the medium-high to

high range of the Externalizing Problems scale of the Child Behavior Checklist/2-3,

based on mothers' report (CBCL/2-3; Achenbach, 1992). At recruitment, children

represented the full range of externalizing symptom severity on the CBCL/2-3: based on

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CBCL/2-3 scores, 39% of the sample was 1 SD above the mean (T scores>60), 30% were up to 1 SD above the mean (50<T<60), and 31% were below the mean (T<50). Teachers' [$F_{(2, 184)} = 3.70$, $p < .05$)] ratings of externalizing behaviors for these three initial risk groups paralleled mothers' ratings in expected directions.

Children were assessed at three time points over approximately seven years: 1) **age 3** (T1; N=235, age range = 27 to 45 months, M = 37.7, SD = 2.7 months); 2) **age 6** (T2; N = 199, age range = 60 to 80 months, M = 68.87, SD = 3.8 months); and 3) **age 10 ½** (T3; N=197, age range = 8.5 to 11.8 years, M = 10.4, SD = 0.6 years). At T2, all children in the study had made the transition to kindergarten. At T3, all children were attending grade school. Participants who had dropped out of the study across the three time points did not differ demographically (i.e., gender, socioeconomic status, cognitive ability) from the rest of the sample.

Families were representative of the local population in regard to racial/ethnic background, single/two-parent households, parent education, and socioeconomic level. Most children were of European American heritage (86%); others were African American (5%) or biracial (9%). The majority of mothers indicated that they were married (89%), 3% indicated that they were living with a partner, 5% identified themselves as single (never married), and 3% as separated or divorced. Fifty-five percent of the mothers worked outside the home full-time. Eighteen percent of mothers and 22% of fathers had received high school educations with no further educational attainment; 43% of mothers and 32% of fathers had completed four years of college with no further training; 39% of mothers and 46% of fathers had continued their education beyond college in graduate or professional training. The median annual family income was

$52,000, ranging from $20,000 to over $100,000. Families had mean scores of 7.58

(range = 2-9, SD = 1.59) on Hollingshead's (1975) occupational scale, indicating that the

majority of parents' occupations fell into the minor professional category.

<u>Procedure</u>

Home assessment. Mothers, fathers, and children were administered

questionnaires and assessments in their homes by a female social worker in T1 and T2

data collection periods. In the first two hours of the home assessment, parents responded

to a set of semi-structured interview questions adapted from that used by Dodge and

colleagues in the Child Development Project (Dodge, Pettit, & Bates, 1994). Following

the interview, the parent-child dyad participated in a series of different assessments,

including one session of free play. After the home assessment, parents were provided a

packet of questionnaires about their child's temperament and adjustment to fill out in

their own time and to return by mail or experimenter pick-up. Participating families were

given $100 for each of the first two waves of data collection (T1, T2). T3 data collection

only involved parents' self-report questionnaires, and participating families were

provided with a $25 gift certificate to a local establishment of their choice.

School assessment. For T1, T2, and T3 data collection periods, children's current

teachers contributed ratings of their behavioral adjustment. Teachers were mailed a

questionnaire packet, which was returned by mail or picked up by an experimenter. They

were given $20 gift certificates to a local bookstore for their participation in each of the

first two waves (T1, T2). Teachers who participated in T3 data collection were provided

with a $10 gift certificate. Participants usually, but not always, possessed both mothers'

and teachers' report data at certain timepoints. However, those who had both mother- and

teacher-ratings of internalizing behaviors (T1, T2, & T3) did not differ in makeup from those whose teacher-ratings were missing (i.e., on variables including child gender, socioeconomic status, and cognitive ability).

Lab assessment. At T1 and T2, children participated in a three-hour Saturday morning laboratory session. These sessions took place at a local preschool for T1 and in the research laboratory for T2. During the lab sessions, children were evaluated by graduate students and advanced undergraduate examiners who administered individual assessments (see Olson, Sameroff, Kerr, Lopez, & Wellman, 2005, for details). Following 20-30 minutes of rapport building, measures of temperament, emotion regulation, and cognitive ability were individually administered. The Disappointment Task, which is examined in the current study, was administered during the laboratory assessment session. Children received small gifts for their participation.

Measures

Emotion regulation

Lab assessment of emotion dysregulation. Individual differences in emotion regulation were assessed using the Disappointment Task (Saarni, 1984), which was administered in the preschool (T1) and laboratory (T2) as part of the three-hour Saturday lab assessment. This measure of emotion regulation uniquely combines observation with laboratory manipulation and assesses spontaneous emotion regulation of disappointment in children as young as age three. A unique characteristic of this task is that it allows for observation of both children's social and nonsocial emotional expression, which helps to determine the levels and contexts of their emotion dysregulation and masking.

In the Disappointment Task paradigm, the child is told that he/she would receive a desirable gift (based on a prior rank-ordering by the child) by an experimenter but instead is given a very undesirable gift. An advanced graduate student examiner first asks the child to rank-order five toys, which range from desirable (e.g., bracelet, sheriff's badge) to undesirable (e.g., old paper clip). After writing down the ordered choices, the examiner then tells the child that his/her favorite toy would be given to him/her by a second examiner. The examiner left the room, and the second examiner promptly entered to give the child his/her least desirable toy, without indicating that anything was amiss.

The child was videotaped throughout the task. Emotional expressions were measured during the rank-ordering procedure to determine baseline levels of emotional expression. After the ranking procedure, the task was divided into two segments according to social context. In the social segment, the child was also videotaped for approximately 60 seconds with the undesirable toy while the second experimenter was present. To minimize potential cues, the second examiner did not interact with the child. In the non-social segment, the second examiner left the room, and the child was left alone with the toy for approximately 60 seconds. After the nonsocial segment, the original examiner returned, claimed that there was a mistake, and offered to exchange the undesirable toy with the most-desired one.

Emotional expressions were coded using a facial coding procedure based on Cole, Zahn-Waxler, and Smith's (1994) affect coding system, which was influenced by the work of Ekman and Friesen (1978) and Izard (1979). Three basic emotions were coded for each participant: one positive emotion (joy) and two negative emotions (sadness and anger). Coding cues for joy included upward lip corners, raised cheeks, and wrinkling

around the eyes (see Table 1 for summary of anchors). Coding cues for sadness included downward lip corners, protruding lower lip, raised inner brows, and lowered outer brows. Coding cues for anger included drooped, tightened, and narrow eyelids, set mouths and jaws, tightened lips, and clenched teeth.

Frequencies of joy, sadness, and anger expressions were calculated for each 10-second time interval. Baseline measures of emotion expression were coded during the initial toy-ranking procedure (i.e., before disappointment). Videotapes were coded by three trained and reliable advanced undergraduate research assistants (kappas for inter-rater reliability ranged from .75 - .84 for all combinations of coders). After controlling for baseline responding, the child's expressive behavior in both social and non-social segments were used to obtain measures of emotion dysregulation (Saarni, 1984). Because the number of time intervals for each segment (including baseline) varied slightly for each individual, percentage scores were calculated (i.e., frequency of an emotion/number of time intervals X 100).

Teacher report of emotion regulation and emotion regulation-related temperament. The child's emotion regulation in school was assessed in T2 and T3 using Shields and Cicchetti's (1997) Emotion Regulation Checklist (ERC). The ERC was not used in T1, as the questionnaire is validated for children ages 6 to 12. The ERC is a teacher-report form comprised of 24 items in which teachers scored the child on a 4-point Likert scale, from 1 ("Never") to 4 ("Almost always"). For example, statements include, "shows positive feelings in response to neutral or friendly acts by peers" and "shows the kind of negative feelings you would expect when other kids are mean, aggressive, or intrusive towards him/her." Two dimensions were created from scores on the ERC:

Emotion Regulation and Lability/Negativity. The Emotion Regulation dimension was

created from 8 items which measure empathy, self-awareness of emotion, and

appropriateness of emotional displays. Higher scores on the Emotion Regulation scale

reflected greater regulatory abilities. The Lability/Negativity dimension reflects

temperament-related behavior such as mood swings, angry reactivity, and intensity of

positive and negative emotions. The ERC has been shown to differentiate between well-

regulated and dysregulated groups and between maltreated and nonmaltreated children,

as well as reflecting convergence with established measures of affect regulation.

Parent report of emotion regulation-related temperament. An abbreviated

version of Rothbart's Child Behavior Questionnaire (CBQ; Ahadi, Rothbart, & Ye, 1993)

was used to assess parent's perceptions of child temperament at T1 and T2. Mothers

were administered the questionnaires by study examiners during home assessments. The

CBQ is widely used to assess 15 dimensions of temperament in children between ages 3

and 7, including Shyness and Inhibitory Control. Three superfactors also have been

reliably identified from the CBQ: Negative Affectivity, Surgency Extraversion, and

Effortful Control.

Parenting

Warm Responsiveness. Mothers completed the Parenting Dimensions Inventory

(PDI; Power, Kobayashi-Winata, & Kelley, 1992) for T1 and T2. Two subscales were

derived from the PDI to construct the latent factor of Warm Responsiveness. Mothers

rated their personal views or behaviors regarding parenting practices on a 6-point scale

("1"=not at all descriptive of me; "6"= highly descriptive of me) for the items that

constituted the Nurturance (6 items such as "My child and I have warm intimate moments

together") and Responsiveness (4 items such as "I encourage my child to express his/her opinion") subscales which consisted of Warm Responsiveness.

Punitive Discipline. During the home interview in T1 and T2, mothers responded to the Harshness of Discipline Scale (Dodge, Pettit, & Bates, 1994) which assessed the frequency with which each parent had physically disciplined their child (e.g., spank, grab, shake) during the last three months. Responses were rated on a 5-point scale ("0" = never, "1" = once a month, "2" = once a week, "3" = every day, and "4" = several times a day). When mothers circled two adjacent values, the average was taken as the response (e.g., 1.5 = between once a month and once a week). Each parent's use of physical punishment were relatively low in frequency (range=0-4, M=1.06, SD=.87 for mother's report of her own use of physical discipline; range=0-3, M=.69, SD=.81 for mother's report of the father's use of physical discipline). However, research suggests that children experience greater degree of physical discipline from both parents combined compared to either parent alone (Nobes & Smith, 1997). Therefore, to measure how often a child received physical punishment from either parent, we created a rank-order scale based on mother's responses. Thus, the lowest rank (rank=0) was given to children who received no physical discipline from either their mother or father (scores = 0 and 0). According to mothers, 23% of the children were in this group. The next lowest rank (rank=1) was assigned to children who had received punishment from one parent between "once a month" and "never" and no punishment from their other parent (scores = 0.5 and 0). The rank 2 was given to children who received scores of 0.5 and 0.5. A total of 36 rankings were made based on the responses in this sample. Children who had experienced physical discipline from both parents several times a day were ranked the highest (rank=36).

Child's internalizing behavior problems

Child Behavior Checklist: Mother's report. The Child Behavior Checklist (T1: CBCL/2-3, T2 & T3: CBCL/6-18; Achenbach, 1992; Achenbach & Rescorla, 2001) is a measure of behavioral and emotional problems in childhood and was used to assess parents' ratings of children's internalizing behaviors. Mothers completed the CBCL at T1, T2 and T3. Each time, they rated their child on items [approximately 100 items for each version of the CBCL] that describe the child's behavior currently or within the past 2 months (CBCL/2-3) or 6 months (CBCL/6-18). Each item is rated on a 3-point scale ("2"=very true or often true of the child; "1"=somewhat or sometimes true; "0"=not true of the child). There are two broadband, factor-analytically derived dimensions of child problem behavior, Internalizing and Externalizing. In this study, only internalizing scores were included in the analysis.

Teacher's Report Form: Teacher's report. The Teacher Report Form (T1: CTRF/2-5, T2 & T3: CTRF/6-18; Achenbach, 1997; Achenbach & Rescorla, 2001) is the teacher version of the CBCL and was used to assess teachers' ratings of children's internalizing behaviors. Teachers completed age-appropriate CTRFs at all three time points. The CTRF/2-5 and CTRF/6-18 have the same response format and share many of the same items with the CBCL/2-3 and CBCL/6-18. The content of some items varies depending on the form, to capture developmental changes and behaviors more typical of specific settings. Similar to the CBCL, sums of items on the Internalizing scale were used to represent teachers' report of children's internalizing problem severity. The average test-retest reliability was .90 at 8.7 day interval for CTRF/2-5 and 95 at 7 day interval for CTRF/6-18 (Achenbach, 1997; Achenbach & Rescorla, 2001).

Data Reduction

Prior to analysis, several potential emotion regulation variables were examined for model suitability, and composite variables were created for model parsimony. First, the construct of emotion overregulation was operationalized, a process which included the creation of a behavioral variable using data from the Disappointment Task. Second, emotion overregulation variables were selected based on both theoretical principles and descriptive statistics. Third, composite variables were created, as guided by relevant literature and theory, in order to increase model parsimony.

Creation of suppression/masking variable. Operationalization of emotion overregulation occurred in several stages. In the first stage, a new variable was created from Disappointment Task data. To do this, types of overregulation of negative emotion to target for analyses were first determined. Based on existing literature examining the minimization of negative emotions (e.g., Campos et al., 1994), two types of techniques were relevant: suppression and masking. The technique of suppression involved decreasing one's levels of expressed negative emotion, while masking involved substituting negative emotions with another, more socially-acceptable emotion (i.e., joy). Then, in order to measure overregulation, participants were divided into three groups for each emotion variable (i.e., joy, sadness, anger), for both disappointment conditions (i.e., with examiner and alone). Therefore, participants' emotional responses were re-coded categorically for each social context. Examination of emotion variables revealed a high percentage of participants (over 50%) with a lack of emotional expression on one or more variables. Therefore, groups were defined as zero, medium (i.e., between zero and high),

and high (i.e., top 25th percentile of frequency scores), for each of the three emotion variables.

Lastly, categorical emotion variables that accounted for social contextual factors were used in definitions of overregulation groups. Suppression was defined as showing no negative emotions in response to disappointment in both social and alone conditions. Masking was defined as showing medium or high levels of joy in the social condition, showing no negative emotions in the social condition, and showing medium or high levels of negative emotion in the alone condition. Suppression was therefore considered a sub-category of masking; children who masked their emotions also suppressed them, although children who suppressed did not necessarily also mask.

Descriptive analyses revealed an N of 9 for the Suppression-Only group, and an N of 17 for the Masking-Only group. Because sample sizes were relatively low, the suppression and masking groups were collapsed to create an overall overregulation group with a total sample size of 26. Combining the two variables was also justifiable given that suppression is a sub-category of masking (i.e., based on group definitions, children who masked also suppressed). After collapsing groups, the study sample was re-coded into a binary overregulation variable based on group membership.

Bivariate correlations. In the second stage of operationalizing emotion overregulation, bivariate correlations between potential predictor and outcome variables were examined. The four outcomes variables in analyses were internalizing problem behaviors reported by mothers and teachers during preschool and kindergarten. The six potential predictors were as follows: 1) the aforementioned suppression/masking variables created from the Disappointment Task (Times 1 and 2); 2) total expressions of

joy in response to disappointment (Times 1 and 2); and 3) difference scores accounting for social context (i.e., expressions when alone – expressions with examiner present) of joy in response to disappointment (Times 1 and 2). Bivariate correlations are presented in Table 1. Several significant correlations were found between potential predictor variables. Only one significant correlation existed between potential predictors and outcome variables: the above-created overregulation variable was significantly correlated with teachers' reports of internalizing during preschool (r = .183, *p < .05*).

Selecting emotion overregulation variables. Next, model variables for emotion overregulation were selected. Total joy in response to disappointment (Times 1 and 2) was selected as an indicator of emotion overregulation, specifically masking. Total anger and sadness in response to disappointment (Times 1 and 2) were also selected as measures of poor emotion regulation of negative emotion. Although the suppression/masking variable was significantly correlated with teachers' report of children's internalizing during preschool, it was excluded from the model due to the small n (26) and its binary nature.

Creation of composite variables. According to the law of parsimony, simpler models with fewer estimated parameters are more desirable. Simpler models from a set of similar models have greater explanatory power and are more likely to be replicable (Mulaik, James, Alstine, Bennett, Lind, & Stillwell, 1989). Therefore, in order to increase power for the hypothesized model in the present study, certain potential variables were reduced by creating composite variables. Prior to creating composites, bivariate correlations between potential components of composites were examined and described below.

Parenting composite variable. Parenting variables included maternal report of warmth/responsiveness (reverse-coded) and maternal report of frequency of punishment. Correlations between the two variables were moderate and significant correlations for Time 1 (r=.235, *p < .01*) and Time 2 (r=.354, *p < .01*). Therefore, composite Parenting variables were created by first standardizing the variables (to equate the scales), and then computing the mean of the standardized values.

Teacher report of emotion regulation/temperament composite variable. Teacher report of emotion regulation and emotion regulation-related temperament variables included teachers' ratings of children's emotion regulation abilities (reverse-coded) and children's lability/negativity during kindergarten. The correlation between the two variables was high and significant (r=.440, *p < .01*). Therefore, a composite variable reflecting teachers' reports of children's emotion regulation was created by first standardizing the variables (to equate the scales), and then computing the mean of the standardized values.

Negative emotions composite variable. Relationships between the total sadness and total anger variables in response to disappointment during the Disappointment Task were examined. Correlations were low and non-significant for both Time 1 (r=.005, *ns*) and Time 2 (r= -.094, *ns*). However, Negative Emotion composite variables were still created for theoretical reasons, as both are negative emotions resulting from disappointment. Because they are on the same scale, Negative Emotion composites for both Time 1 and 2 were created by calculating means of both variables.

CHAPTER III

RESULTS

<u>Overview and Analysis Plan</u>

The analytic plan of the present study was as follows. In the preliminary

analyses, the central tendency and variability of all study variables were computed. Mean

level differences by child gender also were tested using independent t-tests. Next,

bivariate correlations were computed for all of the emotion regulation variables

(behavioral and temperament), parenting variables, and child internalizing behaviors

reported by multiple informants at 3, 6, and 10 years. Correlations between study

variables also were computed separately for boys and girls.

For the main analyses, the proposed full structural model of relationships between

the study variables was evaluated with panel-data path analysis through structural

equation modeling (SEM), using AMOS 17.0 software (Arbuckle, 2008). The SEM

procedure allows testing of complex relationships, specified *a priori*, within the sample

data (Weston and Gore, 2006). Although SEM cannot prove causal relations between

variables, it determines whether causal inferences can be made within the dataset and

compares fit between models. SEM was conducted in multiple steps. First, the proposed

full structural model was constructed, based on the conceptual full model (Figure 2)

described in Chapter 1. Second, the proposed full model was evaluated using Maximum

Likelihood Estimation, the most commonly used estimation method for SEM (Kline

2010). Third, after examining model fit indices and consulting theoretical background, adjustments were made to the proposed model. Fourth, the resulting full modified model was evaluated for fit. Finally, multiple-group path analyses were conducted in order to evaluate the effects of gender on the relationships.

Prior to evaluating the full structural model, an additional ER structural model was constructed, based on the conceptual ER model (Figure 1) described in Chapter 1. This model examined emotion dysregulation-related variables that may be differentially linked with internalizing outcomes. These preliminary SEM analyses in AMOS were conducted to clarify relationships between a subset of the full model variables, and the ER structural model was a nested model within the full structural model.

Additional prediction models were also tested to examine links between Time 1 and Time 2 predictors and Time 3 outcomes. The three models consisted of: 1) Time 1 predictors on Time 3 outcomes; 2) Time 2 predictors on Time 3 outcomes; and 3) Time 1 and Time 2 predictors on Time 3 outcomes. Multiple regression analyses for these models were conducted using AMOS.

<u>Preliminary Analyses</u>

<u>Central tendency and variability</u>. Means, ranges, and standard deviations for all demographic variables, emotion regulation-related variables, and parenting composite variables are presented in Tables 2 and 3. Means, ranges, and standard deviations for children's internalizing behaviors reported by mothers and teachers at 3, 6, and 10 years are provided in Table 4. Specific findings are discussed in the sections below.

<u>Emotion regulation: Disappointment Task.</u> As shown in Table 3, preschool children during the Disappointment Task showed joyful affect behaviors in response to

disappointment, on average, in 4.85% (SD = 9.58; range from 0 to 77.5%) of the 10-second time intervals. They showed negative affect behaviors (i.e., sadness and/or anger) after disappointment on an average of 7.04% (SD = 10.70; range from 0 to 44.45%) of the total time intervals. At kindergarten age, children showed greater percentages of positive affect in response to disappointment, as compared with preschool ages, with an average of 7.95% (SD = 14.90; range from 0 to 100%) of the time intervals. They also showed greater negative affect after disappointment, with an average of 12.92% (SD = 13.32; range from 0 to 55.21%) of time intervals after disappointment. Therefore, all children's emotion behaviors in response to disappointment increased over time.

Emotion regulation: Secondary reports. As shown in Table 3, according to mothers' reports of preschool children's temperaments, children had an average score of 3.52 (SD = 1.23, range = 1 – 6.77) on the Shyness dimension of the Child Behavior Questionnaire (CBQ; Ahadi, Rothbart, & Ye, 1993). In kindergarten, children were rated as having an average Shyness score of 3.31 (SD = 1.24; range = 1 – 6.46), with values very similar to those from preschool-age ratings. The teacher-rated composite score, which included teachers' ratings of children's emotion dysregulation behaviors and children's emotion dysregulation-related temperaments on the Emotion Regulation Checklist (ERC; Shields and Cicchetti, 1997), was only available for the kindergarten time period. The average composite score was 0, with a range from -1.15 to 3.50 and a standard deviation of .848.

Index of negative parenting. The parenting composite score included maternal reports of frequency of punishment and lack of warmth/responsiveness on the Harshness of Discipline Scale (Dodge, Pettit, & Bates, 1994). As shown on Table 3, preschool

children received an average score of -.0043 (SD = .784; range = -1.08 – 3.19) for the negative behaviors composite. Kindergarten children received similar scores, with an average negative behaviors composite of -.0179 (SD = .849; range = -1.19 – 3.26).

Differences by child gender. As shown in Table 2, there were no significant gender differences in demographic variables. However, independent samples t-tests revealed some gender differences in the predictor variables, as presented in Table 3. Boys and girls received significantly different kindergarten teacher ratings of emotion dysregulation behaviors and temperament, as measured by the teacher-reported emotion dysregulation composite score ($t(190) = 2.54$, $p < .05$). Kindergarten-aged boys received an average score of 0.15 (SD = 0.88, range = -1.15 – 3.5), while kindergarten girls received a lower average score of -0.16 (SD = 0.79, range = -1.1 – 3.1). No significant gender differences were found for teacher-reported emotion dysregulation during preschool, however. Significant gender differences were also found for mother's report of negative parenting behaviors during preschool ($t(226) = 2.14$, $p < .05$), with boys receiving an average rating of 0.10 (SD = .85, range = -.99 – 3.19) and girls receiving a lower average rating of -0.12 (SD = .69, range = -1.1 – 2.2). Differences during kindergarten were marginally significant ($t(216) = 1.87$, $p < .07$), again with girls (M = -0.13, SD = .78, range = -1.2 – 2.7) receiving a lower average rating than boys (M = .082, SD = .90, range = -1.19 – 3.3). As shown in Table 4, there were no significant gender differences in mother or teacher reported internalizing behavior problem ratings.

Missing Data/Attrition. Attrition rates for the longitudinal study were relatively low. Between preschool and kindergarten age assessments, only 4% (N=10) of the original sample did participate, and 12% (N=29) provided partial data. Twenty families

moved out of state but continue to provide questionnaire data. Of the 10 families no longer in the study only 2 have refused participation due to lack of time; the other 8 withdrew due to family or child illness. Participation rates remained stable between kindergarten and late school-age assessments. Attrition was not selective based on our comparisons of major socio-demographic or study characteristics; that is, there was no coherent pattern to the missing data. Full information maximum likelihood (FIML) was used to account for missing data in parameter estimation and model tests.

   Non-Normality: Internalizing and Disappointment Task emotion regulation variables. The entire data set was first screened for univariate outliers. Very few outliers existed; only internalizing outcome variables (both mother and teacher variables) and certain emotion regulation variables for the Disappointment Task appeared to have outliers. Because the internalizing outcomes outliers were legitimate cases and did not appear to be a result of coding mistakes, we retained them in analyses to maintain our sample size. The distribution of emotion regulation variables for the Disappointment Task was examined further for non-normality, because traditional SEM methods assume that continuous variables in the model are normally distributed. After examining skewness and kurtosis indices for all emotion regulation variables, the distribution of total joy expressed in response to disappointment during preschool and kindergarten appeared non-normal, with above-average kurtosis values (Time 1: 18.41; Time 2: 14.83). Therefore, parameter estimation using bootstrapping was performed. A covariance matrix of the dataset was generated, and 2,000 bootstrap replications were performed, in order to estimate standard errors, p values, and confidence intervals. The significance value from testing the overall fit of the models was calculated using the

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Monte Carlo nonparametric method in AMOS. Biases between the two models were evaluated and examined; biases ranged from -.049 to .018. All biases were found to be insignificant (i.e., critical ratio < 1.96), suggesting that the kurtotic distribution of the total joy variables did not significantly affect results from the proposed model. Therefore, no corrections or transformations on the variable were conducted.

Bivariate correlations. First, bivariate correlations between all emotion regulation-related variables were performed and are presented in Table 5. Next, bivariate correlations analyses were conducted among ratings of children's internalizing behavior problems by mothers and teachers at T1, T2, and T3 (Table 6). Finally, bivariate correlations were conducted between all study variables, separately by child gender. The resulting correlation matrix is presented in Table 7 (girls' scores appear on the top half of the matrix, and boys' scores appear on the bottom half).

Within Disappointment Task data, positive affect shown in response to disappointment at kindergarten age was found to be negatively correlated with shy temperament at preschool (r = -.200, $p < .01$). This relationship was only significant for boys (r = -.201, $p < .05$). For both boys (r = .683, $p < .01$) and girls (r = .605, $p < .01$), shyness in preschool had a strong positive correlation with shyness in kindergarten, suggesting possible stability in the temperament variable over time.

Agreement among parents' and teachers' ratings of children's internalizing behaviors was low (significant correlations ranged from .162 to .348), which is typical of studies on children's internalizing behavior problems (Stanger & Lewis, 1993). Within-rater stability in mothers' ratings from T1 to T2 (r = .359, $p < .01$) and from T2 to T3 (r = .575, $p < .01$) was moderately strong. Agreement between teachers was weak

(correlations ranged from .14 to .21), which is expected given that children were rated by a different teacher at each time point.

Correlations computed separately by child gender revealed a several additional noteworthy relationships. Negative parenting behaviors were found to have moderately strong stability between T1 and T2, for both boys (r = .549, $p < .01$) and girls (r = .562, $p < .01$). For boys only, however, negative parenting during preschool was linked with teachers' reports of emotion dysregulation in kindergarten (r = .229, $p < .05$). Instead, for preschool girls only, negative parenting was linked with positive affect in response to disappointment (r = -.244, $p < .05$). Shyness during preschool and kindergarten had positive correlations with internalizing problems, across both raters and genders. For boys, shyness in preschool (r = .357 for mothers, r = .255 for teachers) and kindergarten (r = .292 for mothers, r = .219 for teachers) were linked with preschool internalizing only. For girls, shyness in preschool was linked with mother's reports of preschool internalizing only (r = .371, $p < .01$). However, shyness in girls during kindergarten was positively correlated with both kindergarten (r = .361 for mothers, r = .285 for teachers) and late school-age (r = .329, $p < .01$) internalizing, suggesting possible across-time links.

Teachers' reports of children's emotion dysregulation in T2 were positively correlated with internalizing behaviors for both boys and girls. For boys, they were linked with mothers' reports of internalizing in T2 (r = .278, $p < .01$) and T3 (r = .224, $p < .05$), and teachers' reports of internalizing in T2 (r = .396, $p < .01$) and T3 (r = .233, $p < .05$). For girls, they were only linked with mothers' reports of internalizing in T3 (r = .226, $p < .01$), and teachers' reports of internalizing in T2 (r = .437, $p < .01$) and T3 (r = .286, $p <$

.05). Negative parenting behaviors in T1 and T2 were also positively correlated with internalizing behaviors for boys and girls. For boys, significant links were found between negative parenting in T1 and mothers' reports of internalizing in T1 (r = .288, $p < .01$) and between negative parenting in T1 and teachers' reports of internalizing in T3 (r = .233, $p < .05$). For girls, significant links were found between negative parenting in T1 and teachers' reports of internalizing in T1 (r = .297, $p < .01$) and T2 (r = .262, $p < .05$), and between negative parenting in T2 and teachers' reports of internalizing in T2 (r = .404, $p < .01$). Based on the results of bivariate correlations computed separately for boys and girls, the two groups seemed to share similar patterns of linkages, but with small differences in regards to reporter and timeframe. Fisher r-to-z transformations were calculated for significant correlations above, to assess the significance of the difference between genders, but no significant differences were found.

Structural Equation Modeling.

ER model. After completing preliminary analyses, the ER structural model (Figure 4) was constructed based on the conceptual ER path model (Figure 1). The central features of the model were the direct links between Time 1 ER variables and Time 2 internalizing outcomes, and between Time 2 ER variables and Time 2 internalizing outcomes. All exogenous variables (i.e., Time 1 predictors) were correlated, and all residual variances (i.e., error terms) were assumed to be uncorrelated.

As suggested by the literature, the proposed SEM models were evaluated using a variety of fit indices, including those of absolute and relative fits (Bollen and Long, 1993). These included the traditional overall chi-square test of model fit (χ^2), the Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and

Akaike Information Criterion (AIC). A good fit is denoted by a statistically non-significant chi-square value, a RMSEA less than .05, a low AIC value, and CFI more than .90 (Kline, 2010; Marsh, Hau, & Wen, 2004).

The first structural model was designed to clarify the operationalization of emotion overregulation, a form of impaired emotion regulation (ER). To test the first hypothesis that both behavioral and temperament measures of emotion overregulation during kindergarten would be significantly linked with mother-reported internalizing problems, SEM analyses were run for the ER structural model (Figure 4). Figure 4 shows the standardized regression weights (unstandardized weights in parentheses) for each component relationship. Tests of model fit suggested that the fit of the proposed ER model was moderate (See Table 8, χ^2 (19) = 42.03, p < .01; CFI = 0.89; RMSEA = .07; AIC = 112.03). The chi-square test was significant, meaning that the estimate model was significantly different from the observed data; therefore, the proposed model did not fit the data. However, because chi-square is sensitive to sample size (i.e., smaller samples are more likely to have non-significant chi-square values), an alternative approach is possible for the current study. The normed chi-square, a ratio between chi-square and degrees of freedom (χ^2/df), of below five suggests reasonable model fit (Klein, 2005). The normed chi-square in this model was 2.2. The CFI, RMSEA, and AIC also indicate a moderate model fit. The squared multiple correlation (R^2), which indicates the amount of variance in kindergarten-aged (T2) internalizing behaviors explained by the model's predictor variables, was .257. Therefore, the model predictors explained 25.7% of the variance in mother's reports of children's internalizing behaviors at Time 2.

Next, resulting path coefficients were examined to identify any specific emotion overregulation variables that were more highly linked with later internalizing behaviors. As shown in Figure 4, the following variables significantly and positively predicted internalizing behaviors in kindergarten: 1) positive affective responses to disappointment, in preschool (β= .037, p < .01).; 2) positive affective responses to disappointment, in kindergarten (β= .022, p < .05).; 3) shyness in kindergarten (β= .642, p < .01).; and 4) teacher-reported emotion dysregulation behaviors in kindergarten (β= .862, p < .01). On the other hand, shyness in preschool and showing negative affective responses to disappointment were not significantly related to internalizing behaviors in kindergarten.

Full proposed model. The full structural model (Figure 5) was constructed based on the conceptual full path model (Figure 2). The central features of the model were the direct and indirect links between Time 1 predictors (i.e., negative parenting, emotion regulation behaviors, emotion regulation-related temperament), Time 2 predictors (i.e., negative parenting, emotion regulation behaviors, emotion regulation-related temperament), and Time 2 outcomes (i.e., internalizing behaviors). The indirect links represent the possible mediating role of emotion dysregulation behaviors on the relationship between negative parenting and internalizing problems. Again, all exogenous variables (i.e., Time 1 predictors) were correlated, and all residual variances (i.e., error terms) were assumed to be uncorrelated.

The full structural model tested the second hypothesis, which states that direct and indirect relationships would exist between negative parenting, emotion dysregulation, and children's internalizing problems. The specific indirect relationship tested was whether emotion dysregulation would mediate the relationship between negative parenting and

later internalizing problems in children. Figure 5 shows the standardized regression weights (unstandardized weights in parentheses) for each component relationship. Tests of model fit suggested that the fit of the proposed full model was moderate (See Table 8, χ^2 (25) = 53.76, p < .01; CFI = 0.908; RMSEA = .069; AIC = 157.76). Although the chi-square test was again significant, the normed chi-square (χ^2/df) in this model was 2.15. The CFI, RMSEA, and AIC also indicated a moderate model fit. The squared multiple correlation (R^2), which indicates the amount of variance in kindergarten-aged (T2) internalizing behaviors explained by the model's predictor variables, was .276. Therefore, the model predictors explained 27.6% of the variance in mother's reports of children's internalizing behaviors at Time 2. Compared with results from the ER model (Figure 4), the full structural model explained only 2% more of the variance in children's internalizing at T2.

Next, direct links between variables and outcomes were examined. As shown in Figure 5, the following variables significantly and positively predicted mother-reported internalizing behaviors in kindergarten: 1) negative parenting behaviors in preschool (β= -.962, $p < .05$); 2) positive affective responses to disappointment, in preschool (β= .028, p < .05); 3) positive affective responses to disappointment, in kindergarten (β= .020, $p <$ .05); 4) shyness in kindergarten (β= .949, $p < .01$); and 5) teacher-reported emotion dysregulation in kindergarten (β= .939, $p < .01$). Indirect links were also examined, to determine the possible presence of a mediation relationship. To test whether emotion dysregulation behaviors mediated the relationship between negative parenting and internalizing problems, significance of the component relationships were examined. Path coefficients showed a significant relationship between negative parenting behaviors in

preschool and internalizing behaviors in kindergarten (β= -.962, $p < .05$); however, no significant relationships existed between negative parenting in preschool and any emotion dysregulation variables in kindergarten.

To test the third hypothesis of whether the variables of emotion dysregulation, negative parenting, and internalizing behavior change or remain stable from preschool to kindergarten ages, significance of same-variable relationships across time were examined. Shyness in preschool was found to be significantly linked with shyness in kindergarten (β= .640, $p < .01$), suggesting that stability may exist over time. Also, internalizing behaviors in preschool were found to be significantly linked with internalizing behaviors in kindergarten (β= .266, $p < .01$). Negative parenting behaviors in preschool were also significantly linked with negative parenting behaviors in kindergarten (β= .609, $p < .01$). No significant stability relationships were found for emotion dysregulation behavioral variables, suggesting that these variables may change over the preschool-to-kindergarten transition.

To explore the fourth hypothesis that the relationships proposed in the full structural model would differ according to social context (i.e., home vs. school environments), the model was examined separately with teacher-reported internalizing outcomes. Results were then compared with the earlier models testing mother-reported internalizing outcomes. Table 9 presents a comparison of the standardized regression weights (unstandardized weights in parentheses) for mother vs. teacher reported internalizing behaviors for each model pathway. Tests of model fit suggested that the fit of the proposed full model using teacher-reported internalizing outcomes was moderate (See Table 8, χ^2 (25) = 51.774, p < .01; CFI = 0.895; RMSEA = .066; AIC = 155.77).

The normed chi-square (χ^2/df) in this model was 2.07, and the CFI, RMSEA, and AIC

also indicate a moderate model fit. Comparison between the fit of the mother-reported

internalizing model and that of the teacher-reported internalizing model showed that both

have moderate overall fits. Examination of the two models generally showed modest

differences between the magnitudes of the standardized path coefficients (Table 9).

Comparisons of squared multiple correlation values (R^2) showed a slightly greater

amount of variance explained by mothers' reports of kindergarten internalizing behaviors

(27.6%) than teachers' (21.0%) . Inspection of significant pathways between the two

models showed that while five direct links between predictors and mother-reported

internalizing outcomes were significant, only one significant direct link existed within the

teacher-reported internalizing model: teacher-reported emotion dysregulation behaviors

(β= 1.656, $p < .01$). In addition, no significant mediation relationships were found in the

teacher-reported internalizing model, although the negative parenting. Significant

stability relationships remained the same (i.e., shyness and negative parenting), given that

predictor variables were identical between the two models.

      <u>Full modified model</u>. After examining direct and indirect relationships and model

fit indices, small adjustments were made in an attempt to improve the full proposed

model. Because negative affective responses to disappointment at both ages were not

significantly linked with internalizing behaviors, the variable was excluded from the full

modified model to increase model parsimony. The full modified model is shown in

Figure 6.

      Similar to analyses for the full proposed model (above), the full modified model

was tested separately for mother- and teacher-reported internalizing behavior outcomes.

Examination of model fit indices and individual pathways did not indicate particularly

significant differences between the proposed and modified models, for both mother- and

teacher-reported outcomes. Tests of model fit of the full modified model using mother-

reported outcomes suggested a moderate model fit (See Table 8, χ2 (15) = 32.97, p < .01;

CFI = 0.939; RMSEA = .070; AIC = 110.97). The normed chi-square (χ2/df) in this

model was 2.20, and the CFI, RMSEA, and AIC also indicate a moderate model fit. Tests

of model fit using teacher-reported outcomes suggested a similarly moderate model fit

(See Table 8, χ2 (15) = 37.29, p < .01; CFI = 0.910; RMSEA = .078; AIC = 115.29). The

normed chi-square (χ2/df) in this model was 2.49, and the CFI, RMSEA, and AIC values

were very similar to those resulting from the mother-reported outcomes model.

Examination of the two models generally showed modest differences between the

magnitudes of the standardized path coefficients. Similar to analyses with the full

proposed model, comparisons of squared multiple correlation values (R^2) showed a

slightly greater amount of variance explained by mothers' reports of kindergarten

internalizing behaviors (26.2%) than teachers' (20.8%). However, neither of the two full

modified models explained more variance in internalizing outcomes than the two full

proposed models. That is, based on the above model fit indices and individual pathways,

modifications to the full proposed model did not appear to significantly improve model

fit or the amount of variance explained by model predictors. Therefore, the full proposed

model was retained for future analyses.

Prediction models. The three Time 3 prediction models (Figures 7, 8, and 9) were

constructed based on the conceptual Time 3 prediction models (Figure 3). Squared

multiple correlations (R^2) resulting from the three prediction models were examined. The

R^2 indicates the amount of variance in late school-aged children's internalizing behaviors explained by the model's predictor variables. To test the fifth hypothesis that the combined predictors from Time 1 and Time 2 will be best predict Time 3 internalizing outcomes, these three models were analyzed using multiple regressions in AMOS. In the Time 1 → Time 3 Prediction Model (Figure 7), Time 1 predictors alone explained 14.5% of the variance in mother's reports of children's internalizing behaviors at Time 3. In the Time 2 → Time 3 Prediction Model (Figure 8), Time 2 predictors alone explained 35.3% of the variance in mother's reports of children's internalizing behaviors at Time 3. In the Time 1 and Time 2 → Time 3 Prediction Model (Figure 9), Time 1 and Time 2 predictors together explained 40.0% of the variance in mother's reports of children's internalizing behaviors at Time 3. Therefore, out of the three Time 3 prediction models, Time 1 and Time 2 predictors together explained the greatest variance in mother's reports of internalizing behaviors at late school age.

For the Time 1 and Time 2 → Time 3 Prediction Model (Figure 9), regression coefficients between Time 1, Time 2, and Time 3 outcome variables were examined to determine individual predictors for children's internalizing behaviors over time. Preschool internalizing behaviors (Time 1) significantly predicted late school-age internalizing behaviors (Time 3; $\beta = .281$, $p < .01$). Negative parenting behaviors in preschool (Time 1) also significantly predicted late school-age internalizing behaviors (Time 3; $\beta = -1.33$, $p < .05$). In addition, teacher's report of children's emotion dysregulation at kindergarten age significantly predicted late school-age internalizing behaviors (Time 3; $\beta = 1.065$, $p < .05$). Interestingly, kindergarten internalizing behaviors (Time 2) significantly predicted late school-age internalizing behaviors (Time

3; β = .659, *p < .01*), suggesting that stability in internalizing behaviors may exist between preschool and late school ages. The two strongest relationships between T1/T2 predictors and T3 outcomes (based on an examination of standardized regression coefficients) were kindergarten (standardized β = .447) and preschool-aged (standardized β = .229) internalizing, which further supports the stability of internalizing behaviors over the preschool-to-school age transition.

To test for the possible role of social context (i.e., home vs. school environments) differences, the three models were tested separately with teacher-reported internalizing outcomes at late school age. In the Time 1 → Time 3 Prediction Model (Figure 7), Time 1 predictors alone explained 4.2% of the variance in teachers' reports of children's internalizing behaviors at Time 3. In the Time 2 → Time 3 Prediction Model (Figure 8), Time 2 predictors alone explained 10.5% of the variance in teachers' reports of children's internalizing behaviors at Time 3. In the Time 1 and Time 2 → Time 3 Prediction Model (Figure 9), Time 1 and Time 2 predictors together explained 11.0% of the variance in teachers' reports of children's internalizing behaviors at Time 3. Therefore, similar to results with the mother-reported outcomes, the model with Time 1 and Time 2 predictors combined explained the greatest variance in teachers' reports of internalizing behaviors at late school age. However, the overall explained variance was much lower for teacher-reported outcomes ($R^2 = .11$), compared with mother-reported outcomes ($R^2 = .40$). These findings suggest that there may be some meaningful differences in predictive models based on the child's functioning in home vs. school environments.

Multiple-group analyses. In order to test the sixth hypothesis that gender differences would exist in the above relationships (i.e., gender as a moderator), multiple-

group analyses were conducted with AMOS. The purpose of multiple-group analysis is to determine whether certain aspects of a structural equation model differs across groups, and if so, how. To examine the full proposed structural model (Figure 5) using multiple-group analysis, an unconstrained model (i.e., all path coefficients could vary) was compared with a completely constrained model (i.e., all path coefficients were set to be equal). Differences in chi-square values and degrees of freedom between the models were then compared using the chi-square difference test. Significant differences would mean that constraining the path coefficients worsened the model fit, thus suggesting that differences across groups do exist (Byrne, 2004). Results of multiple-group analyses on the full proposed structural model did not reveal a significant difference between the two models (Table 10; $\Delta\chi^2 = 15.681$, $\Delta df = 20$, $p > .05$); thus, differences between boys and girls in the full structural model were not supported. Although the models for boys and girls did not significantly differ, Table 10 reveals notable findings regarding the fit for the full, constrained model. Specifically, the lower and upper bounds of the 90% confidence intervals for RMSEA are both less than .05. According to Kline (2010), in this scenario the "close-fit hypothesis" is not rejected *and* the "poor-fit hypothesis" is rejected; this indicates strong support for an excellent model fit. The chi-square, as expected, was larger when the parameters were constrained to be equal. However, the increase in degrees of freedom associated with the fully constrained model resulted in better values for all supplementary model fit indices (i.e., CFI, RMSEA, AIC). Additional fit indices for both models are found in Table 10, and a full comparison of regression weights (standardized weights, with unstandardized weights in parentheses) from the unconstrained models are presented in Table 11.

Multiple-group analyses were also conducted for the three Time 3 prediction models (Figures 6, 7, and 8). No significant differences between the constrained and unconstrained models were found for the Time 1 → Time 3 Prediction Model ($\Delta\chi^2 = 4.479$, $\Delta df = 5$, $p > .05$), the Time 2 → Time 3 Prediction Model ($\Delta\chi^2 = 7.396$, $\Delta df = 6$, $p > .05$), or the Time 1 and Time 2 → Time 3 Prediction Model ($\Delta\chi^2 = 7.396$, $\Delta df = 6$, $p > .05$). Thus, for all three prediction models, differences between boys and girls were not supported. Additional fit indices for the models are found in Table 11.

CHAPTER IV

CONCLUSION

The present study was designed to examine children's emotion dysregulation processes in early childhood, negative parenting behaviors, and their concurrent and longitudinal relations with internalizing behavior problems. First, I sought to clarify whether different measures of children's emotion overregulation behaviors during kindergarten differentially related to internalizing problems. Next, structural equation modeling was used to examine complex links between negative parenting behaviors, emotion overregulation, and kindergarten internalizing behaviors both within and across time and home vs. school contexts. Then, I explored the predictive ability of preschool and kindergarten variables on late school-age outcomes. Finally, I examined whether child gender played a moderating role in the above relationships. In this chapter, I will discuss my findings in relation to existing theoretical and empirical issues and their implications. I also will discuss strengths and limitations of my study, and suggestions for future research.

Operationalization of Emotion Overregulation.

The first research question was partially exploratory, as research regarding operational definitions of emotion overregulation has been limited. The sparse research on emotion overregulation may be related to the current lack of agreement among researchers over even the most general definition of emotion regulation (Izard, 2010;

Cole, Martin, & Dennis, 2004). Still, many studies have shown that emotion

dysregulation (i.e., impaired emotion regulation abilities) is linked with negative

adjustment across development (Mennin, Heimberg, Turk, & Fresco, 2005; Cole, Michel,

& Teti, 1994). Behaviors indicative of emotion dysregulation likely follow a curvilinear

pattern, with emotion underregulation and overregulation on opposite sides of the

spectrum (Gross, 1998). Most prior literature, however, has focused on negative

outcomes of underregulation (Mullin & Hinshaw, 2007). Therefore, an important

research objective was to clarify the construct of emotion overregulation, and to elucidate

its specific links with behavioral outcomes.

      A striking gap in the current studies of emotion regulation relates to methodology:

most have employed a single-method technique to measure the construct. In many

previous studies, youth self-reports have been used as sole measures of emotion

regulation, but children below age six are usually unable to accurately predict their own

emotions (Zeman, Klimes-Dougan, Cassano, & Adrian, 2007; Reynolds, 1990). Possible

alternatives include measuring ER behaviors directly in children (e.g., Disappointment

Task; Saarni, 1984) and secondary reports of ER from parents and teachers. While

secondary reports provide observational information, signs of overregulated affect tend to

be covert and therefore, underreported by adults (Cole, Michel, & Teti, 1994). In

addition, behaviors often vary across contexts, which can be difficult to capture with a

single-informant questionnaire (Zeman & Garber, 1996; Zeman et al., 1997). In an

attempt to comprehensively and accurately measure the construct of emotion

overregulation in young children, the present study uniquely combines both direct

observational laboratory-based behavioral measures and multi-informant secondary reports of ER-related temperament and behavior.

Based on the limited existing literature on emotion overregulation techniques such as suppression and masking (e.g., Campos et al., 1994, Cole, Michel, & Teti, 1994a), I used children's affective responses to a mildly stressful laboratory task to create behavioral measures of overregulation. Because ER also has a relational component (Campos et al., 1994), my behavioral measures notably took social context (child with experimenter vs. alone) into account. The first variable I created was suppression, which was operationally defined as showing no negative emotions in response to disappointment in both social and alone contexts. The second variable, masking, was defined as showing positive affect and no negative affect (in response to disappointment) in the social context, but showing negative affect in the alone context. The final emotion overregulation variable combined the suppression and masking variables to create the most robust measure. Although a joyful affect (i.e., masking) variable was ultimately selected as the final emotion overregulation variable, preliminary regression analyses revealed significant links between the overregulation behavioral variable and concurrent internalizing outcomes.

Using information from the preliminary analyses, a structural equation model for emotion dysregulation variables was constructed and analyzed to examine my first research question. The model, which incorporated multi-contextual, multi-method, and multi-informant measures of emotion dysregulation across two time periods, tested whether preschool and kindergarten measures were differentially related to kindergarten internalizing problems. Analyses revealed a moderate model fit, with emotion

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dysregulation predictors accounting for over a quarter of the variance in internalizing outcomes. Results also partially supported my hypothesis that both temperament-based and situational measures of overregulated affect would be significantly linked with internalizing problems.

These findings provided several unique and important contributions to the literature. In previous studies, there has been a preponderance of single-method, single-context techniques for measuring emotion dysregulation. The great majority of extant studies have focused on adults with mature verbal and cognitive abilities (e.g., Ehring et al., 2010; Butler & Gross, 2004). In contrast, my results demonstrated the complexity of the emotion overregulation construct and the importance of creating operational variables that reflect its multi-faceted nature. Therefore, the operationalization of emotion overregulation in the present study represented one of the first attempts to examine this complex construct in young children. The present study also represented one of the first research efforts to clarify longitudinal relationships associated with emotion overregulation behaviors during the significant preschool-to-school age transition period. Interestingly, results revealed that children who used joyful affect to mask negative emotions tended to manifest relatively high levels of concurrent and longitudinal internalizing behavior problems. Therefore, early masking, rather than expression, of negative emotions in early childhood was linked to negative outcomes in our sample. This finding is particularly important to explore further, given the extremely limited body of literature on the short- and long-term effects of child emotion overregulation.

Another important contribution of my findings is its clarification of the limited theoretical literature regarding the curvilinear nature of emotion dysregulation behaviors.

While negative outcomes associated with underregulation have been already established in extant literature, the current study provides unique contributions regarding negative outcomes with overregulation. These findings provide support that healthy, adaptive ER likely falls between the two extremes of dysregulation, with under- and overregulation located on either end. Still, more research is needed to examine the limits of these healthy vs. impaired boundaries, in order to refine methods of assessing emotion dysregulation.

My findings also extended the current literature by identifying and clarifying specific emotion overregulation strategies. The study's index of children's masking of emotions involved substituting joyful affective expressions for negative ones; specific links were found between masking and internalizing behavior problems. Still, in future research, examining additional measures of masking may be useful for further clarifying these complex relationships. For example, because my behavioral measure of masking was a laboratory-based task, more naturalistic observations and reports of children's ER in natural settings (e.g., home, school) may be useful. Suppression of one's emotions is another emotion overregulation strategy that was examined in the present study. Including diverse measures of suppression behaviors in future models would provide an even more comprehensive operational definition of emotion overregulation. For example, with late school-age children, including self-report measures of their *intentions* for expressing or suppressing emotions may help to identify and confirm the use of these emotion dysregulation behaviors.

A methodological limitation related to the general construct of emotion overregulation involves the lack of child self-report study measures. In the present study, behavioral indicators of emotion regulation were solely used as indicators of emotional

suppression and masking. However, there is a possibility that a lack of emotional

expression in response to disappointment actually indicated a lack of *experienced*

emotion for some children. Without additional information to confirm these behaviors,

such as child self-report of experienced emotion, it may be difficult to assess the

difference between suppression and lack of experienced emotion. Similarly, in the

present study, expressions of joyful affect in response to disappointment were used as

indicators of masking behavior. However, there is a possibility that some children

actually experienced joyful affect; that is, they did not use joy to substitute (i.e., "mask")

their experienced negative emotions. Therefore, future inclusion of children's self-reports

of their emotional experience may help to strengthen the measures of emotion

overregulation.

Negative Parenting Behaviors, Emotion Dysregulation, and Internalizing: Direct and

Indirect Relationships.

The second research question concerned relationships between negative parenting

behaviors, child emotion dysregulation, and the development of internalizing problems.

Negative parenting and emotion dysregulation have both been directly linked with

internalizing problems (e.g., Keenan et al., 2009; Hipwell et al., 2008). However,

findings have been mixed, and research specific to the early childhood period is very

limited. For example, some have linked overregulation with later internalizing

psychopathology, whereas others have found links with externalizing outcomes (e.g.,

Keenan & Hipwell, 2005; Eisenberg et al., 2000; Cole et al., 1994b). In addition, the vast

majority of studies have involved only adult and adolescent populations (e.g., Ehring et

al., 2010; Campbell-Sills et al., 2006; Gross & Levenson, 1997). Negative (i.e., harsh,

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punitive) parenting practices have been linked with later depressive and anxious symptoms in children (e.g., Garber & Flynn, 2001; Hipwell et al., 2008), but further elucidation regarding specific pathways and mechanisms is needed.

One possible pathway relating negative parenting practices with later child internalizing problems is an indirect one, in which emotion dysregulation serves as mediator in the relationship. In general, parenting has been found to directly contribute to the early development of children's emotion regulation abilities (Gottman, Katz, & Hooven, 1996). Negative parenting behaviors, particularly use of punishment or minimization, have been found to be longitudinally linked with children's emotion dysregulation (Shipman et al., 2007; Eisenberg, Fabes, & Murphy, 1996; Gottman, Katz, & Hooven, 1996), which in turn has been linked with internalizing behaviors. Therefore, parenting variables were hypothesized to predict internalizing behaviors *through* emotion dysregulation.

Using structural equation analyses, my findings revealed a moderate model fit with several significant direct relationships. Child emotion dysregulation variables continued to be significant direct contributors in this model (i.e., joyful affect, shyness, and secondary reports of dysregulation, with internalizing outcomes), as the ER and full models were nested. Additional parenting variables were tested, and negative parenting behaviors in preschool were found to significantly predict internalizing problems in kindergarten. Based on the promising model fit, my final provided a reasonable depiction of the complex relationships between parenting, emotion regulation, and internalizing variables across the preschool-to-school age period. It illustrated several interesting patterns of early risk for children's development of depression- and anxiety-

related behaviors. These findings have important clinical and research utility: specific longitudinal mechanisms in children's development of internalizing problems, especially involving emotion overregulation predictors, have been ill-defined thus far.

Because the negative affective behaviors (in response to disappointment) variables at both ages were not significantly linked with internalizing behaviors, a modification was made to exclude the variable from the full proposed model. However, structural equation modeling analyses on the resulting modified model revealed that the exclusion did not significantly improve model fit or variable relationships. Therefore, the original, full proposed model was retained for later analyses.

One limitation of the full proposed structural model was the exclusion of the overregulation predictor variable created in earlier analyses. Preliminary analyses had revealed a significant relationship between the variable and concurrent preschool-age internalizing outcomes. As discussed above, however, due to its small sample size and dichotomous nature, it was ultimately excluded to increase model parsimony. This variable was replaced with the joyful affect variable as an index of masking. Still, preliminary findings provided some empirical support for the initial emotion overregulation variable as a measure of dysregulation, suggesting that future exploration of the variable would be worthwhile.

Contrary to our hypotheses, the mediation relationship (between negative parenting, emotion dysregulation, and internalizing) was not shown to be fully significant in the model. The lack of a significant indirect relationship was somewhat surprising, considering the range of literature on the role of parenting behaviors on the development of children's emotion regulation abilities (e.g., Gottman, Katz, & Hooven, 1996). One

possible explanation involves our index of emotion dysregulation. Perhaps, parenting

affects emotion regulation (ER) development in more subtle ways that cannot be directly

measured using laboratory behavioral measures in young children. It is possible that

using other study measures of emotion dysregulation, such as secondary reports of ER

behavior, may result in different results; literature has suggested that ER is contextually-

linked, so behaviors in one context may not be manifested the same way in another (Cole,

Michel, & Teti, 1994a). Relatedly, another possible explanation for the present findings is

the young age range of children in the study sample. That is, it is unclear in the literature

at what ages negative parenting behaviors begin to be linked with children's behavioral

displays of emotion dysregulation, specifically overregulation. It is possible that at later

ages, harsh and punitive parenting may be more significantly linked with children's

emotion overregulation behaviors. Lastly, while harsh parenting practices have been

associated with emotion overregulation behaviors (e.g., Eisenberg, Cumberland, &

Spinrad, 1998), other types of negative parenting behaviors have also been linked with

children's ER. For example, minimization of children's negative emotions has been

associated with long-term overregulation problems in children (Krause, Mendelson, &

Lynch, 2003). Also, over-involved or overly controlling parenting practices (e.g.,

extreme rule-setting, excessive protectiveness) have been linked with children's

internalizing symptoms (Hannesdottir & Ollendick, 2007; Garber & Flynn, 2001). Thus,

using a different index of negative parenting may strengthen the proposed mediation

relationship.

Another possible method for clarifying the association between parenting

behaviors and children's internalizing problems would be to examine specific subscales

of the broadband internalizing problems index of the CBCL (Achenbach, 1992; Achenbach & Rescorla, 2001) and Teacher Report Form (TRF; Achenbach, 1997; Achenbach & Rescorla, 2001). Recent studies have suggested that for young children, examining subscales of the internalizing domain separately may reveal greater gender and developmental variation (e.g., Carter, Godoy, Wagmiller, Veliz, Marakovitz, & Briggs-Gowan, 2010). Therefore, a more nuanced follow-up examination of the CBCL and TRF outcome variables may be helpful.

Negative Parenting Behaviors, Emotion Dysregulation, and Internalizing: Stability vs. Change over Time.

The third research question involved examining the temporal stability of negative parenting practices, children's emotion dysregulation, and children's internalizing over the preschool-to-kindergarten age transition. Existing research on children's temperament has shown that shyness is moderately stable across childhood, beginning from toddler ages (e.g., Sanson et al., 1996). Also, children's internalizing problems have been found to be moderately stable across development (e.g., Luby et al., 2009; Lavigne et al., 1998), and homotypic continuity may exist from ages 6-9 to ages 11-13 (Keenan et al., 2009). Findings regarding the stability of emotion dysregulation behaviors during childhood, however, have been very limited. Negative parenting practices may also show stability over time (Metzler, Biglan, Ary, & Li, 1998), although again, limited findings exist for earlier childhood ages. Therefore, given the relative paucity of research on the stability of children's emotion dysregulation behaviors and negative parenting practices over the preschool-to-kindergarten period, my examination of these variables was partially exploratory.

The results of my full SEM model analyses confirmed hypotheses that shyness in preschool would be significantly linked with shyness in kindergarten, and that internalizing behaviors in preschool would be linked with internalizing behaviors in kindergarten. These findings were consistent with previous studies as discussed above. Results showed that harsh and punitive parenting practices remained stable over the preschool-to-kindergarten period, posing additional research questions regarding how to modify this risk factor during the critical transition. On the other hand, children's affective responses to disappointment were not stable across time, suggesting that the coping styles change over this transitional period. This finding poses interesting follow-up questions regarding mechanisms of change over time. For example, given the increase in social interactions during kindergarten, it would be interesting to examine whether peer relationships influence children's ER strategies. Another possible explanation for the lack of stability in emotion dysregulation behaviors over the preschool-to-kindergarten period is related to cognitive developmental changes in children during that time. Some studies have suggested that around the kindergarten-age period, children develop greater cognitive self-awareness (e.g., Reynolds, 1990), and thus, possibly display a different pattern of emotion overregulation behaviors. Further research is necessary to determine whether the pattern involves an increase or decrease in use of these ER strategies over time.

Examining relationships within study variables from preschool to *late* school-age periods was beyond the scope of the present study. Therefore, bivariate correlations of variables between the three ages were examined. Significant correlations existed for stability in internalizing problems between preschool and kindergarten, and between

kindergarten and late school ages. This finding suggests that stability in children's

internalizing behaviors may exist across a 7-year developmental period, which is

consistent with current literature (e.g., Ashford et al., 2008). However, additional

analyses are needed to fully test the long-term stability of this variable.

Limitations to these findings also exist. A possible limitation may relate to the

confounding factor of same-informant stability. That is, our findings regarding the

stability of shyness, negative parenting, and internalizing behaviors may be partially

attributable to stability of maternal perceptions, rather than child behavior, over time

(Sanson et al, 1996). However, research has shown that maternal ratings are sensitive to

actual changes in children's behavior (e.g., Barkley, Fischer, Newby, & Breen, 1988).

Thus, although it is important to consider alternative explanations to stability of variables

over time, it seems more likely that our findings reflect valid measures of stability and

change in children's behavior.

The Role of Social Context

The fourth research question was whether the relationships tested above varied

between home and school contexts. Studies have shown that these differences between

multi-informant reports reflect true contextual differences in behaviors, and that multiple

reports typically are not interchangeable (Kerr, Lunkenheimer, & Olson, 2007; Grietens

et al., 2004; Achenbach & Rescorla, 2001; Hinshaw & Nigg, 1999). Consistent with prior

research (e.g., Salbach-Andrae, Lenz, & Lehmkuhl, 2009; Stanger & Lewis, 1993), our

preliminary analyses revealed low levels of agreement between mothers' and teachers'

reports of internalizing problems at all ages. Therefore, it was important to examine these

outcomes in separate models in order to gain the most comprehensive picture of children's developmental pathways.

To explore the question of whether context played a role in the manifestation of children's internalizing problems, I tested a second structural equation model with teachers', rather than mothers', reports of internalizing problems. Generally, small differences were found between the two models. Both had similar, moderate model fits, and both revealed similar significant pathways, although the mothers' model had more significant relationships (to internalizing outcomes) than the teachers' model. The model predictors also explained slightly more of the variance in the mother-reported outcomes than in the teacher-reported outcomes. I also tested each Time 3 prediction model using teacher-reported outcomes. Results revealed that the overall explained variance in late school-age internalizing was much lower (approx. 30%) for teacher-reported outcomes than mother-reported outcomes.

Therefore, exploratory findings partially supported our hypothesis that models would differ across home and school contexts. One possible explanation for this difference may be related to the relatively covert nature of internalizing symptoms (Cole, Michel, & Teti, 1994). In particular, research has shown that internalizing behaviors are under-detected by teachers, compared with more overt externalizing behaviors (Bradshaw, Buckley, & Ialongo, 2008; Achenbach, McConaughy, & Howell, 1987). Relatedly, due to their more covert nature, accurate detection of internalizing problems may depend more on children's verbal self-reports. However, young children have more limited cognitive self-awareness and thus have difficulty expressing their emotions (e.g., Reynolds, 1990). Therefore, given the relative differences in children's time spent

between home and school, teachers may have fewer opportunities to witness these verbal expressions. Another possible explanation may be related to differences in norms, between mothers and teachers, for defining internalizing behavior problems. Mothers and teachers may interpret certain behaviors differently, which may result in differing ratings in their reports of the child's functioning (e.g., see Grietens et al., 2004). True differences in children's behaviors between settings may also exist, as children can manifest differing levels of internalizing symptoms at school and home (e.g., Cantwell, Lewinsohn, Rohde, & Seeley, 1997). That is, teachers and mothers may provide different but equally valid information regarding children's behavior. Generally, these results contribute to the expanding literature that multi-contextual models of risk are crucial in fully examining children's developmental pathways.

Predictions to School-Age Internalizing Outcomes

The fifth research question highlighted predictive relationships across the three time points of the present study (preschool, kindergarten, and late school-age). Investigators have emphasized the importance of examining young children's social adjustment to their transitions to school, as it is associated with later outcomes (Masten & Coatsworth, 1995; Losoya et al., 1998). An important predictor of children's adjustment is their ability to manage and organize their emotions (Denham et al., 2003; Keenan, 2000), which is also associated with cognitive and academic abilities (Graziano et al., 2007; Denham, 2006). In addition, as children begin to approach late school ages and early adolescence, gender-linked patterns of internalizing behaviors begin to emerge (Cole et al., 2002; Hankin et al., 1998; Keenan & Hipwell, 2005). Thus, the school-age period is critical for elucidating possible precursors of these forthcoming changes.

Although literature generally supports the overall patterns discussed above, very limited research has examined specific developmental pathways to internalizing problems, across the preschool-to-school age transition. Therefore, the present study took an exploratory approach to examining the predictive relationships within our sample.

Although I was unable to include late school-age outcomes in our full SEM model due to limited late school-age predictors, three predictive models were created. Results revealed that the combination of preschool (T1) and kindergarten (T2) predictors explained the greatest percentage of variance in mother-reported school-age (T3) outcomes. Thus, my hypothesis that the combined predictive ability of preschool and kindergarten age variables would be strongest, due to accumulated effects across development, was supported. Examination of specific relationships revealed that negative parenting behaviors and early internalizing behaviors were significant predictors of children's internalizing problems at age 10 years. These results were consistent with studies that have revealed homotypic continuity in internalizing symptoms over time (e.g., Keenan et al., 2009). They also supported findings that harsh and punitive parenting practices are associated with later internalizing problems (e.g., Garber & Flynn, 2001; Hipwell et al., 2008). However, given the exploratory nature of these analyses, structural equation modeling of these relationships would be an important next step to confirm these relationships.

The Role of Child Gender

The sixth and final research question concerned the potential role of child gender as a moderator of relationships between negative parenting, emotion dysregulation, and internalizing behaviors. A robust body of literature has shown that by early adolescence,

gender differences in the prevalence of internalizing problems exist. For example, females show at least double the risk of developing depressive and anxiety disorders during the adolescence to adulthood age period, as compared with males (Essau, Lewinsohn, Seeley, & Sasagawa, 2010; Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). In addition, early internalizing symptoms in females have been associated with a chronic course of depression (Essau et al., 2010). Not only are girls more likely to develop depressive and anxious symptoms, but their symptoms also show greater continuity over time than for boys (Chaplin, Gillham, & Seligman, 2009).

Given the numerous findings regarding female risks during adolescence, it is clear that gender is an extremely important variable to consider when examining longitudinal relationships with internalizing outcomes. However, little is known about early precursors of depression and anxiety disorders, and findings during the school-age years have been mixed or inconclusive. There has been evidence for gender-linked differences in both parents' socialization behaviors (e.g., Eisenberg, Cumberland, & Spinrad, 1998), and in the prevalence of children's internalizing behavior problems (Cole et al., 2002; Keenan & Hipwell, 2005). Research has been limited, however, for examining gender differences in children's emotion regulation abilities. Even more limited attention has been given to exploring these relationships within the context of emotion overregulation. In addition, for each of these variables, little is known about specific early childhood ages during which gender differences begin to emerge (Archer & Lloyd, 2002). Examination of earlier developmental periods, as present in my study, would assist in clarifying these ages of emergence. Therefore, an important goal of the study was to examine whether developmental precursors of later risk exist, and to clarify these potential variables.

Gender differences in the full SEM model. I investigated the possible moderating

role of gender within the full proposed SEM model by conducting multiple-group

analyses. Surprisingly, my hypothesis that the relationships examined in our model would

differ by child gender was not supported. Although overall gender differences were not

found, comparison of the coefficients between boys' and girls' pathways for the full,

unconstrained SEM model revealed some interesting findings. In particular, the stability

of relationships from preschool to kindergarten internalizing behaviors was significant

and nearly identical for both boys and girls. These data suggest that internalizing

behaviors were equally stable for both groups across the preschool-to-kindergarten

transition. Moreover, there was no evidence for mean-level gender differences in child

internalizing problems. These findings support literature suggesting that gender

differences in internalizing behaviors may not occur until later childhood or early

adolescence (Zahn-Waxler et al., 2000; Hankin et al., 1998).

Further examination revealed that for girls only, shy temperament in kindergarten

significantly predicted kindergarten-age internalizing behavior problems. These results

converged with other studies that have linked shyness with internalizing problems in

young girls (e.g., Mathieson et al., 2009; Letcher et al., 2009). In addition, for children

with shy temperaments, parenting behaviors may be particularly important in their

development of emotion regulation abilities (Yagmurlu & Alton, 2010). For example,

Rothbart and Bates (2006) found that children with certain emotional temperaments may

elicit negative parenting behaviors, which can lead to internalizing; these parental

socialization practices have been shown to differ for boys and girls (e.g., Cunningham et

al., 2009). Therefore, there could also be an indirect relationship between temperament, parenting, and internalizing, with gender as a moderator.

Examination of pathway coefficients also suggested possible gender differences in associations between emotion overregulation and internalizing behaviors. For boys only, positive affect in response to disappointment (during both preschool and kindergarten) significantly predicted both preschool and kindergarten-aged internalizing problems. Therefore, behavioral measures of overregulation predicted internalizing, but only for boys. Because little is currently known about gender differences in affect overregulation, this finding was neither consistent nor inconsistent with our expectations. It was somewhat consistent with findings from a normative study sample, however, which revealed that adolescent boys used overregulation techniques (e.g., suppression) more often than girls (Gullone, Hughes, King, & Tonge, 2010). Given the lack of research on the topic, especially in early childhood, our preliminary exploratory finding may contribute to follow-up analyses in clarifying the under-examined construct of emotion overregulation.

Although unexpected, the relative paucity of gender differences among relationships tested in my full SEM model may be explained in several ways. First, it is possible that some gender differences did in fact exist, but that most of the pathways included in our full model did not adequately reflect these differences. This explanation was supported by the fact that some specific gender findings were revealed from the individual pathways, as discussed above. The preponderance of non-significant relationships, therefore, could have suppressed any significant findings; this would have led to an overall non-significant gender difference. Second, it is possible that significant

gender differences simply do not exist for the age periods tested in my full model. As discussed above, most literature regarding gender differences in internalizing problems have detected significant differences beginning in early adolescence (Essau, Conradt, & Petermann, 2000; Hankin et al., 1998).

Multiple-group analyses resulted in an additional interesting finding regarding the strong fit for the full, constrained model. In this model, all path coefficients for boys and girls were fixed (i.e., could not vary freely). Although the boys' and girls' models did not differ significantly, contrary to my hypothesis, examining the constrained model across the groups revealed a particularly excellent model fit. The excellent fit of the constrained model and specific differences between individual pathways warrant further analyses.

Gender differences in the Time 3 prediction models. Because late school-age outcomes were not included in the full structural equation model, they were examined separately. Multiple-group analyses were conducted to examine possible gender differences in predictive pathways to age 10 outcomes. My hypothesis that differences would exist between boys and girls was again unsupported. While gender differences had not been found for my model involving earlier ages, I had expected to find gender-differentiated results for the later school-age period. Specifically, because females' prevalence rates of internalizing symptoms more than doubles in the early adolescent period (Essau et al., 2010; Zahn-Waxler et al., 2000), I questioned whether precursors for this increase could be identified using the late school-age sample.

One explanation for the lack of gender differentiated predictive patterns may be the specific age range of the present sample. Prior studies have suggested that an increase in female internalizing symptoms can be detected by ages 12-14 (Essau et al., 2000;

Hankin et al., 1998). My prediction models examined internalizing problems in 10 year old children, with predictor variables from ages 3 and 6. Therefore, future analyses including variables during the adolescent period may yield more robust gender differences. Still, the present findings provided important longitudinal information for studying the elusive issue regarding the age of emergence for gender differences in internalizing behaviors. Because gender differences were not found by age 10, these results suggest that the age 10-12 period may be a critical juncture for investigating precursors, as the greatest changes are soon to emerge.

Another explanation for lack of gender differences among the predictive relationships is related to the particular set of predictors present in the models. It is possible that gender differences existed, but the model predictors did not adequately reflect these differences. For example, peer-related psychosocial stressors are increasingly salient in the late school-age to adolescence periods (Smith, Rose, & Schwartz-Mette, 2010), and may be related to emerging gender differences at that time. Also, non-behavioral, genetic influences may be important to consider. Although using biological variables were beyond the scope of the present study, it is possible that they might explain a notable amount of the differences in prevalence rates between genders (e.g., Kendler, Gatz, Gardner, & Pedersen, 2006). Therefore, continued, comprehensive examination of these gender relationships, perhaps using additional variables, will be important for future longitudinal investigations.

<u>Strengths and Limitations</u>

There were some limitations to the generalizability of these findings. First, the majority of children in the present study came from intact, middle class, two-parent

households and European American backgrounds. Although our sample's demographics were representative of the local population, they limit study generalizability for children of more diverse economic, family, and racial/ethnic backgrounds (e.g., low-income, single-parent, non-European American households). Existing literature suggests that socioeconomic and racial/ethnic factors can play important roles in the relationships examined in the present study. A study by McLoyd (1998) found that children may receive harsher, more inconsistent parenting when their families came from lower, rather than higher, socioeconomic backgrounds. Children from low SES families may also show greater difficulties with self-regulation and socio-emotional adjustment (Evans & English, 2002).

Literature also suggests that racial/ethnic variables should be considered when examining children's emotion regulation behaviors. For example, gender differences in regulating emotions in response to disappointment have not been consistently observed across cultures (Josephs, 1994). Learned emotion regulation strategies among children can also differ between cultures. In Chinese cultures, young children are commonly taught to suppress and mask inappropriate emotions (Ruihe & Guoliang, 2006). Similar findings have been reported by Garrett-Peters and Fox (2007), who found lower overall emotional expression in response to disappointment in Chinese-American children than in European-American children. Also, emotion overregulation may not be linked to negative mental health outcomes in non-U.S. cultures (Butler, Lee, & Gross, 2007). Therefore, further research on developmental processes among ethnic minorities and children of varying socioeconomic backgrounds would help to determine generalizability of the present findings across various socio-ecological contexts.

Second, children in the present study sample represented an at-risk population. Specifically, we oversampled children within the medium-high to high range of the Externalizing Problems subscale in mother's reports on the CBCL. However, these findings may not be generalizable to clinically-referred child populations, who by definition show very high levels of problem behaviors..

There were also several methodological limitations to the present study. First, although we took a multi-level and multi-contextual approach to measuring emotion overregulation, we did not include a children's self-report measure of their emotion regulation behaviors. Studies suggest that children below the age of six are not yet sufficiently cognitively self-aware to report on their own ER behaviors (e.g., Reynolds, 1990). However, inclusion of children's self-perceptions of emotion regulation at later ages may provide useful information about the development of children's emotion regulation (e.g., see Keenan et al., 2009).

Second, when operationalizing the under-examined construct of emotion overregulation (i.e., suppression and masking), we had created a composite behavioral variable drawn from children's responses to a stressful task. Preliminary findings revealed a significant link between this unique variable and internalizing behavior problems, but it was excluded from the SEM model due to its small sample size and binary nature. Instead, we used emotional expression variables to measure suppression and masking behaviors, which resulted in some interesting findings. Still, because the original composite variable may be a more theoretically comprehensive measure of emotion overregulation, it warrants further examination in follow-up analyses.

Third, our measures of negative parenting behaviors (i.e., harsh punishment and lack of warmth) were based on maternal self-report. One reason for including mother-only reports was related to sample size; the number of father reports available in the present data set was relatively low and would have limited our sample size. Still, including father reports of parenting behaviors, as well as observational (rather than self-report) measures of parenting in future studies may decrease the likelihood of reporter bias and provide a more complex picture of parenting. Relatedly, additional teacher reports of emotion dysregulation behaviors existed for late school-age periods; however, due to the lack of other relevant late school-age predictors, it was not included in the current model.

Finally, there were limitations regarding sample size and statistical power. The sample size of the present study (i.e. $n > 200$) was acceptable, but within the lower limit of suitability for structural equation modeling analyses. According to Kline (2010), a sample size of 200 is within typical range for SEM if the model is relatively simple. Therefore, the present study examined the most parsimonious model possible. Our N:q ratio, the ratio between the number of cases and number of estimated parameters, was approximately 40:200 (or 5:1), which was again just above the lower limit of suitability for SEM (Kline 2010). However, the present study did not reach the conventional power level of 0.8 (MacCallum, Browne, & Sugawara, 1996); as a result, proposed models can more likely to be accepted than rejected. Therefore, our resulting model fits should be interpreted with this limitation in mind.

Statistical Analyses. In addition, there were several statistical limitations to the present study. First, we used stepwise regressions in our preliminary analyses to help

determine the emotion overregulation variables to include in our final SEM model. Therefore, the variable determination was partially data-driven, as the regression results revealed which variables may be related to my outcomes. One potential problem with using this technique is that the study results may not replicate as well as if variables had been fully chosen *a priori* (McNemar, 1969). Again, our SEM model results should be interpreted with this limitation in mind.

Second, although we found evidence of a few outliers within our dataset, after some follow-up analyses (i.e., bootstrapping) we retained them in our analyses for purposes of preserving our sample size. Although not highly likely, it is possible that inclusion of these outliers may have affected the results of our analyses. It may be useful to examine the individual outliers in greater detail, to determine whether any particular patterns (e.g., similar/different characteristics) exist among these participants. For example, person-centered analyses of children who show very high levels of emotion overregulation behaviors could provide interesting information regarding group differences in their developmental patterns (Laursen & Hoff, 2006).

Third, the full SEM model examined in the present study involved only two time points: preschool (T1) and kindergarten (T2), with complete data available for prediction of kindergarten-age internalizing outcomes only. The reason for this limitation was due to the limited number of relevant cross-time variables for the later school-age years. Analyzing longitudinal data with only two time points made it more difficult to develop longitudinal structural equation models with our full dataset.

Conclusion

The present study extends the current body of literature in several ways. First, while emotion underregulation in children has been widely studied, the construct of emotion overregulation and its associated outcomes is poorly understood. Further, operational definitions of emotion overregulation are limited and unclear. In the current study, a social contextually-based, behavioral index of emotion overregulation was proposed for further study. In addition, we presented a multi-method, multi-contextual examination of the construct in our structural equation modeling analyses, which revealed interesting significant links to childhood internalizing problems. Specifically, results showed that both overregulation behaviors (i.e., positive affect in response to disappointment) and overregulation-related temperaments (i.e., shyness) were early risks for kindergarten-aged internalizing behaviors. These findings supported a curvilinear, continuous conceptual model for emotion dysregulation, and provided unique empirical support for overregulation as a possible risk factor for internalizing disorders.

In addition, relatively few studies have examined transactional relationships between parenting practices, emotion dysregulation, and internalizing problems over time (e.g., Feng et al., 2009), and even fewer have focused on the preschool-to-school age transition. The present study revealed several interesting findings regarding this under-studied developmental transition period. In particular, negative parenting behaviors and multiple types of emotion dysregulation measures (i.e., direct behavioral, temperament, and secondary report of behavior) predicted kindergarten-aged internalizing problems. Also, predictors from both preschool and kindergarten were found to account for a significant percentage of the variance in late school-age internalizing outcome, suggesting that early risks accumulate across development. Results of the predictive

models also supported literature regarding the moderate stability of internalizing symptoms in early childhood (e.g., Keenan et al., 2009). This finding has important implications, as early internalizing problems have been linked with even more severe outcomes over time (e.g., Keenan et al., 2009; Luby et al., 2009; Lavigne et al., 1998). In addition, both the SEM and prediction model results suggested that some differences may exist in predictive relationships according to home vs. school contexts, highlighting the importance of more nuanced and comprehensive future examinations of children's behavior.

Finally, the present study contributes to our understanding of the role of gender in relationships between children's emotion dysregulation, negative parenting behaviors, and internalizing behavior problems, as few investigators have simultaneously assessed these complex risk factors in early childhood. Our finding that gender did not moderate these relationships suggested that the emergence of gender differences, particularly in internalizing symptoms, may take place during a later developmental period. This finding narrows down the age range for investigating the emergence of gender differences, which provides important guidance for future analyses. Therefore, continued research on specific early precursors of child internalizing problems, including the moderating role of gender, is essential for a clearer, more integrative understanding of developmental processes. The present study underscores the great value of identifying early emotion dysregulation and parenting-related risk factors in elucidating developmental links between behavior and psychopathology. These findings also have important implications for informing avenues for early prevention of negative long-term outcomes in children.

TABLES

Table 1. Bivariate correlations among Disappointment Task predictors and mother- and teacher reported internalizing behavior outcomes

Variable	1	2	3	4	5	6	7
1. Overreg T1	---						
2. Joy-total T1	-.045	---					
3. Joy-diff T1	.020	-.40**	---				
4. Overreg T2	-.14	.003	- .098	---			
5. Joy-total T2	.009	-.038	-.027	.17*	---		
6. Joy-diff T2	-.052	.048	-.062	-.15*	-.64**	---	
7. Int Mom T1	-.048	.043	.047	-.024	.029	0	---
8. Int Teach T1	.18*	-.073	.12	-.14	-.046	-.022	.11
9. Int Mom T2	-.023	.14	-.052	-.014	.13	-.011	.36**
10 Int Teach T2	-.081	-.071	.061	-.037	-.11	.11	.019

*Note: Overreg = Overregulation variable (Suppression and Masking); diff = difference between social and alone contexts in Disappointment Task. int = internalizing behaviors
*p < .05, **p < .01

Table 1 (Continued)

Variable	8	9	10
8. Int Teach T1	---		
9. Int Mom T2	-.005	---	
10 Int Teach T2	.14	.35**	---

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

Table 2. Means and Standard Deviations: Demographic Variables

Variable	M		SD		Range		
	Boys	Girls	Boys	Girls	Boys	Girls	*p*
Child age at T1 (months)	37.84	37.46	2.59	2.85	32.53-44.83	26.60-43.77	n.s.
(boys n=122, girls n=113)							
Child age at T2 (months)	69.71	67.79	3.67	3.81	50.43-76.20	60.90-80.50	n.s.
(boys n=112, girls n=87)							
Child age at T3 (years)	10.50	10.33	.56	.69	8.52-11.78	8.72-11.65	n.s.
(boys n=99, girls n=88)							
Family SES	55.05	53.79	10.59	11.10	22-66	22-66	n.s.
(boys n=121, girls n=112)							
Child IQ*	10.04	10.42	4.32	4.59	2-22.5	2.5-22.5	n.s.
(boys n=120, girls n=106)							

*Note: Child IQ represents the average score of Vocabulary and Block Design subtests on the WPPSI-R.

Table 3. Means and Standard Deviations: Emotion Regulation and Parenting Variables

Variable	M		SD		Range		
	Boys	Girls	Boys	Girls	Boys	Girls	p
Joy behav a/f disappointmt-T1	5.03	4.67	10.82	8.18	0-77.5	0-36.91	n.s.
(boys n=104, girls n=92)							
Neg emot behav a/f disapp-T1	7.66	6.46	11.25	10.18	0-44.45	0-39.73	n.s.
(boys n=104, girls n=92)							
Joy behav a/f disappointmt-T2	7.14	8.93	15.63	13.99	0-100	0-62.5	n.s.
(boys n=97, girls n=80)							
Neg emot behav a/f disapp-T2	13.34	12.40	13.62	13.02	0-53.57	0-55.21	n.s.
(boys n=97, girls n=80)							
Shyness temperamt (mom)-T1	3.44	3.60	1.22	1.23	1-6.62	1-6.77	n.s.
(boys n=120, girls n=112)							
Shyness temperamt (mom)-T2	3.28	3.34	1.26	1.20	1-6.46	1-6.00	n.s.
(boys n=112, girls n=96)							
Emotion dysreg (teacher)-T2	0.15	-0.16	0.88	0.79	-1.15-3.5	-1.1-3.1	< .05
(boys n=100, girls n=92)							
Neg parenting composite-T1	0.10	-0.12	0.85	0.69	-.99-3.19	-1.1-2.2	< .05
(boys n=118, girls n=110)							
Neg parenting composite-T2	0.082	-0.13	0.90	0.78	-1.19-3.3	-1.2-2.7	< .07
(boys n=116, girls n=102)							

*Note: Significance (p) values refer to t-test results.

Table 4. Means and Standard Deviations: Child Internalizing Reported by Mothers and Teachers

Variable	*M*		*SD*		Range		
	Boys	Girls	Boys	Girls	Boys	Girls	*p*
3-year Internalizing							
Mother (boys n=118, girls n=108)	6.48	6.71	4.81	4.80	0-27	0-23	n.s.
Teacher (boys n=97, girls n=91)	6.04	5.51	6.68	6.82	0-39	0-38	n.s.
6-year Internalizing							
Mother (boys n=113, girls n=102)	3.42	4.09	3.59	4.45	0-18	0-24	n.s.
Teacher (boys n=99, girls n=91)	2.51	2.48	3.41	4.22	0-16	0-29	n.s.
10-year Internalizing							
Mother (boys n=105, girls n=92)	5.70	5.67	5.86	5.92	0-29	0-29	n.s.
Teacher (boys n=101, girls n=93)	5.27	4.08	6.93	5.18	0-30	0-27	n.s.

*Note: Significance (*p*) values refer to t-test results.

Table 5. Bivariate Correlations among Emotion Regulation Variables

Variable	1	2	3	4	5	6	7
1 Joy behav a/f disapptmt –T1	---	-.203**	-.038	-.107	.009	-.034	-.001
2 Neg emot behav a/f disapp –T1		---	-.103	.077	.101	.039	.003
3 Joy behav a/f disapptmt –T2			---	-.182*	-.200**	-.072	-.078
4 Neg emot behav a/f disapp -T2				---	.083	.004	-.082
5 Shyness temperamt (mom) -T1					---	.647**	-.142
6 Shyness temperamt (mom) -T2						---	-.058
7 Emotion dysreg (teacher) -T2							---

*$p < .05$, **$p < .01$

Table 6. Bivariate Correlations among Children's Internalizing Behavior Problems

Variable	1	2	3	4	5	6
1. T1 – mom	---	.113	.359**	.019	.335**	.086
2. T1 – teacher		---	-.005	.140	.018	.005
3. T2 – mom			---	.348**	.575**	.162*
4. T2 – teacher				---	.126	.211**
5. T3 – mom					---	.334**
6. T3 – teacher						---

*Note: T1 = Preschool Internalizing; T2 = Kindergarten Internalizing; T3 = School-age Internalizing, mom = Mother-report; teacher = Teacher-report
*$p < .05$, **$p < .01$

Table 7. Bivariate Correlations: All Study Variables (Top half for girls, bottom half for boys)

Variable	1	2	3	4	5	6	7	8
1. Joy behav T1	---	-.111	-.04	.054	-.100	-.174	.110	-.244*
2. Neg emot T1	-.265**	---	.128	.118	.046	-.045	.180	.121
3. Joy behav T2	-.034	-.082	---	-.161	-.196	-.042	-.075	.050
4. Neg emot T2	-.207	.055	-.195	---	.096	-.074	-.201	.101
5. Shyness T1	.083	.148	-.210*	.076	---	.605**	-.091	.031
6. Shyness T2	.046	.097	-.095	.064	.683**	---	.075	.011
7. E dysreg T2	-.075	-.144	-.055	-.011	-.17	-.16	---	.203
8. Neg Parent 1	-.060	.069	-.126	.054	.004	.006	.229*	---
9. Neg Parent 2	.149	.018	-.051	.122	.072	.072	.163	.549**
10 Int Mom T1	.114	.032	-.011	.083	.357**	.292**	.16	.288**
11 Int Teach T1	-.045	.038	-.034	-.098	.255*	.219*	.205	-.119
12 Int Mom T2	.197	.123	.244*	.029	.105	.163	.278**	.065
13 Int Teach T2	-.127	.017	-.102	-.042	-.056	-.042	.396**	.033
14 Int Mom T3	-.030	.139	.108	-.028	.039	.127	.224*	.082
15 Int Teach T3	-.019	.095	.052	.106	-.158	-.126	.233*	.233*

*Note: Joy behav = Joy behaviors after disappointment; Neg emot = Negative emotion behaviors after disappointment; E dysreg = Emotion dysregulation, teacher report; Neg parent = Negative parenting behaviors composite; Int Mom = Mother's report of internalizing behaviors; Int Teach = Teacher's report of internalizing behaviors
*$p < .05$, **$p < .01$

Table 7 (Continued)

Var	9	10	11	12	13	14	15
1.	-.114	-.063	-.123	.079	.021	.047	.102
2.	.065	-.044	.008	.004	.108	-.033	.078
3.	.088	.071	-.066	.013	-.121	-.123	-.075
4.	.141	.292**	-.056	.108	-.035	.215	.043
5.	.039	.371**	.172	.175	.032	.202	.029
6.	.073	.188	.172	.361**	.285**	.329**	.048
7.	.149	-.010	.142	.144	.437**	.226*	.286*
8.	.562**	.129	.297**	-.061	.262*	-.183	-.052
9.	---	.086	-.078	.152	.404**	.062	.106
10.	.210*	---	.107	.320**	-.006	.340**	-.128
11.	-.064*	.12	---	-.065	.165	0	.031
12.	.145	.418**	.071	---	.430**	.623**	.109
13.	-.055	.053	.118	.219*	---	.179	.047
14.	.118	.330**	.035	.535**	.063	---	.347**
15.	.149	.277**	-.014	.245*	.042**	.350**	---

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

Table 8: Structural Equation Modeling results: ER structural model (Fig. 4) and Full structural model (Fig. 5)

Model	χ^2	*df*	*p*	χ^2/df	CFI	AIC	RMSEA (CI)
ER structural model (Figure 4)	42.03	19	<.01	2.20	.890	112.03	.070 (.042 – .099)
Full **structural** model (Figure 5) - Mother int	53.76	25	<.01	2.15	.908	157.76	.069 (.043 – .094)
Full **structural** model (Figure 5) - Teacher int	51.77	25	<.01	2.07	.895	155.77	.066 (.030 – .092)
Full **modified** model (Figure 6) - Mother int	32.97	15	<.01	2.20	.939	110.97	.070 (.037 – .103)
Full **modifed** model (Figure 6) - Teacher int	37.29	15	<.01	2.49	.910	115.29	.078 (.047 – .110)

*Note: int = internalizing behaviors; CI: 90% Confidence interval for RMSEA.

Table 9. Structural Equation Modeling results for Full structural model (Fig. 5): Mother vs. Teacher Reports

Pathway	Mother reports (β)	Teacher reports (β)
1. Neg Parenting 1 → Neg Parenting 2	.561 (.609)**	.563 (.610)**
2. Joy behaviors 1 → Joy behaviors 2	-.040 (-.063)	-.041 (-.063)
3. Neg emot behavior 1 → Neg emot behavior 2	.069 (.086)	.079 (.098)
4. Shyness 1 → Shyness 2	.639 (.640)**	.636 (.635)**
5. Internalizing 1 → Internalizing 2	.318 (.266)**	.069 (.039)
6. Neg Parenting 1 → Joy behaviors 2	-.097 (-3.68)	-.090 (-3.40)
7. Neg Parenting 1 → Neg emot behavior 2	-.005 (-.166)	-.003 (-.091)
8. Neg Parenting 1 → Internalizing 2	-.188 (-.962)*	-.064 (-.312)
9. Joy behaviors 1 → Internalizing 2	.136 (.028)*	-.083 (-.016)
10. Neg emot behavior 1 → Internalizing 2	.095 (.018)	.033 (.006)
11. Shyness 1 → Internalizing 2	-.127 (-.414)	-.067 (-.208)
12. Neg Parenting 2 → Internalizing 2	.119 (.564)	.142 (.634)
13. Neg Parenting 2 → Joy behaviors 2	.047 (1.64)	.045 (1.56)
14. Neg Parenting 2 → Neg emot behaviors 2	.118 (3.65)	.116 (3.62)
15. Neg Parenting 2 → Shyness 2	.045 (.066)	.043 (.062)
16. Neg Parenting 2 → Emotion dysreg (teacher)	.18 (.179)*	.178 (.177)*
17. Joy behaviors 2 → Internalizing 2	.147 (.02)*	-.117 (-.015)
18. Neg emot behaviors 2 → Internalizing 2	.048 (.009)	-.048 (-.007)
19. Shyness 2 → Internalizing 2	.29 (.949)**	.142 (.441)
20. Emotion dysreg (teacher) → Internalizing 2	.198 (.939)**	.370 (1.66)**

*Note: Standardized regression weights shown; unstandardized weights in parentheses. 1 = Time 1; 2 = Time 2
*$p < .05$, **$p < .01$

Table 10: Multiple-group analyses for Gender: Full structural model (Fig. 5)

Model	χ^2	df	p	$\Delta\chi^2$	Δdf	p	CFI	AIC	RMSEA (CI)
Full model with no constraints	81.94	50	<.01	--	--	--	.892	289.94	.052 (.03 – .071)
Full model with all constraints	97.62	70	<.05	15.68	20	*n.s.*	.907	265.62	.041 (.018 – .049)

*Note: CI: 90% Confidence interval for RMSEA.

Table 11: Multiple-group analyses for Gender: Time 3 prediction models (Figures 7, 8, & 9)

Model	χ^2	df	p	$\Delta\chi^2$	Δdf	p	RMSEA (CI)
T1 → T3 prediction model with all constraints	0	0	n/a	--	--	--	.074 (.055 − .094)
T1 → T3 prediction model with no constraints	4.48	5	*n.s.*	4.48	5	*n.s.*	0 (0 − .085)
T2 → T3 prediction model with no constraints	0	0	n/a	--	--	--	.074 (.055 − .094)
T2 → T3 prediction model with no constraints	7.40	6	*n.s.*	7.40	6	*n.s.*	.031 (0 − .094)
T1 & T2 → T3 prediction model with no constraints	0	0	n/a	--	--	--	.074 (.055 − .094)
T1 & T2 → T3 prediction model with no constraints	10.72	11	*n.s.*	10.72	11	*n.s.*	0 (0 − .067)

*Note: CI: 90% Confidence interval for RMSEA.

Table 12. Multiple-group analysis on full structural model with NO constraints: Results for Boys vs. Girls

Pathway	Boys (β)	Girls (β)
1. Neg Parenting 1 → Neg Parenting 2	.551 (.584)**	.560 (.628)**
2. Joy behaviors 1 →Joy behaviors 2	-.035 (-.051)	-.026 (-.044)
3. Neg emot behavior 1 →Neg emot behavior 2	.049 (.059)	.100 (.128)
4. Shyness 1 →Shyness 2	.676 (.694)**	.596 (.581)**
5. Internalizing 1 →Internalizing 2	.335 (.251)**	.317 (.295)**
6. Neg Parenting 1 →Joy behaviors 2	-.135 (-4.98)	.000 (-.002)
7. Neg Parenting 1 → Neg emot behavior 2	-.014 (-.443)	.018 (.679)
8. Neg Parenting 1 → Internalizing 2	-.132 (-.555)	-.189 (-1.22)
9. Joy behaviors 1 → Internalizing 2	.236 (.039)**	.122 (.033)
10. Neg emot behavior 1 → Internalizing 2	.208 (.033)*	.047 (.010)
11. Shyness 1 → Internalizing 2	-.073 (-.214)	-.208 (-.755)
12. Neg Parenting 2 → Internalizing 2	.059 (.237)	.142 (1.10)
13. Neg Parenting 2 → Joy behaviors 2	.034 (1.17)	.071 (2.55)
14. Neg Parenting 2 → Neg emot behaviors 2	.109 (3.29)	.116 (3.92)
15. Neg Parenting 2 → Shyness 2	.023 (.032)	.074 (.115)
16. Neg Parenting 2 → Emotion dysreg (teacher)	.109 (.176)	.147 (.149)
17. Joy behaviors 2 → Internalizing 2	.289 (.033)**	-.031 (-.005)
18. Neg emot behaviors 2 → Internalizing 2	.102 (.013)	.025 (.004)
19. Shyness 2 → Internalizing 2	.135 (.386)	.442 (.164)**
20. Emotion dysreg (teacher) → Internalizing 2	.290 (1.18)	.098 (.554)

*Note: Standardized regression weights shown; unstandardized weights in parentheses. 1 = Time 1; 2 = Time 2
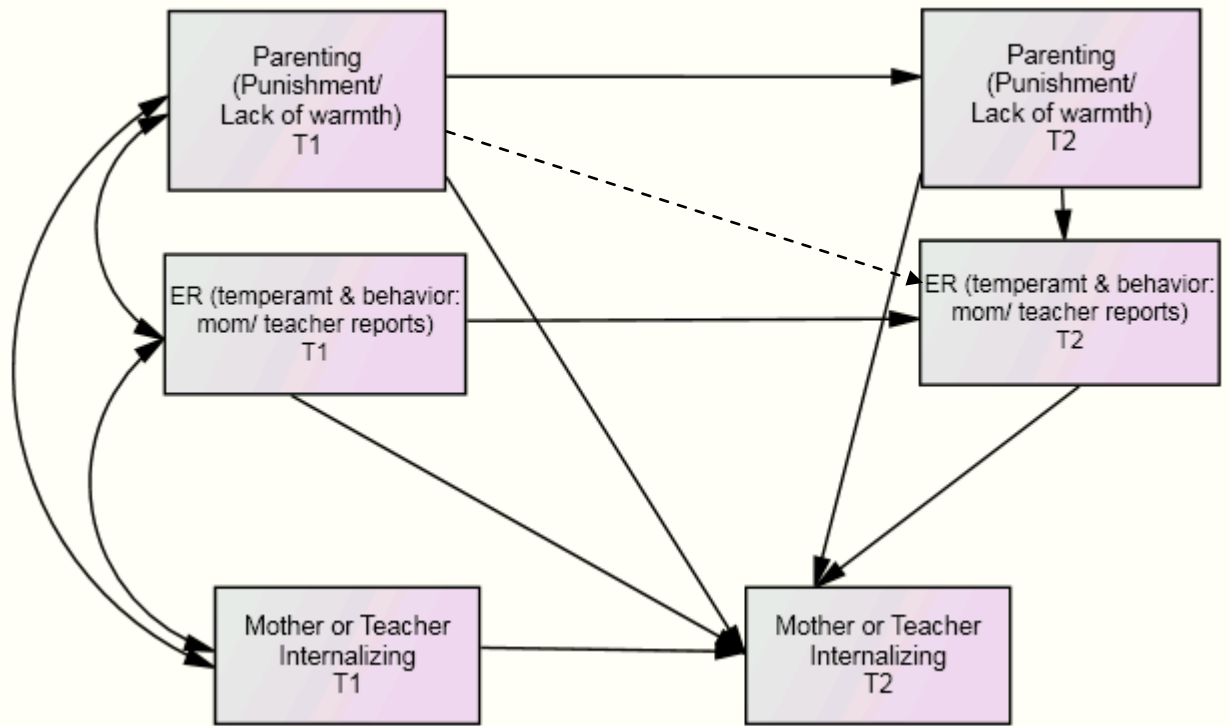*$p < .05$, **$p < .01$

FIGURES

Figure 1. Conceptual ER path model for structural equation modeling analyses.
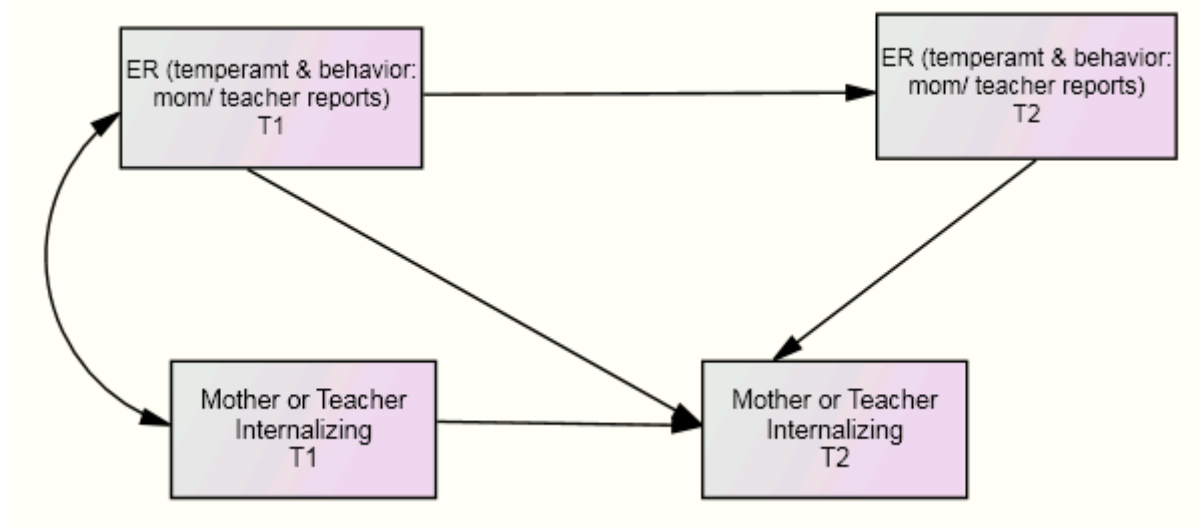
*Note. The above figure represents two separate models: 1) mother-reported outcomes, and 2) teacher-reported outcomes.

Figure 2. Conceptual full path model for structural equation modeling analyses.

*Note. Hypothesized *direct* effects are depicted with **bold** lines; hypothesized *indirect* effects are depicted with **dashed** lines.

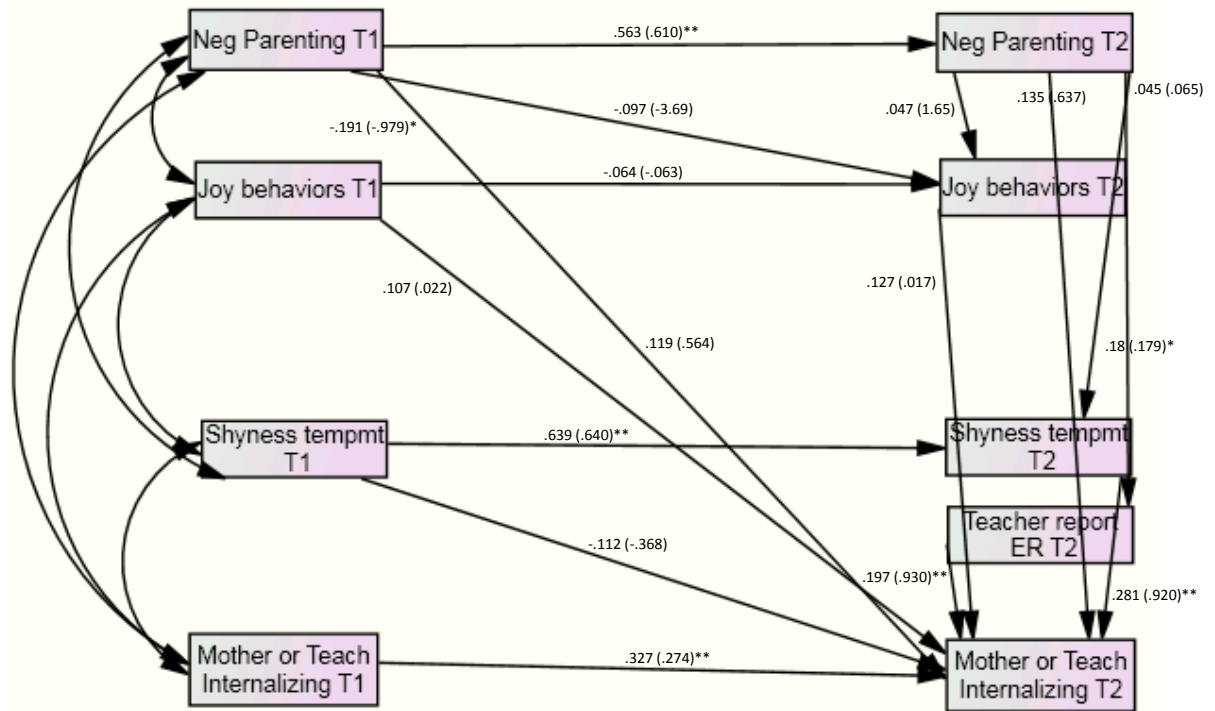Figure 3. Conceptual Time 3 prediction models for structural equation modeling
analyses.
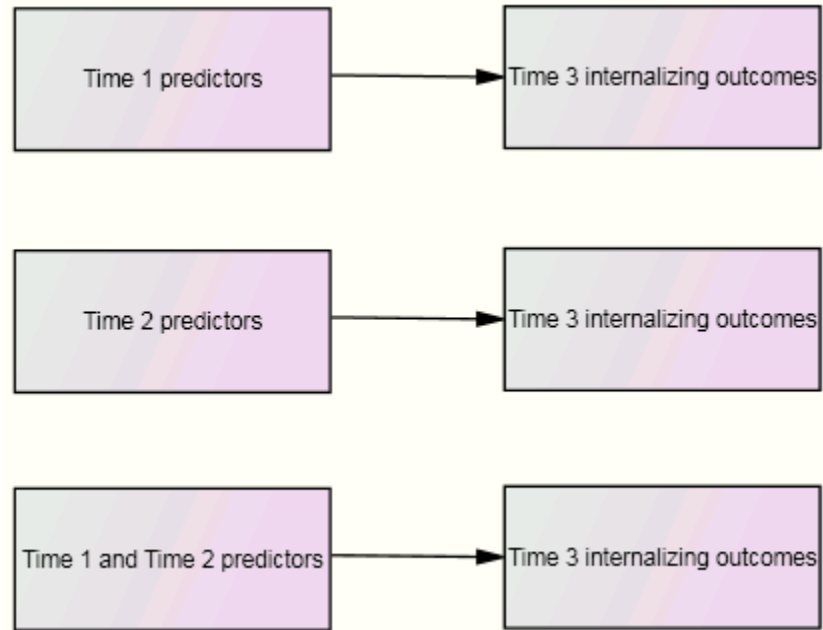
Figure 4. ER structural model for structural equation modeling analyses.
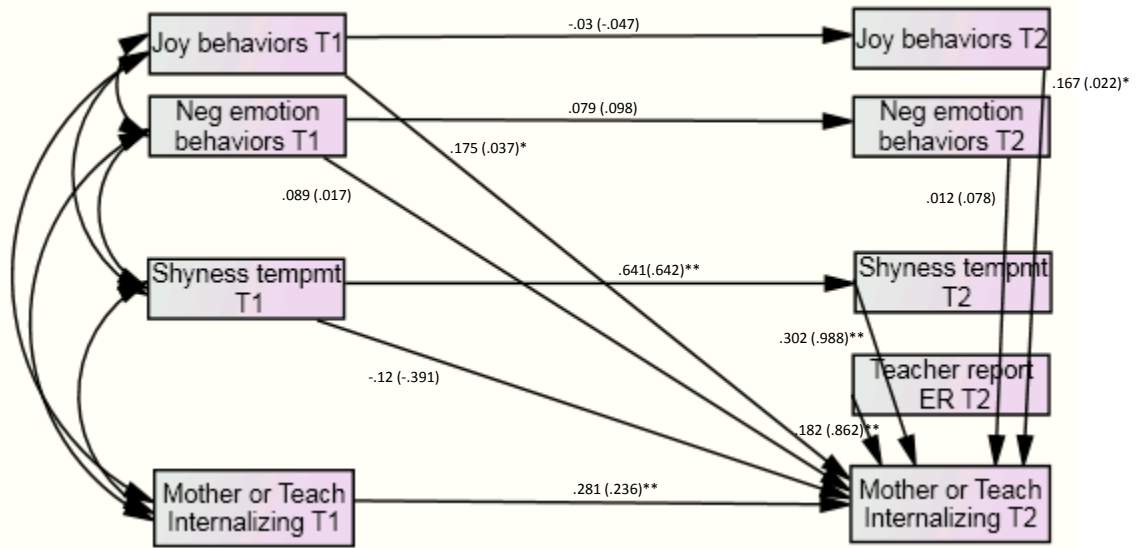
*Note: Conceptual model is shown in Figure 1. Standardized regression weights for mothers' reports of internalizing shown, with unstandardized regression weights in parentheses. $R^2 = .257$, for Mother Internalizing T2. Teacher-reported model results are not shown.
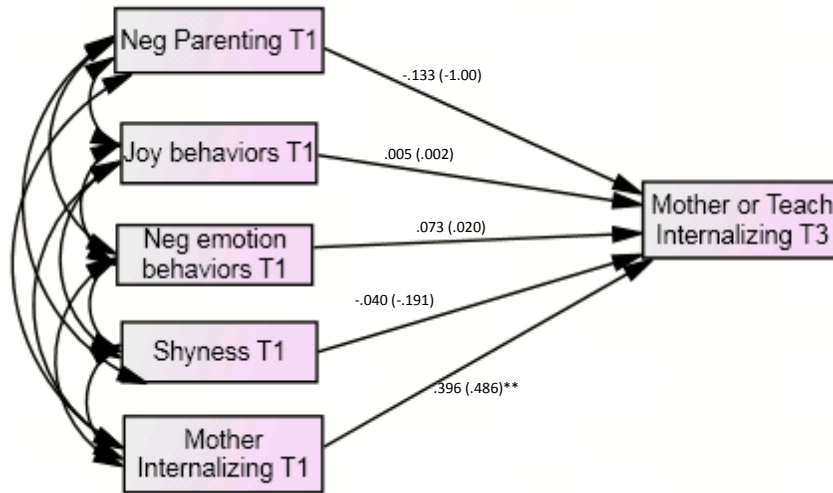*$p < .05$, **$p < .01$

Figure 5. Full structural model for structural equation modeling analyses.
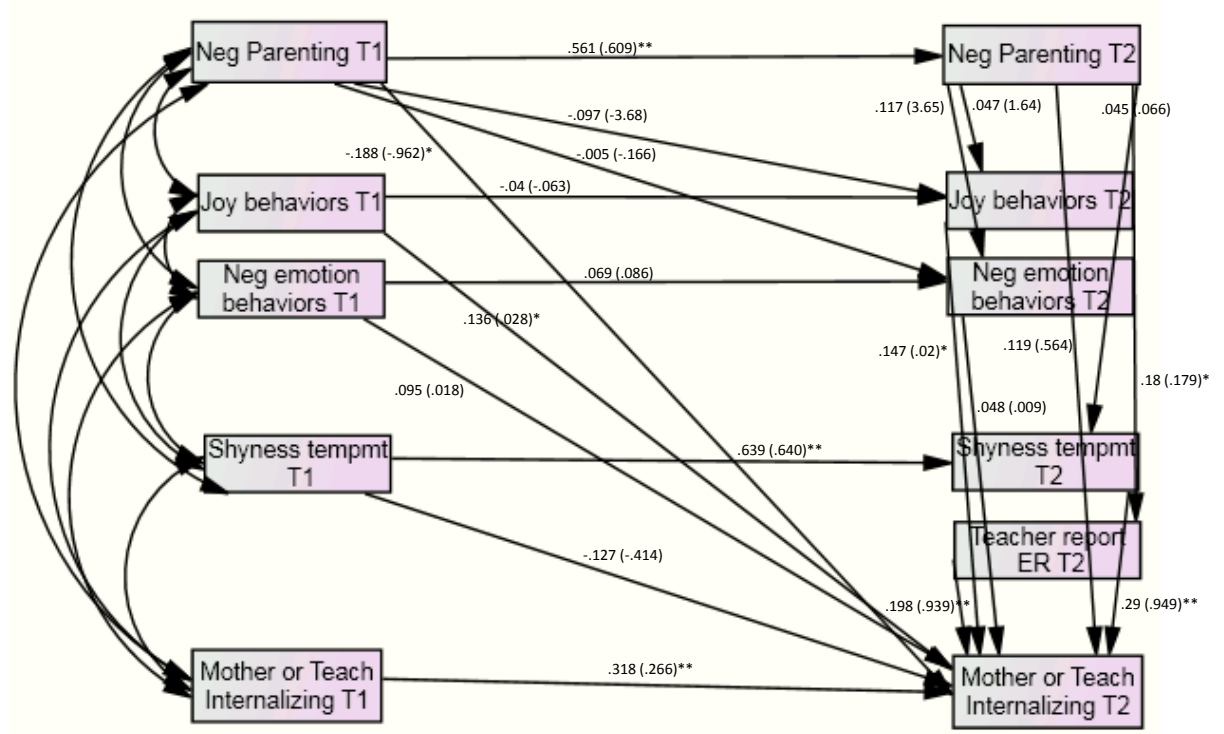
*Note: Conceptual model is shown in Figure 2. Standardized regression weights for mothers'
reports of internalizing shown, with unstandardized regression weights in parentheses. $R^2 = .276$,
for Mother Internalizing T2. Teacher-reported model results are not shown.
*$p < .05$, **$p < .01$

Figure 6. Full modified model for structural equation modeling analyses.

*Note: Standardized regression weights for mothers' reports of internalizing shown, with unstandardized regression weights in parentheses. $R^2 = .262$, for Mother Internalizing T2. Teacher-reported model results are not shown.
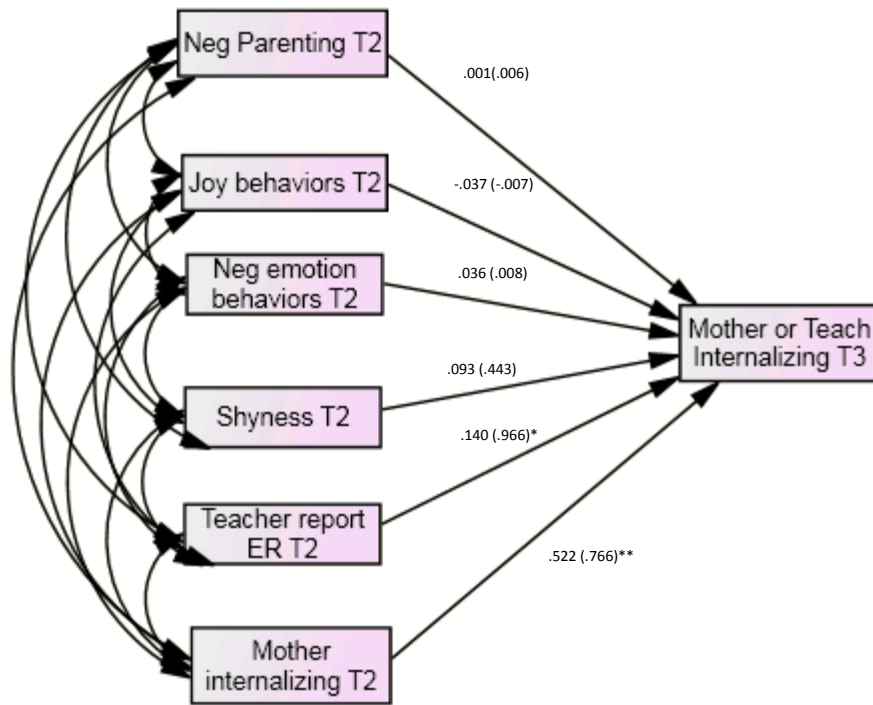*$p < .05$, **$p < .01$

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Figure 7. Time 1 → Time 3 prediction model for structural equation modeling analyses.

*Note: Conceptual model is shown in Figure 3. Standardized regression weights for mothers' reports of internalizing shown, with unstandardized regression weights in parentheses. R^2 = .145, for Mother Internalizing T3. Teacher-reported model results are not shown.
*$p < .05$, **$p < .01$

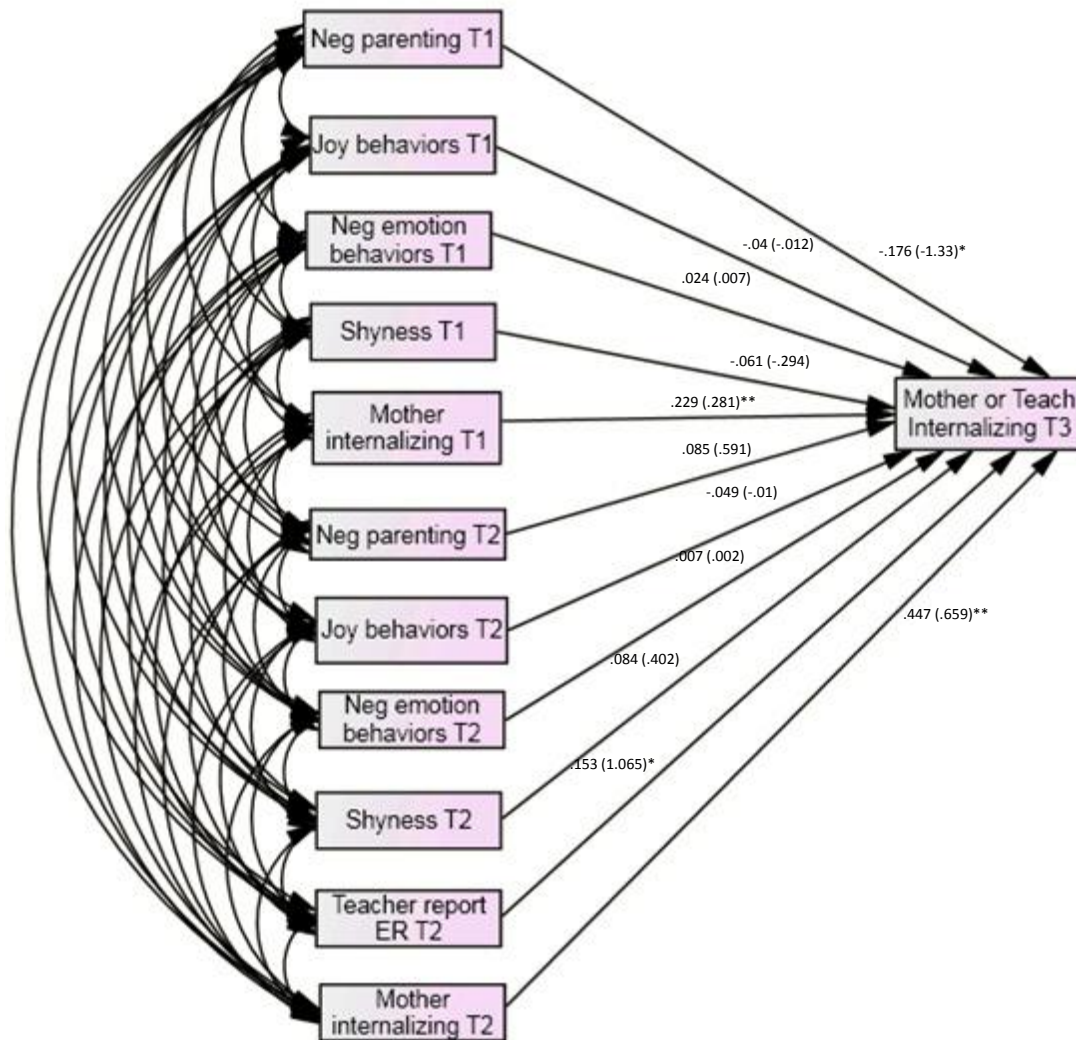Figure 8. Time 2 → Time 3 prediction model for structural equation modeling analyses.

*Note: Conceptual model is shown in Figure 3. Standardized regression weights for mothers' reports of internalizing shown, with unstandardized regression weights in parentheses. $R^2 = .353$, for Mother Internalizing T3. Teacher-reported model results are not shown.
*$p < .05$, **$p < .01$

Figure 9. Time 1 & Time 2 → Time 3 prediction model for structural equation modeling analyses

*Note: Conceptual model is shown in Figure 3. Standardized regression weights for mothers' reports of internalizing shown, with unstandardized regression weights in parentheses. $R^2 = .400$, for Mother Internalizing T3. Teacher-reported model results are not shown.
*$p < .05$, **$p < .01$

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