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Trajectories Of Emotion Regulation Into Middle Childhood: An Investigation Of Attachment, Temperament, And Language

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**TRAJECTORIES OF EMOTION REGULATION INTO MIDDLE CHILDHOOD: AN
INVESTIGATION OF ATTACHMENT, TEMPERAMENT, AND LANGUAGE**

by

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DISSERTATION

Submitted to the Graduate School

of Wayne State University,

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Approved by:

Advisor

Date

DEDICATION

To my husband. Thank you for providing unconditional support and love.

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CHAPTER 1 INTRODUCTION

In 2000, a National Academy of Science report deemed self-regulation the “cornerstone of early childhood development that cuts across all domains of behavior” (Shonkoff & Phillips, 2000, p. 3). Emotional regulation involves the reactivity and control of emotion and the ability to regulate one’s physiological and psychological states (Eisenberg, Hofer, & Vaughan, 2007). It has been found to have a fundamental role in multiple areas of development and functioning (Eisenberg, et al., 2007). For example, several studies have found that children who have difficulty managing emotions may be less successful in negotiating peer relationships and dealing with academic challenges (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003; Keane & Calkins, 2004). Emotion regulation functioning and its development has been delineated in several theoretical models, (e.g., Gross, 2007; Westen & Blagov, 2007) and has been shown to be associated with several developmental constructs such as attachment, temperament, and language. However, studies have yet to integrate early relationship and child-centered factors, from infancy through middle childhood, in an attempt to look at emotional regulation development over time. The current study aims to extend understanding of how child-centered factors such as temperament and language skill affect emotion regulation in middle childhood within the context of early attachment relationships.

The Typical Development of Emotion Regulation

Emotion regulation is organized and stable in adulthood not due solely to biological factors, but to multifaceted developmental influences (Thompson & Meyer, 2007). Emotion regulation may be viewed not only as an adaptive, reactive

component in emotional experience, but also functional in that it entails diminishing, heightening, or maintaining both positive and negative affect in an attempt to attain a goal in a particular situation (Cicchetti, Ganiban, and Barnett, 1991; Thompson & Meyer, 2007). In addition to 'turning the dial up or down' on emotion regulation skills also involve monitoring and evaluating emotions, as well as modifying them (Thompson & Meyer, 2007). Thus, these processes include both a control (efforts to manage reaction) and reactive (biological propensity to physiological reaction) dimension that interact in a dynamic fashion across time and development within the child's social and environmental context (Calkins & Hill, 2007; Calkins & Johnson, 1998; Fox & Calkins, 2003).

The control dimension of emotion regulation includes efforts on the child's part to manage the expression and experience of emotion, thus managing the impact on themselves, and interaction with others and the environment. This process is thought to move from a mostly external orientation to a mostly internal orientation throughout childhood (Calkins, 1994; Sroufe, 1996). During infancy, a child relies on their caregiver to regulate most of their emotional events (Sroufe, 1996). Through development, however, the child begins to enact self-employed strategies to manage emotion (Sroufe, 1996). While discussing self-regulation, Kopp (1982) noted that typically, early external sources of emotional control (the caregiver) likely form the origins of internal control (child initiated) of emotion.

An internal orientation of emotion regulation, and thus self-employed regulation strategies, necessarily develop within the context of the many leaps and bounds a child takes both physically and cognitively. For example, for most children,

the period between 3 and 6 months marks biological-regulatory development as sleep-wake cycles, eating, and waste elimination processes become more predictable (Calkins & Hill, 2007). At the same time, the infant develops increasing control of attention mechanisms and simple motor skills (Harman, Rothbart, & Posner, 1997; Rothbart et al., 1992). Early emotion regulation skills come in to play at this point, as infants have been shown to engage in self-initiated distraction and disengagement of attention in response to an aversive stimuli (Kochanska, Coy, & Murray, 2001).

Kopp (1982) discusses how a typically developing child's newfound mobility and cognitive development during and around the latter half of the first year parallels a newfound ability to control and affect one's environment. These motor gains open new avenues for controlling emotional experiences and expression. Additionally, around this same time, a dramatic shift in cognitive processing occurs as the child moves from a sensorimotor type of functioning to adaptive responsiveness (Werner, 1957), problem solving (Piaget, 1952), and hypothesis testing (Kagan, 1971, 1972). In fact, Tompson (1990) found striking changes in emotion regulation during this period. Children were assessed at 6, 9, and 12 months of age on negative and positive emotional reaction as well as latency in response to four sets of stimuli situations (peek-a-boo and puppet play with the mother, a stranger approach encounter, and a brief separation from the mother). Data indicated that with increasing age, infants responded quicker and with greater intensity and persistence to emotion elicitors. These findings are in line with Kopp

(1982) who stated that by the end of the first year of life, infants become more active and purposeful in attempt to control affective arousal (Kopp, 1982).

By the second year of life, emotion regulation increasingly shifts from passive emotion regulation (external, care-giver oriented) to active emotion regulation (internal, child-initiated) (Rothbart et al., 1992). Children of this age normally employ new strategies, such as seeking out parent intervention in a purposeful manner. Some theorists and researchers stress that the development of language skill during this time is instrumental in emotion regulation (Thompson, 1994). In toddlerhood, the child begins to understand and respond to the care-giver's directives and, consequently, compliance and self-control emerge (Kopp, 1982). In addition to language, by the end of toddlerhood, children have executive control abilities that allow for the control of arousal and the regulation of emotional reactivity across contexts (Rueda, Posner, & Rothbart, 2004). As children age emotion regulation continues to develop within the context of the care-giver relationship and child centered factors, such as temperament and language skill.

Through early and middle childhood the combination of increased internal and external knowledge of emotion also enables development of emotion regulation in that the child learns to predict their own and others' emotional reactions and enact regulation accordingly (Stegge & Terwogt, 2007). Children develop increased knowledge of others' emotions, including an understanding of how beliefs and desires effect emotion. This understanding, often called 'theory-of-mind reasoning' may occur, to some degree, as early as 15 months old (Onishi & Ballargeon, 2005) and likely continues to develop throughout early childhood, as children by the age of

6 are able to accurately predict false belief-based emotions correctly (Harris, Johnson, Hutton, Andrews & Cooke, 1989).

As children move through middle childhood they develop emotional awareness, or the ability to recognize and reflect on their own emotion experiences, which is integral in the development of emotion regulation. Some research supports that introspective skills continue to improve through the late elementary school years (Selman, 1981). Harris, Olthof, and Meerum Terwogt (1981) interviewed seventy-two 6-, 11-, and 15-year olds and found that a marked shift in the child's concept of emotion occurs between 6- and 11- years old. Younger children tended to refer to external events to inform emotional awareness ('I know I am happy because it is my birthday.') while older children tended to refer to internal events ('I know that I am happy because I *feel* happy.') They concluded that 11- year olds demonstrated emotional awareness, while 6- year olds did not. Casey (1993) also found evidence of this cognitive-affective shift while studying childrens' emotion and understanding reports during a game that included positive or negative feedback. Stronger relations between emotion expression and understanding among 12-year olds were found, compared to those of 7-year olds, which may have reflected the older childrens' greater capacity for self-awareness. It is around this same time in middle childhood, ages 7 to 10, that children grasp complex social emotions, those emotions that result from the discrepancy between a child's actual behavior and how s/he thinks they ought to behave (Ferguson & Stegge, 1995). These cognitive-affective shifts represent an increasing ability to recognize and regulate internal and external emotion cues as children grow older.

The development of emotion regulation from external regulation to internal processes is informed by self- and other- emotional awareness and is a dynamic process that has demonstrated stability. As discussed above, as the child grows, emotion regulation strategies change and become more sophisticated. Further support has been found regarding brain maturation and patterns of neurological functioning related to emotional processes, as they appear to continue to develop throughout adolescence (Giedd, 2004) with animal studies showing development into adulthood (e.g., Cunningham, Bhattacharya, & Benes, 2002). While change continues to occur through time, studies also show that emotion regulation may develop into a stable 'style' of regulation at an early age. For example, Kochanska et al. (2001) assessed 108 children at age 14, 22, 33, and 45 months of age and found significant stability of internalization and fearfulness over time in response to two different distressing tasks. Data on emotion regulation through childhood reflects developmental continuity, in that change occurs over time but within the context of individuals' stable emotion regulation style.

Several factors have garnered significant support as contributing to the development of emotion regulation, including attachment relationships measured in infancy, temperament, and language skill. Higher levels of cumulative risks in early and middle childhood have repeatedly been found to be directly predictive of children's lower levels of competent emotional self-regulation (Evans & English, 2002; Lengua, 2002; Raver, 2004). It is thus imperative to understand how compounded risks affect the development of emotion regulation through childhood. Emotion regulation has a ubiquitous impact in children's futures, as findings suggest

that emotional self-regulation may play a key mediating role in models of poverty, ecological risk, and children's development of behavioral problems (Aber et al., 2000; Maughan & Cicchetti, 2002).

It is notable that ethnicity, as well as indices of socioeconomic standing, are included in most studies of emotion regulation. This is, in part, because findings continue to be inconsistent with respect to emotion regulation differences among ethnic and socioeconomic groups. Some studies have found that ethnicity and socioeconomic standing indicators, such as parental education and level of family resources, are associated with children's emotion regulation outcomes (Dilworth-Anderson, Burton, & Johnson, 1993; McLoyd, Cauce, Takeuchi, & Wilson, 2000). However, ethnicity and economic standing are often confounded in measurement due to minority status' association with social standing (Bean, Bush, McKenry, & Wilson, 2003). Some support exists for the notion that economic standing and support are primary contributors of parenting style and child outcome, over and above ethnic differences (Fine, McKenry, Voydanoff, & Donnelly, 1992; Hill & Bush, 2001; McKenry & Fine, 1993). For instance, among mothers experiencing low-income circumstances, and reportedly high levels of stress with low levels of support, Middlemiss (2003) identified similar parenting styles among African American and Caucasian mothers of children 3-5 years of age. Bean et al. (2003) state that because of the greater proportion of single-parent households and lower levels of parental education among African Americans, when compared to Caucasians, it is important to control for these demographic factors when examining associations between parenting and youth outcome between these groups.

Attachment

The role of the child-caregiver relationship is vital to consider when investigating emotion regulation development, as it is within the context of this relationship that the use of particular strategies may be learned for the successful modulation of emotional arousal (Calkins & Hill, 2007). During infancy, the child's emotion regulation is highly dependant on the care-giver, as the child is almost completely reliant on the parent or caregiver (Calkins & Fox, 2002; Kopp, 1982; Sroufe, 2000). Successful emotion regulation is predicated on the caregiver's consistency and flexibility in responding (Calkins & Fox, 2002; Kopp 1982; Sroufe 2000). In addition to direct interventions to relieve negative states such as distress and fear (Lamb & Malkin, 1986), parents also affect emotion regulation through modeling coping strategies and selective reinforcement of positive emotions (Malatesta-Magan, 1991), induction of emotion through social referencing and empathy (e.g., Stern, 1985, Thomposn, 1987; Walden, 1991), and verbal instruction about emotion and regulatory strategies (Dunn & Brown, 1991; Miller & Sperry; 1987).

The bond that develops between the infant and the caregiver has been termed 'attachment' and several studies have shown that it is associated with the development of emotion regulation. Theory and research regarding the development of this relationship is rooted in the work of John Bowlby (1969) who emphasized the evolutionarily adaptive nature of infant attention eliciting and proximity seeking behaviors such as visual referencing, clinging, and crying. Such behaviors are thought to serve to regulate biological needs and ensure the safety of

the infant, thus increasing the likelihood of survival. Bowlby (1988) states that the history of events where stress or threat occurs to the infant, and the caregiver responds in a regulatory fashion, accumulates and consolidates into a representation of the care giver by the end of the first year.

Sroufe (1996, 2000) explicates that the development of self-regulation occurs within the context of these affective interactions between infant and caregiver, and that the expectations and strategies learned from this history form the 'internal working model' (Bowlby, 1973). This internal working model is a cognitive framework that defines strategies and coping mechanisms used in the pursuit of meaningful goals (Collins & Read, 1994; Hazan & Shaver, 1994) and transfers from the immediate caregiving environment to the larger social world of peers and others (Sroufe, 1996, 2000). Thus, the affective regulation history experienced with the caregiver at an early age is internalized and helps to guide the later self-initiated, internally oriented emotion regulation.

Confirming the existence of individual differences and patterns in caregiver-infant relationships, Ainsworth developed an empirical paradigm that tests effects of the relationship history which has subsequently become the gold standard assessment of attachment (Ainsworth, Blehar, Waters, & Wall, 1978). In the 'Strange Situation' a series of brief, increasingly stressful episodes activate the infant's attachment system resulting in behavior that is coded for 'attachment style'. Infants are characterized as exhibiting secure, insecure-avoidant, insecure-resistant, or disorganized attachment.

The classification of attachment style is based on behavioral observations of the child during the strange situation. Secure attachment style is evidenced by infants' exploration, positive affect sharing during a low-stress context, and proximity seeking and ability to be comforted during a high-stress context. Insecure attachment is characterized by either heightened distress and difficulty calming, or an active avoidance of the caregiver during high-stress contexts and is split into two groups, avoidant and reactive, based on patterns of responding. Avoidant infants generally act indifferently toward the caregiver while resistant infants are overly focused on the caregiver (Ainsworth, Blehar, Waters, & Wall, 1978).

A fourth category, disorganized attachment style, was later identified by Main and Solomon (1990) and describes those children with no coherent coping strategy in dealing with the increasingly stressful events constituting the strange situation. Disorganization is most obvious during the reunion episodes with odd behaviors that may appear contradictory, conflicted, or fearful. For example, Hesse (1999) described several common behaviors coded as disorganized; the infant may cling while crying hard and simultaneously leaning away with an averted gaze, freeze with a trancelike expression with hands raised in the air, hit the parent's face or eyes while in an apparently good mood, or rise at the parent's entrance and then fall on the floor. Main and Hesse (1990) argue that the common theme among all disorganized behavior is "contradiction or inhibition of action as it is being undertaken (p. 173)."

Attachment and emotion regulation. Some researchers have focused on the adaptive functionality of the different attachment styles infants display. It is

argued that attachment styles are strategies that the infant employs in an attempt to get basic attachment needs met within the context of their caregiver's responsive style (Calkins & Hill, 2007; Cassidy, 1994). These strategies result in characteristic emotional responding patterns that likely influence the child's emotion regulation through out childhood and, perhaps, into adulthood.

Studies converge to indicate that infants whose mothers respond sensitively to their cues are more likely to be securely attached (Ainsworth et al., 1978; Belsky, Rovine, & Taylor, 1984; Egeland & Farber, 1984). These infants use the mother as a secure base from which to explore when there is no threat, and as a haven when danger arises (Ainsworth et al., 1978; Main & Solomon, 1986). Studies have also shown that infants with secure attachment relationships display the widest range of emotions when compared to other attachment groups and use effective strategies for emotion modulation and regulation such as social referencing, and expressing a need for intervention (Braungart & Stifter, 1991; Cassidy, 1994; Nachmias et al., 1996). Children whose emotion regulation develops within this attachment context likely show open and flexible emotional responding without systematic distortions (Cassidy, 1994). Within the rubric of several emotion theories, development of this sort of emotion regulation is most adaptive and desirable (e.g., Bretherton, 1990; Stern, 1985; Tomkins 1962, 1963).

Other infants, with an insecure-avoidant attachment style, attenuate emotional responding during the strange situation. Studies indicate that avoidant infants have experienced consistent rejection by their caregiver, particularly in times of distress (Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985). Within this

caregiving context, the infant's apparent rebuff of the caregiver and low emotionality give the infant the greatest likelihood of remaining close to the attachment figure while minimizing chances of being rejected (Cassidy, 1994; Main & Solomon, 1986). Studies indicate that these infants do tend to show lower separation distress intensity and take a longer time to become distressed when compared to securely attached infants but also show a bias in coping strategy such that they are more likely to regulate emotions with self-soothing and solitary exploration with toys when compared to other attachment groups (Braungart & Stifter, 1991; Nachmias et al., 1996).

This apparent low-emotionality seen in insecure-avoidant infants does not, however, mean that they are less distressed. In fact, studies measuring physiological responding have shown that avoidant infants are just as distressed (heart rate), or more so (salivary cortisol), when compared to secure infants (Spangler & Grossmann, 1993). It is also notable that several studies have found that these infants communicate with their mothers directly only when feeling at ease and, overall, tend to display less positive emotions (Grossmann, Grossmann, & Schwan, 1986; Matas, Arend, & Sroufe, 1978; Pastor, 1981; Waters, Wippman, & Sroufe, 1979). While such regulation is adaptive within the attachment relationship, as the child continues to develop, a lack of affect display in most other contexts may appear inappropriate and maladaptive (Cassidy, 1994).

A third pattern of emotion regulation is demonstrated by insecure-resistant infants who are thought to experience minimally or inconsistently available parenting (Ainsworth, 1978; Belsky et al., 1984; Grossman et al., 1985). This

pattern of responding includes heightened emotional expression, in what is thought of to be a strategy to increase the likelihood that they will attain attachment needs from the caregiver (Cassidy, 1994). It has been argued that if the infant allows him or herself to relax and be soothed, they run the risk of losing contact with the inconsistently available parent (Cassidy, 1994). Studies confirm that resistant infants not only exhibit more intense separation distress and take longer to recover than securely attached infants, but also show fewer self-regulatory behaviors during reunion (Thompson, Flood, & Lundquist, 1995). They appear to be overly focused on the caregiver throughout the strange situation and are less able to use contact from the caregiver upon reunion to assuage distress. Emotion regulation development within this context may result in under regulation of negative emotion, including heightened fear reactions (Jacobson & Wille, 1986; Calkins & Fox, 1992). These children may become overly inhibited due to this preponderance of fear and display emotion regulation difficulties which would likely lead to peer and academic difficulty. Some studies find support for the association of insecure-resistant attachment and the development of inhibition, or over-regulatory, emotion regulation style (Kochanska, 2001).

A minority group of infants display odd, conflicted behavior and display no consistent systematic strategies when interacting with the caregiver during the strange situation. Lyons-Ruth, Bronfman, & Parsons (1999) found that mothers of disorganized infants demonstrated communication errors and contradictory messages, as well as responded inappropriately, or not at all, to clear communications by the infant. They also found that frightened and/or frightening

behavior displayed by the caregiver (as originally identified by Main and Hesse, 1990, 1992) discriminates disorganized infants from other attachment groups. A number of studies have related an increased incidence of disorganized attachment to maternal risk factors such as maltreatment, depression, adolescent parenthood, or alcohol consumption (Lyons-Ruth, 1999).

Main and Hesse (1990) argue that no coherent pattern of emotion regulation is associated with this attachment style. And indeed, infants and toddlers with disorganized attachment have been found to exhibit greater physiological stress to the strange situation, which is not associated with difficult temperament (Barnett et al., 1999; Herstgarrd, Gunner, Erickson & Nachmias, 1995; Spangler & Grossmann, 1993). Barnett et al. (1999) concluded that disorganized attachment likely interferes with the development of emotion regulation. Furthermore, longitudinal follow up studies indicate that children with disorganized attachment are at risk for developing conduct problems, such as aggression toward peers at age 5 (Lyons-Ruth, 1996).

Research comparing emotion regulation among different attachment styles indicates that the effects of attachment on emotion regulation strategies do indeed extend beyond the infancy period (Calkins & Fox, 1992; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Kochanska, 2001; Miyake, Chen, & Campos, 1985). Gilliom et al., (2002) assessed 282 preschooler boys' attachment at 1.5-years old, emotion regulation with a frustration inducing 'waiting paradigm' at age 3.5-years old, and indices of self control at 6-years old. They found that not only did the use of specific strategies predict lower anger reaction, but that secure attachment at 1.5-

years old was related to the specific emotion regulation strategy of attention distraction at 6-years old, which led to successful waiting and emotion regulation.

Kochanska (2001) conducted a longitudinal investigation of attachment's effects on emotional development with 112 children and found that insecure-resistant infants displayed more fear, both frequency and intensity, at the end of 1 year when compared to other attachment styles. However over the 2nd and 3rd years secure children displayed less anger while, generally, insecure children's negative emotions increased. Kochanska (2001) observed that over time the insecure-resistant infants displayed an increase in fear reactions. It is also notable that even when confronted with episodes designed to elicit joy, insecure-resistant infants predominantly displayed fear. Additionally, insecure-avoidant children became more fearful over time, while disorganized/unclassifiable children became more angry. While these data support that deviations in supportive caregiver-child relationships may contribute to differential, maladaptive patterns of emotion regulation later in childhood and into adulthood (Cassidy, 1994; Hofer, 1994), they do not take into consideration child-centered factors, such as temperament and language skill, which are known to affect emotion regulation.

Beyond classifications: Stability of attachment style. Investigations with samples of low-risk, middle-class children reflect the relative stable nature of the attachment relationship. Under conditions of relative parental and ecological stability, continuity in children's attachment patterns has been found across several years, from 6 months (Waters, 1978) to 6 years (Main, Kaplan, Cassidy, 1985; Main & Cassidy, 1988; Wartner, Grossman, Freemer-Bombik, & Suess, 1994). As part of a

larger study on childcare, Howes and Hamiton (1992) tested the stability of attachment classification of 23 children over a period of 7 months. They found that 87% of cases received the same attachment style classification at 12 months old (coded from the strange situation) and 19 months old (coded from a reunion between mother and child at school by Q-sort) (κ for stability = .49, $p < .05$). Some support has also indicated that changes in familial patterns, such as parental work pattern, does not affect attachment style. For instance, Owen, Easterbrook, Chase-lansdale, and Goldberg (1984) measured infant attachment stability, at ages 12 and 20 months, in mother-child dyads with working versus nonworking mothers and found no differences in stability between the two groups.

On the other hand, it appears that instability in attachment relationships occurs more than was originally documented. Belsky, Campbell, Cohn, & Moore (1996) found that attachment stability across 6-month periods to be no greater than chance. Several studies show that instability of attachment relationships is associated with greater ecological risk. In general, as the types of parenting problems increase in severity, rates of atypical patterns of attachment increase and rates of security decrease (Lyons-Ruth et al., 1991; Spieker & Booth, 1988; van Ijzendoorn et al., 1992). Schneider-Rosen et al. (1985) found that fewer than half of maltreated children received the same classification across both 12 to 18 and 18 to 24 months, while nonmaltreated children demonstrated greater stability than could be expected by chance. Barnett, Ganiban, & Cicchetti (1999) measured temperament and attachment in 44 matched, maltreated/nonmaltreated child-caregiver dyads and found that maltreated infants were more likely to be classified

as disorganized at all ages while nonmaltreated were more likely to be classified as secure at 18 and 24 months. However, there was no difference in the stability of classification between maltreated and nonmaltreated from 18 to 24 months. These data indicate that while maltreatment likely has an effect on the type of attachment and earlier levels of stability, maltreatment may not affect stability of the attachment relationship later in childhood. Thus, even for those child-parent dyads presented with significant challenges, the effects of the early attachment relationship may continue, in a stable fashion, into middle childhood.

Debate has also taken place regarding the stability of, specifically, disorganized attachment. Some have asserted that the disorganized pattern of attachment is a transitional strategy, evoked during times of ecological stress, such as maltreatment (Carlson, Cicchetti, Barnett, & Braunwald, 1989). Recent research, however, indicates that disorganized attachment is relatively stable (Barnett et al., 1999; Vondra et al., 1999). Barnett et al., (1999) concluded that disorganized attachment is not likely transitory, at least through toddlerhood, as 66.7% of disorganized, maltreated children received the same classification at both 12 and 18 months of age, indicating stability that was greater than what would be predicted by chance. While this data points toward stability, more research on this attachment style's course overtime is needed.

It is also apparent that child-centered factors may affect attachment stability. Using the strange situation at 12 and 18 months of age, with 90 low-income child-mother dyads, Vondra, Dowdell, Hommerding, & Shaw (1999) found relative stability among low-risk infant-mother dyads coded as secure at 12 months. Vondra

et al. (1999) also found that 8% of the sample showed a stable pattern of organized insecurity (avoidant or resistant). It was noted that those children that displayed a trajectory toward organized resistance appeared to be a group of hard-to-care for (temperamentally difficult) infants whose mothers grew increasingly anxious and depressed. Thus, in addition to maternal and environmental factors, child-centered factors contributed to the type and stability of attachment relationship.

Integrating attachment and child-centered factors. Some studies have found that effects of family environment and early relationships on emotion regulation are moderated by child gender. For instance, Denham & Kochanoff (2002) found girls to be more sensitive to negative family emotional climate. When investigating pathways to emotion regulation in a population of adolescents who had received psychiatric inpatient hospitalization, Adrian et al. (2009) also found support for this idea in that family relationship variables were related to emotion regulation for girls, but not boys. This pattern has been studied most often in regards to concurrent familial functioning rather than investigating longitudinal effects. The current study hopes to ascertain if associations between attachment and emotion regulation development are moderated by gender over several years of development.

Attachment and biological factors, such as temperament, are likely best conceptualized as reciprocal relationships. In Barnett et al.'s, (1999) study of attachment, it was concluded that the longitudinal data supported a transactional model of attachment in which child cues influenced parenting behavior, while parenting behavior, especially in extreme cases, affected children's style of negative

expressivity. Mother-infant, co-regulated communication patterns and more responsive parenting are positively related to regulation (as measured by vagal-tone, an index of the parasympathetic nervous system's capacity to regulate sympathetic arousal), whereas maternal intrusiveness and restrictive parenting are negatively related to such regulation (Calkins et al., 1998; Haley & Stansbury, 2003; Kennedy, Rubin, Hastings, & Maisel, 2004; Porter, 2003). Reciprocally, as mentioned above, a child's reactivity, or temperament, also predicts caregiver-child relationship factors (Goldsmith & Alansky, 1987; Sroufe, 1985). Thus, attachment and temperament likely interact over time, in a reciprocal fashion, to influence the manner in which emotion regulation develops.

Temperament

It is widely accepted that children are born with some degree of innate emotional and physiological arousal regulation; often referred to as temperament. In fact, research supports that until about 3 months of age, efforts at emotion regulation within the child are controlled largely by innate physiological mechanisms (Derryberry & Rothbart, 2001; Kopp, 1982; Rothbart, Derryberry & Hershey, 2000). Rothbart and Bates (2006) define temperament as constitutionally based individual differences in reactivity and self-regulation in the domains of affect, activity, and attention. This reactive dimension of emotion regulation, as opposed to the control dimension, is likely influenced by genetic and biological factors (Fox & Calkins, 2003; Rothbart & Sheese, 2007).

Individual differences in temperament are apparent shortly after birth (Gartstein & Rothbart, 2003) and the observation of such individual differences has

generated many dimensions aimed at accurately describing this phenomena including fear, frustration, negative affect, extraversion/surgency, orienting/perceptual sensitivity, and effortful control (Putnam, Ellis, & Rothbart, 2001). Although a consensus regarding a taxonomy of these factors has not been reached, based on a review of the extant literature Derryberry and Rothbart (1997) proposed three emotional defense and approach systems that describe the basic dimensions of temperament. They labeled these three systems the defense and harm-avoidance system, the approach system, and the nurturance/affiliation system. They proposed that differences in such dimensions are the basic components of temperament and the over- or under- activation of such temperamental systems promote maladaptive responding (Rothbart & Sheese, 2007).

Temperament reciprocally interfaces with other developmental systems throughout childhood. For instance, temperamental defense and approach systems likely alter attention and processing of sensory information (LeDoux, 2000; Ohman & Mineka, 2001), and subsequently alter emotional outcome when the individual is presented with a stimulus. Support has been found for this in adults such that negative affectivity, neuroticism, and trait anxiety are related to differential patterns of looking to various kinds of threatening stimuli (e.g., Mogg, Bradley, & Williams, 1995). A variety of evidence also links difficult temperament to aspects of physiological responding such as heart-rate, vagal tone, cortisol secretion, and metabolic changes (Beauchaine, 2001; Bradley, Cuthbert & Lang, 1999; Kagan 1998; Rothbart & Bates, 2006). The development of temperament, overall, and it's reciprocal interaction with internal and external stimulation of emotion over time

likely contributes to the developing child's emotion regulation. In a study conducted by van den Boom (1989), distress proneness, measured by the Neonatal Behavioral Assessment Scale at 15-days old, predicted insecurity of attachment, as measured by the strange situation, at 12 months of age. Difficult temperament, measure in infancy, thus appears to be related to later emotional functioning and to the nature of relationship interactions.

Although strong relations have been found between early measurements of temperament and later emotion reactivity and expression, some studies have found that the developmental course of temperament is not consistent over time. During the time from birth to early infancy (2 to 4 months of age), for instance, marked instability has been observed (Birns, Barten, & Bridger, 1969). Activity measured for temperament is linked mostly to distress early in infancy while children by 2 to 3 months of age demonstrate motor activity when in an alert, nondistressed state, and when they are orienting toward objects or people (Wolff, 1965). Rothbart and Bates (1998) argue that the instability of measurement in early temperament may be due to the measurement of activity level which is first linked to negative affect, and then later, positive affect.

In the later half of the first year, orienting systems undergo major development (Rothbart, Posner, & Rosicky, 1994). Visual orienting is less reflexive and begins to reflect the infant's anticipation of future location of events, based on past experiences (Johnston et al., 1991). Studies have found support for stability of negative and positive reactivity from 6 months into middle childhood. For instance Rothbart, Derryberry, and Hershey (2000) found considerable stability of smiling

and laughter from 3 months of age onward, which was also related to approach systems of temperament from 6 to 13.5 months of age. In regards to self-regulatory or effortful attentional control, Rothbart and Bates (1998) concluded that these regulatory systems develop predominantly beginning in late infancy through toddler and preschool periods, although its development may continue through adolescence. These data indicate that some aspects of temperament may begin to be stable during the later half of the first year of life but that other aspects continue to develop through childhood, and perhaps, into adolescence.

Several studies have shown, however, that individual differences in temperament are likely stable and associated with emotion regulation over longitudinal measurement. For example, studies utilizing the vagal tone, have found that measurements are consistent and stable over time, suggesting reactivity may be a stable, intrinsic contributor to individual differences in children's development (Bar-Haim et al., 2000; Bornstein & Suess, 2000; Calkins & Keane, 2004; Doussard-Roosevelt, Montgomery & Porges, 2003). Bornstein & Suess (2000) measured longitudinal consistency and stability of temperament with 81 children and found that baseline vagal tone regulation and heart rate regulation increased over time, but that children's specific levels of regulation were stable. These data are evidence of continued maturation in temperament systems through childhood, but also indicate that individual differences in temperament may be stable over time.

Temperament and emotion regulation. It is also notable that temperament has been related with emotion regulation in several longitudinal studies. For example, in a study with 26 children that measured temperament at infancy and 7

years of age, Rothbart et al. (2000) found that infant temperamental reactions of fear predicted later childhood expressions of fear, sadness, and shyness. Moehler et al.(2008) measured temperament reactivity of 95, 4-month olds by scoring crying and motor activity during observations, and found that this predicted later behavioral inhibition, or fear, in the second year of life. These data indicate that early temperamental qualities likely have longitudinal consequence on emotion regulation in childhood.

Studies that have measured temperament via the vagal tone procedure during preschool have found that high baseline recordings were associated with increased social competence, attention, and low levels of behavior problems (Eisenberg et al., 1995; Fox & Field, 1989; Mezzacarpa, Kindlon, Saul, & Earls, 1998). In a cross-sectional study, El Sheikh, Harger, and Whitson (2001) measured temperament (by vagal tone), health and internalizing/externalizing behaviors, with seventy-five 8- to 12- year olds and found that low baseline recordings were associated with increased depression and decreased self-worth but not other emotional regulation factors. In regards to higher physiological regulation, El Sheikh et al. (2001), found that it was a protective factor, buffering children from self reported anxiety, and parent reported internalizing, health, and behavior problems.

Measurement. There appears to be some debate over measuring the construct of temperament, in that some propose it overlaps or is analogous with emotion regulation, which confounds its association with attachment, as measured by the strange situation. Negative expressivity has, in fact, been found to predict the manner in which secure and insecure attachments are expressed. Belsky and

Rovine (1987) assessed 184 3-month olds with the Brazelton Neonatal Behavior Exam and the strange situation and found that temperament reports discriminated infants classified as high reactivity or low reactivity, but did not distinguish secure versus insecure classification. In fact, secure and insecure infants did not differ on any temperament measures. Temperament may affect the degree to which the infant becomes distressed during the strange situation, but not how they regulate affect, with or without the assistance of the mother. Temperament is thus associated to the child's reaction, while the attachment relationship is associated to the relationship history. Emotion regulation is thus, likely a product of the complex interaction of early relationship and child-centered factors.

Taken together, data regarding temperament indicate that it likely has a role in the development of emotion regulation early on that may wane over time. Temperament appears to change in its development over time, but remains relatively stable in regards to individual differences. Difficult temperament characterized in the above studies by high reactivity, low physiological regulation, and unsoothability, may be a risk factor for the development of emotion regulation problems. It is, however, still unclear at this point how early measurement of temperament is associated with emotion regulation in middle childhood within the context of other developmental risk factors, as few studies that span more than 6 months to a few years or collect data at more than two time points have been conducted (Rothbart et al., 2000). The current study attempts to clarify the role of early temperament in the development of emotion regulation within the context of attachment, while taking language skill into account.

Language

The availability of coping resources and strategies is associated with emotion regulation development (Thompson, Flood, & Lundquist, 1995). In general, research supports that if adults and children can find ways of expressing themselves in an adaptive manner, including the use of language, they are more capable of regulating emotions appropriately (Thompson, 1994). Language is often used in childhood to secure or enact coping strategies such as distraction, evidence or attention illiciting, and agentic self-managing talk (Eisenberg, 2005; Kopp, 1982). The use of language also translates into a greater ability to deal with peers and teachers in the school environment. Consistent with a multi-deterministic view of emotion regulation, one must consider language because it develops concomitantly and interacts with factors such as the attachment relationship and temperament to affect the overall outcome of emotion regulation (Gross, 2007).

Language and emotional development. In general, early language development is dichotomized into pre-intentional and intentional communication. Pre-intentional communication is often characterized as social in nature (e.g., eye-gaze, giggling, gesturing, facial expressions) without specific motivation or goal attainment (Bates, 1976). This type of communication occurs from approximately 1-9 months of age. Then, in approximately the 9th or 10th month communication moves to intentional, or representing and utilized for specific meaning and motivation (Bates, 1976). Interestingly, around the time that the child's emotion regulation begins to develop from external orientation (caregiver) to internal orientation (self-initiated strategies), the child also moves from pre-intentional

language to intentional language. The use of intentional language is a new level of representational thinking, a cognitive jump in development, and also provides new opportunities to develop regulation strategies.

Language skill significantly facilitates young children's capacities to understand, convey, reflect on, and manage their emotions (Kopp, 1982) and has been shown to be associated with several components of emotion regulation. For example, Stansbury & Zimmerman (1999) found that preschoolers' language skills were positively correlated with their ability to use non-verbal distraction in a frustrating circumstance. In an effort to understand the association of language skill with emotion regulation, Eisenberg (1995) tested 380 children 7 to 14- years old on language, emotional understanding, and behavioral outcome. It was found that those with language deficits made significantly more errors on verbally mediated emotional stimuli when compared to those without language deficits. Those children with language deficits also had significantly more problems identifying the feelings of participants in a conflict, identifying and evaluating strategies to overcome conflict, and knowing when a conflict was resolved. Eisenberg concluded that deficits in language skills are likely a risk for children developing emotion regulation skills.

Emotional understanding, one component of social cognitive processing, is the ability to successfully attend to and comprehend one's own and other's emotion related information, as well as relate the causes and consequences of emotion (Eisenberg, 2005). Emotional understanding involves verbal labeling of internal states, and also knowledge about emotion-related processes and their causes and consequences. This is thought to allow the child to effectively gain the information

s/he needs to use to regulate emotion. Verbal abilities have been correlated with children's emotion understanding (Curring & Dunn, 1999; De Rosnay & Harris, 2002) and shown to predict emotional understanding years later (Schultz et al., 2001). Language skill likely continues to affect emotion regulation throughout childhood, as those who are better able to communicate with others have more opportunity to learn about mental states, including emotions (Eisenberg, 2005; Stevens & Bliss 1995).

Language and emotion regulation. Language impairment is a significant risk factor for the development of psychiatric disorder (Beitchman, Nair, Clegg, Gerguson, & Patel, 1986; Cantwell & Baker, 1991). In fact, longitudinal studies have indicated that negative outcomes for children with language impairments increase over time (Beitchman, Wilson, et al., 1996; Cantwell & Baker, 1991). Language impairment has been associated with difficulties conceptualized as self and emotional under-regulation, such as conduct disorder and ADHD, and over-regulation, such as anxiety and depression (Beitchman et al., 1996; Brinton & Fujiki, 1993; Cantwell & Baker, 1991; Carson, Klee, Perry et al., 1998; Gertner, Rice, & Hadley, 1994). Overall, the co-occurrence rate of behavioral problems and language limitations is between 50-70% (Redmond & Rice, 1998).

It is likely, again, that this child-centered factor, language skill, reciprocally interacts with attachment factors to affect emotion regulation through development. Eisenberg (2005), states that children who engage in more adaptive emotion regulation likely elicit more complex language from parents, because adults may feel that the better regulated child is more attentive and verbally advanced. Some

support has been garnered for this, in that Dixon and Smith (2002) found that greater infant regulation (attention span and attention persistence) was associated with later language skills at an eight to nine month follow-up. Because studies have shown that the prevalence of disorder increases with time among those that experience language deficits, it is important to fully understand the compounding risk of transactional child-centered factors on emotion regulation, within the context of attachment, into middle childhood.

The Current Project

Emotion regulation is thought to have wide reaching affects in the child's life. From academic success and peer relations, to dealing with stressors, this type of self-regulation is pervasive in children's functioning. Research indicates that emotion regulation is likely multi-determined by child-centered factors, such as temperament and language skill, and early relationship factors, such as attachment style. Additionally, socio-demographic factors such as gender, ethnicity, and family resources have also been found to be associated with emotion regulation. However, a frequent challenge when investigating emotion regulation's early relational roots is obtaining adequate group sizes in respect to attachment group and diversity. Furthermore, much of the existing data on emotion regulation are cross-sectional in nature, which has inherent contributions and limitations. Data that is longitudinal has provided a glimpse into emotion regulation development, but not into middle childhood. This data has helped clarify understanding of emotion regulation outcome, but adds little to our understanding of change or development over time. Longitudinal data gathered over more than two time points is needed to clarify the

role of child-centered and early relationship factors in emotion regulation development. Such information will affect developmental theory, our conceptualization of emotion regulation development, and potentially, clinical intervention.

Specific to our understanding of emotion regulation development, few studies have examined associations between early relationship and child-centered factors (Barnett, et al., 1999, Thompson, 1999). Rather, many studies have investigated one type of factor, child-centered or early relationship, and have relied on cross-sectional methods or collecting data at only one follow-up point. Recent data indicate, however, that these factors likely reciprocally interact over an extended time (Barnett et al., 1999; Beitchman, Wilson, et al., 1996; El Sheikh, et al., 2001; Kochanska, 2001). Examining how child-centered and early relationship factors affect emotion regulation over several data point collections may provide a framework to guide efforts to understand behavioral and emotional disorder in middle childhood.

Using latent growth modeling, the present study examines the impact of the antecedents temperament and language skill, as well as ethnicity, family resources, and gender on trajectories of emotion regulation, measured at 4 time points during middle childhood, overall and within the context of each attachment style. Overall, it is hypothesized that emotion regulation will evidence growth from 3rd to 6th grade. It is also hypothesized that differential growth trajectories according to attachment classification will emerge. It is believed that secure attachment will create a robust enough environment such that the lower family resources, minority status, female

gender, difficult temperament, and low language skill will not affect emotion regulation development. More specifically, for those children classified as securely attached, initial emotion regulation scores and their growth will not be predicted by language skill, temperament, ethnicity, family resources, or gender. For those children classified as insecure-avoidant and insecure-resistant attached, initial emotion regulation will not be predicted by antecedents (temperament, language ability, ethnicity, income to needs ratio, or gender). However, temperament and language skill as well as ethnicity, family resources and gender will predict growth such that they will be associated with increasing emotion regulation difficulties over the 4 year period. Finally, for those children classified as disorganized, all antecedents will predict initial levels of emotion regulation difficulty as well as growth trajectory.

CHAPTER 2 METHODS

The Study of Early Child Care and Youth Development Database

The current study utilized data collected as part of the comprehensive National Institutes of Child Health and Development (NICHD), Study of Early Child Care and Youth Development (SECCYD). The primary purpose of the SECCYD was to examine how variations in child care relate to children's social-emotional adjustment, cognitive and linguistic development, and physical growth and health. Data was collected from 1364 families, at 10 sites around the United States in three phases (phase I - birth to 3 years; phase II – 54 months to 1st grade; phase III 2nd to 6th grade).

A myriad of papers and texts have resulted from the SECCYD data collection effort that have greatly informed developmental science. The majority of studies utilizing the database have focused on the effects of early nonmaternal versus maternal child care. An overview of results found by the NICHD Early Child Care Research Network (2001) stated that by 12 months of age, 80% of children had experienced regularly scheduled nonmaternal care, with 44% enrolled in child-care homes or centers. Family risk factors (psychosocial, socioemotional, and sociocultural), versus quality and hours in child care, were the strongest predictors of all outcomes, including behavior problems, prosocial behavior, and language skills. However, after controlling for child and family variables, quality of nonmaternal care is still predictive of all child outcomes (attachment, parent-child relationship, noncompliance in child care, problems behaviors, cognitive development, school readiness, and language development) during the first 3 years

of life. Additionally, quantity of nonmaternal care was negatively associated with parent-child relationship variables, such as maternal sensitivity and child positive engagement, and social competence and positively associated with problem behaviors. They concluded that, in general, the impact of early child care experiences cannot be adequately assessed without reference to children's experiences with their families.

While a comprehensive overview detailing studies conducted with phase II data has not occurred to date, investigations released indicate that quality of nonmaternal care continues to be important through first grade. As the children entered school at the end of phase II, findings also centered on peer socialization, attention and memory, and academic risks and achievement. For example, a recent study released by the NICHD Early Child Care Research Network (2007) that sampled 700 children in first grade, revealed that the cumulative quality of the child-rearing environment in infancy was related to attention and memory but not to planning. Furthermore, the quality of the family environment was more strongly associated with outcomes than child care and school environments. To this end, findings with the SECCYD data are consistent with the current study's focus on contextualizing emotion regulation when investigating child-centered factors by considering the early child-caregiver relationship.

Procedures

Across sites, professionals were trained to collect and enter data. Extensive data accuracy checks were performed by the SECCYD. Participants were recruited over a period of 10 months at site hospitals chosen on the basis of competing

scientific merit. A succession of 24 hour sampling periods were devised at each site hospital. Participants were randomly chosen from all single birth babies that left the hospital 7 days after birth, and whose mothers were over the age of 18. Mothers were approached during their hospital stay after giving birth, were told of the study, and asked if they would like to be contacted at a later time. All participant data was included in the current analysis; no inclusion or exclusion criteria based on demographic data will be utilized.

Data collection began shortly after birth and concluded in 2004, as the children turned 13-years old. The SECCYD used hundreds of measures assessing child care, family environment, and child characteristics including intelligence, academic achievement, and behavioral outcome which were measured at home and at site labs. The current study will utilize measurements of emotion regulation, attachment style, temperament, and language skill to predict emotion regulation.

Measures

Emotion regulation. Emotion Regulation was measured in 3rd through 6th grades by administration of the Parent Report of Child Reactions (P-RCR) which is displayed in Appendix I (Eisenberg et al., 1991; Eisenberg et al., 1995). Parents were asked to complete this questionnaire, designed to measure their perceptions of how the child expresses emotions in response to events. The scale consists of 10 items designed to tap the child's frequency and intensity of emotions on a 5 point scale ranging from 1 = never to 5 = always. Example items are, 'When angry, it is easy for my child to still be rational and not overreact', and 'When my child feels an emotion, either positive or negative, my child feels it strongly'. The primary care

giver reported child emotional regulation score is computed as the weighted sum of the responses to items 1 to 10, with items 4,5,6,8, and 10 reflected. Possible scores on this composite variable range from 10 to 50, with higher values indicating higher perceived emotional reactivity and lower emotional regulation. Internal consistency reliabilities for the P-RCR composite score are as follows, $r = .76, .74, .77$ and $.78$ for third, fourth, fifth and sixth grades, respectively. Eisenberg et al., (1995) found that the P-RCR was negatively correlated with vagal tone measurements ($r = -.54, p < .001$), demonstrating concurrent validity. They also demonstrated predictive validity, as the P-RCR was administered in preschool and was significantly associated with measurements of emotionality and behavior at home and at school, at a 3 year follow up ($r = .30$ to $.70, p < .001$).

Attachment. Attachment was measured using the strange situation at 15 months. Procedures for the strange situation were derived from Ainsworth, Blehar, Waters, and Wall (1978). Excerpts from the original text and a table describing the 8 consecutive 'episodes' which occur from least to most stressful, finally ending in the child – caregiver reunion, are contained in Appendix II. Each dyad was filmed through an observation room. The SECCYD utilized coding procedures from Ainsworth et al. (1978) to code secure and insecure styles, and from Main and Solomon (1990) to code disorganized/disoriented attachment style. Coding occurred over a 60 week period and was completed by 4 individuals at the Seattle site. Extensive training commenced, occurring over 208 hours including readings, lectures, and discussions over videos and reliability coding. Reliability information was obtained from pairs of coders, each of whom scored a total of 1140 tapes from

the 10 collection sites. The NICHD Early Child Care Research Network (1997) reported 83% agreement ($\kappa = .69$) in attachment style classification. Disagreements were viewed by the group and discussed until a code was assigned by consensus. In regards to classification group sizes, 63.95 % (N = 729) were classified as secure, 4.47% (N = 50) were classified as insecure-avoidant, 14.74% (N = 169) were classified as insecure-resistant, and 16.84% (N = 192) were classified as disorganized. Differences among sites were also tested and found non-significant ($\chi^2 = 31.816, p < 0.239, DF = 27$).

Temperament. Temperament was measured at 6 months of age using an adaption of the Early Infant Temperament Questionnaire (EITQ), the My Baby questionnaire which is displayed in Appendix III (Medoff-Cooper, Carey & McDevitt, 1993). Primary caregivers were administered the questionnaire during a home visit. Five aspects of temperament (approach, activity, intensity, mood, and adaptability) were assessed with 42 items that describe children's reactions to different situations. Items are rated on a 7-point scale ranging from 1 = extremely untrue to 7 = extremely true to reflect the child's reactions during the past 6 months. A total battery composite score was computed, which is the mean of non-missing items with appropriate reflection of items so that numerically large scores consistently reflect a more difficult temperament. Examples of items are, 'This baby adjusts within 10 minutes to new surroundings (home, store, play area)', and 'This child plays actively with parents - much movement of arms, legs, body.' This measure has a high degree of internal consistency (Cronbach's alpha = .811) and Rothbart,

Ahadi, & Hershey (1994) established adequate predictive validity for this measure showing that it reliably predicted parent temperament ratings at 6-years old.

Language skill. Language was measured using the Preschool Language Scale – 3 (PLS-3) at 54 months during home visit. The Preschool Language Scale– 3 (PLS-3) assesses vocabulary, grammar, morphology, and language reasoning. The test is comprised of two parts: (a) the auditory comprehension scale that measures receptive vocabulary and; (b) the expressive communication scale that assesses what children actually say or produce. For the purpose of this study, the Total Language Standard Score will be used. This is derived by obtaining a composite score for all subtests and is standardized with a mean of 100 and standard deviation of 15, with possible values from 50 to 150. For children ages birth to 6 years, 11 months, cronbach's alpha ranges from .74 to .92. Concurrent validity was measured, as the total language score correlates highly ($r = .82$) with the gold standard measure, the Caldwell Preschool Scale for the total language score (Zimmerman, Steiner, & Pond, 1992).

Socio-demographic data. Child ethnicity as well as gender were recorded during introductory demographic data collection upon entering the SECCYD study. Family resources data, including household income and dependants was collected at each data collection follow-up during phase I. The income to needs ratio was computed based on total family income (including mother's income, other sources of income, husband's/partner's income) relative to the poverty threshold for a household. The average income to needs ratio over 1 to 36 months was computed for cases with at least one income-to needs ratio based on total family income from

1 to 36 months. The poverty threshold for a household was determined by the year the income was earned, the total number of members in the household, and the number of children living in the home. Poverty thresholds for the 1991-1995 U.S. Census Bureau, Current Population Survey were used to make poor versus not poor distinctions. Although the variable is continuous, general operational cutoffs are as follows; poor (ratios less than 1.0), near poor (ratios from 1.0 to 1.7), and not poor (ratios greater than or equal to 1.8). The mean value of average income to needs ration from 1-36 months is 3.38, and there are significant differences by site and by child's ethnicity.

CHAPTER 3 RESULTS

Preliminary Data Analysis

A total of 7 variables (attachment, gender, ethnicity, family resources, temperament, language, and emotion regulation) were examined in this study. Data were reviewed using standard data cleaning procedures (Tabachnick & Fidel, 1996). No outlying data points were found and emotion regulation, temperament, and language were normally distributed while the income to needs ratio was highly negatively skewed. Only 10.3% of families were classified as 'poor' by the ratio. This is consistent with the overall level of maternal education found in the sample; 30.6% graduated from high school only, while 33.6% did 2 years of post high school education and 33% engaged in 4-5 years of post-high school education. The current study focused on differences between African American and Caucasian youth and thus 91 cases from the database were not utilized in analyses because they identified as American Indian, Eskimo, Asian, Pacific Islander, or 'other'. This resulted in a total sample size of 1273 children. Descriptive information for variables in the overall sample and each attachment style is found in Table 1. Bivariate associations among antecedents were investigated and are displayed in Table 2. By examining the correlation matrix of emotion regulations at each time point displayed in Table 3, it is apparent that much variation is accounted for by shared methods variance or construct continuity.

Missing data analyses and differential attrition. Summary statistics for the missing data analyses are presented in Table 4. The vast majority of cases, 70.2%, have no missing data. The second highest pattern was those cases for which

attachment data at 15 months was not obtained or was not codable. Cases with missing data on the attachment variable were not used in the multi-group latent growth model. Cases were coded for the top three missing data patterns and an ANOVA was performed; no significant differences on emotion regulation at any time point were found between the missing data pattern groups. Thus, it was concluded that the data at least met the definition of missing at random (MAR) (Little & Rubin, 1987). By Phase III, 152 participants had dropped out of the study. Drop out was not significantly associated with attachment style ($\chi^2 (1, 1118) = 1.297, p > .05$), child's temperament ($F (1, 1195) = .307, p > .05$), child's language skill ($F (1, 991) = .425, p > .05$), or family resources ($F (1, 1213) = 1.593, p > .05$). Attrition was, however, significantly related to ethnicity ($\chi^2 (1, 1118) = 11.533, p < .001$), such that African American families were more likely to drop out. Twenty-one percent of African Americans dropped out (compared to an expected 11.5%) while 10.1% of Caucasian Americans (compared to an expected 11.5%).

Repeated measures analysis of variance. In order to ascertain if emotion regulation differed significantly by attachment style a repeated measures ANOVA was run. Across the 4 year time interval, within-subjects effects were statistically significant, estimated with the Huynh-Feldt statistic [$F(3, 790) = 5.850, p < .01$]. The proportion of partial population variance explained by the within-subjects main effect was medium, as designated by the partial *Eta Squared*, $\eta^2 = .07$ (Levine & Hullett, 2002). Partial *Eta Squared* is an index of effect size describing the observed proportion of explained variance in which .01 may be considered small, .06 may be considered medium, and .16 may be considered large (Snyder & Lawson, 1993).

This indicates that there is significant change in emotion regulation over time, with a medium proportion of the variance accounted for by attachment style category. Results also demonstrated that mean differences between attachment groups on emotion regulation at each time point are statistically different, again estimated with the Huynh-Feldt statistic [$F(9, 17.795) = 1.935, p < .05; \eta^2 = .07$]. Between subjects effects indicate nonsignificant differences between attachment groups, overall, on measurements of emotion regulation [$F(3, 792) = 0.175, p > .05$].

Latent Growth Curve Modeling

Preliminary analysis indicates significant change over time and differences in change between attachment groups. Because repeated measures ANOVA does not adequately permit the prediction of change over multiple time points, a latent growth curve (LGC) modeling approach was employed (Duncan, Duncan, Strycker, Li, & Alpert, 1999). After modeling emotion regulation growth for the overall sample, a second multi-group model was run in which attachment style was used as a grouping variable in order to ascertain possible differences between attachment styles on initial emotion regulation as well as change over time. Antecedents, or covariates, (gender, ethnicity, family resources, temperament, and language) were specified to determine if they predict initial emotion regulation score and/or change over time for each class. Means for each time point were utilized to graph trajectories for the overall model and multi-group latent growth model (each attachment category) and are displayed in Graph 1.

LGC modeling approaches to analyzing longitudinal data involve the use of constrained structural equation models in which common variance across the

repeated measures is captured in a number of growth factors. The growth factors include a slope factor and an intercept factor, which is interpreted as the average value of the dependent variable from which growth deviates. The intercept factor has a factor mean, which is an estimate of the average intercept in the sample, and a factor variance, which is an estimate of the average variation of individuals from the sample mean intercept. The factor loadings for the intercept factor are all fixed to one to ensure that the measurement has the same scale at all time points. In addition to the intercept factor, growth models have a slope factor or factors, which estimate the general shape of the individual trajectory across time. Like the intercept factor the slope factor mean refers to the estimated average slope of the sample and the slope factor variance estimates the average individual deviation from that sample mean slope. The slope factor loadings are also constrained to reflect the scaling of time. Because an investigation of means and mean plots indicated linear growth, linear slope factor loadings were used (i.e., 1, 2, 3, 4). Additionally, factor loading were set such that the growth process was centered at the beginning of emotion regulation data collection, 3rd grade. Because the current data were normally distributed, continuous, and collected at uniform time points for each participant the data fit well into the latent growth curve model framework (Duncan et al., 1999; Raudenbush, 2001; Singer & Willet, 2003). Growth models were tested using Mplus version 5.0 software (Muthen & Muthen, 2009). All model parameters as well as residual means of the dependant variable at each time point for each model are found in Table 5.

Overall latent growth curve model. In the first analysis an overall model, containing all groups of attachment, was conducted with gender, ethnicity, family resources, temperament, and language as time invariant covariates, or antecedents. This model fit the data moderately well ($\chi^2 = 13.848$; d.f. = 15; $p = 0.537$ and RMSEA 90% C.I. = 0.000 – 0.025). The observed variable R^2 for this model were 0.705, 0.714, 0.732, and 0.789 for grades 3 through 6, respectively. The mean intercept was significantly different from zero; the average score on emotion regulation rating at 3rd grade was 29.944 ($t = 1.723$ $p < .001$) with an average rate of change of 0.655, which was non-significant. This indicates that the average rate of change of the four time points measured, across all attachment groups, is not significantly different from zero. There was significant individual variation around the intercept and slope means, indicating there is significant unexplained variance in these terms. Observed residuals also show significant variance remaining to be explained. The intercept did not significantly covary with the linear slope term ($b = -0.319$, $s.e. = 0.322$, $t = -0.323$). In the overall model, race was associated with the mean intercept such that African American children tended to be scored 1.701 points lower on emotion regulation difficulties in 3rd grade compared to Caucasian children. Additionally temperament was associated with the mean intercept such that for each point increase in difficult temperament an increase of 2.051 on emotion regulation difficulties in 3rd grade was observed. Gender significantly predicted the slope factor such that for each year of growth, males decreased 0.301 in emotion regulation difficulties. Parameters as well as residual means indicate the linear model of growth is most likely the best fit model to the data.

Multi-group latent growth curve model. Because significant unexplained variance was found in both the intercept and slope terms as well as mean residuals it is possible that a different model specification would better fit the data. In accordance with past theory and research, a multi-group latent growth curve modeling (MLGC) approach (Duncan, Duncan, Strycker, Li, & Alpert, 1999) was utilized. The 4 attachment styles (A – insecure avoidant, B - secure, C – insecure resistant, and D - disorganized) were specified as predetermined groups. Again, slope factors were specified to reflect possible linear growth (i.e., 1,2,3,4) and factor loadings were centered at 3rd grade. The latent growth curve model with predetermined groups was supported (BIC = 20624.010, Loglikelihood = -16217.917). Overall and in each class, the intercept did not significantly covary with the linear slope term ($b = -0.449$, $s.e. = 0.340$, $t = -1.321$). All model parameters as well as residual means of the dependant variable at each time point for each model are found in Table 5.

Attachment type A. The average score on emotion regulation rating at 3rd grade for those with type A attachment (insecure-avoidant) was 30.493 ($t = 7.050$, $p < .001$), which was significantly different from zero, with an average rate of change of 2.262, which was non-significant. This indicates that the average rate of change of the four time points measured is not significantly different from zero. There was significant individual variation around the intercept and slope means, indicating there is significant unexplained variance in these terms. Observed residuals also show significant variance remaining to be explained in emotion regulation at the four time points. The observed variable R^2 for this class were 0.682, 0.675, 0.699, and

0.764 for grades 3 through 6, respectively. The intercept of emotion regulation for children with insecure-avoidant attachment style was significantly predicted by child's ethnicity such that African American children tended to score 2.125 points lower than Caucasian children with avoidant attachment on emotion regulation difficulties in 3rd grade. The intercept was also significantly predicted by income to needs ratio such that for each one point increase in the family resources score (less likely to be poor), 0.510 points were gained in emotion regulation difficulties in 3rd grade.

Attachment style B. The mean intercept was significantly different from zero; the average score on emotion regulation rating at 3rd grade for those with type B attachment (secure) was 29.476 ($t = 12.538, p < .001$) with an average rate of change of 1.107, which was non-significant. This indicates that the average rate of change of emotion regulation over the four time points measured is not significantly different from zero. There was significant individual variation around the intercept and slope means, indicating there is significant unexplained variance in these terms. Observed residuals also showed significant variance remaining to be explained in emotion regulation at the four time points. The intercept did not significantly covary with the linear slope term ($b = -0.449, s.e. = 0.340, t = -1.321$). The observed variable R^2 for this class were 0.748, 0.742, 0.758, and 0.807 for grades 3 through 6, respectively. The intercept of emotion regulation for children with secure attachment style was significantly predicted by ethnicity such that African American children were scored 2.574 lower on emotion regulation difficulties in 3rd grade when compared to Caucasian children. Emotion regulation difficulties at 3rd grade were

also significantly predicted by temperament rating at 6 months such that for each point increase in temperament difficulty there was a 2.841 increase in emotion regulation difficulties at 3rd grade. Additionally, the intercept for secure children was predicted by language such that for each point increase in language skill emotion regulation difficulty decreased by 0.040. Finally, the slope term was predicted by gender such that for each year of growth, boys decreased 0.274 points emotion regulation difficulties compared to girls.

Attachment type C. The mean intercept for attachment type C children (insecure-resistant) was significantly different from zero; the average score on emotion regulation rating at 3rd grade was 29.399 ($t = 4.488, p < .001$) with an average rate of change of 1.404, which was non-significant. This indicates that the average rate of change of emotion regulation over the four time points measured is not significantly different from zero. There was significant individual variation around the intercept and slope means, indicating there is significant unexplained variance in these terms. Observed residuals also show significant variance remaining to be explained in emotion regulation at the four time points. The observed variable R^2 for this class were 0.723, 0.718, 0.734, and 0.786 for grades 3 through 6, respectively. No antecedents were predictive of intercept or slope factors for those children whom displayed insecure-resistant attachment.

Attachment type D. The mean intercept was significantly different from zero; the average score on emotion regulation rating at 3rd grade for those with type D attachment (disorganized) was 33.820 ($t = 8.708, p < .001$) with an average rate of change of -1.545, which was non-significant. This indicates that the average rate of

change of emotion regulation over the four time points measured is not significantly different from zero. There was significant individual variation around the intercept and slope means, indicating there is significant unexplained variance in these terms. Observed residuals also show significant variance remaining to be explained in emotion regulation at the four time points. The observed variable R^2 for this class were 0.677, 0.670, 0.695, and 0.762 for grades 3 through 6, respectively. No antecedents were predictive of intercept or slope terms for those children whom displayed disorganized attachment.

CHAPTER 4 DISCUSSION

Overall Latent Growth Curve Model

The current study sought to investigate the manner with which attachment, temperament, language, gender, ethnicity and family resources affect the development of emotion regulation from 3rd to 6th grade. Studies indicate that the development of greater emotional self-awareness and understanding complex social emotions occur from approximately 6 to 12 years of age (e.g., Casey 1993; Ferguson & Stegge, 1995). Further, some aspects of emotion regulation, such as reaction inhibition, appear to develop into late adolescence and even adulthood (Cunningham, Bhattacharya, & Benes, 2002; Giedd, 2004). Thus, it was hypothesized that emotion regulation would continue to develop and change through middle childhood. Data partially supported hypotheses regarding overall change, or differential change associated with attachment style from 3rd to 6th grade. While results of the repeated measures ANOVA indicate mean differences over time, LGC modeling shows that growth, as measured by changes in slope over time, is not statistically significant and may be accounted for by gender effects.

The current study supports those findings which indicate that regulation may develop into a stable style earlier than 3rd grade (Kochanska et al., 2001). Previous studies explain that between 3 and 6 months of age biological regulation processes such as eating and elimination as well as fielding stimuli due to motor developments likely occur and result in greater child initiated emotion regulation (Calkins & Hill, 2007; Harman, Rothbart, & Posner, 1997; Rothbart et al., 1992). This leap in development coincides with self-initiated distraction and disengagement of attention

in response to aversive stimuli (Kochanska et al., 2001). Again, concomitantly with motor development gains, new emotion regulation abilities emerge at the end of the first year of life (Kopp, 1982). While tactics of regulation may become more complex and differentiated over time, it is possible that regulation develops into a stable style consistent with these early developmental milestones at an age younger than previously thought.

These early regulatory behaviors are associated with cognitive (Harris, Olthof, and Meerum Terwogt, 1981) and conceptual changes (Casey, 1993) in emotional knowledge and understanding through childhood. It appears that after toddlerhood aspects of emotion regulation continue to develop in concert with commensurate physical and cognitive development and it is possible that some components of this development in middle childhood were not considered in the current study. For instance studies conducted by Harris et al., (1981) and Casey (1993) indicate that a main component of emotion regulation development from 3rd to 6th grade may be cognitive in nature which is not amenable to behavioral operationalization reflected in the parent report currently utilized. Thus, although the current study did not find results consistent with continued growth from 3rd to 6th grade, it is possible that cognitive aspects of emotion regulation continue to grow and change, but that the current measure did not measure parents' perceptions of this internal development.

In order for a child's stable regulation style to emerge, some studies indicate multiple domains require growth and change in addition to the aforementioned cognitive aspects (Gross, 2007; Thompson & Meyer, 2007). As previously mentioned, in addition to these cognitive aspects, these include control and reactive

components. Because it is possible that the current method of emotion regulation measurement may have resulted in a restricted range of variance in regards to total possible emotion regulation style development, follow-up analyses were conducted in an effort to further understand the P-RCR's measurement of this construct in the current population. Both theory and research support that problems regulating emotion are associated to both internalizing and externalizing behaviors (Gross, 2007). Partial correlations were obtained among P-RCR grade measurement (3rd, 4th, 5th, 6th) and concurrent Child Behavior Checklist – Parent Form (CBCL) (Achenbach, 1991) subscale measures of internalizing behaviors, externalizing behaviors, and the composite score of total problem behaviors. Results, displayed in Table 6, indicate that P-RCR scores are significantly ($p < .001$) correlated with internalizing ($r = 0.288 - 0.264$), externalizing ($r = 0.465 - 0.389$) and total behavioral problems ($r = 0.410 - 0.384$) at each grade. This indicates that higher P-RCR scores are generally reflective of behavioral problems both on the internalizing and externalizing scales, as well as overall behavioral difficulties. The P-RCR does, however, have a greater association with externalizing. This is consistent with Eisenberg et al., (1991, 1995) who indicated that children who score high on the P-RCR are, according to their parents, highly reactive and under-controlled in emotional expression (Eisenberg et al., 1991; Eisenberg et al., 1995).

While under-regulation of emotion is often the type of emotion regulation that is most noticed by observers due to its disruptive behavioral correlates, over-regulation of emotion also results in maladaptive affective and behavioral patterns (Gross, 2007). The over-regulation of emotion, resulting in inhibited expression may

also be related in a differential manner to attachment types. For instance, theory suggests that development within the context of insecure-avoidant attachment, versus other attachment styles, results in a learned attenuation of emotion (Cassidy, 1994; Hofer, 1994). Some evidence for an increase in a bias of fear-based responses to emotional stimuli, resulting in decreases of appropriate emotional responding, have been observed over time for those children in this attachment category (Kochanska, 2001). Because the over-regulation of emotion may not have been adequately sampled and may constitute continued growth within the context of attachment, this association must be further researched.

On the Parent Report of Child Reactions (P-RCR), the same behavioral correlates of emotion regulation difficulty were rated by parents each year. Data obtained on the P-RCR are absolute scores and not norm-referenced. A norm-referenced instrument utilizes data on a normative population to produce a standardized score which reflects how an individual's score compares to peers' scores. Because the current measure was not norm-referenced, it is possible that developmental considerations are not inherent in the scoring. For example, a high score on the item, "My child responds very emotionally to movies, stories, or events", may have different meaning in regards to normative development in 3rd grade versus 6th grade which is not captured by the measure's current scoring system. It is possible that the 3rd grader who obtains a high score on this item is in line with others' his or her age while the 6th grader who obtains a high score is not. If standardized scores were utilized those children in the higher range of scores at older ages may look *worse* compared to their peers because they are not meeting

acceptable developmental expectations. In this way, the current measure utilized may have under-identified those with increasing difficulty regulating emotions over time.

Multi-group Latent Growth Curve Model

Because the current study sought to understand emotion regulation trajectories within the context of early attachment style, a multi-group latent growth curve (MLGC) model approach was utilized. The current approach was utilized to test hypotheses regarding differential trajectories and antecedent association for each attachment style.

Predictions of emotion regulation development in relation to attachment style were not fully supported. While repeated measures ANOVA evidenced mean differences in change between attachment groups, MLGC modeling indicated no differential growth between attachment groups. It is possible that differential growth trajectories for attachment styles in the MLGC modeling were not found because emotion regulation is stable from 3rd through 6th grade across the entire population. The MLGC modeling indicates, however, that child and environmental factors differentially predict 3rd grade levels of emotion regulation difficulty according to attachment style. Thus, emotion regulation may have different growth trajectories prior to 3rd grade which result in the current study's intercepts, or initial emotion regulation levels.

Attachment type A. Those infants identified as having an insecure-avoidant attachment relationship tend to display low, overt, emotionality in response to the strange situation (Grossmann, et al., 1985). It is thought they are rebuffed by

caregivers and thus, in an effort to reduce the chance of being rejected, learn to self-soothe and distract to cope with strong emotion (Braungart & Stifter, 1991; Cassidy, 1994; Main & Solomon, 1986; Nachmias et al., 1996). These children, while not looking outwardly distressed during the strange situation, are often experiencing greater physiological distress when compared to children from other attachment groups (Spangler & Grossmann, 1993). It is thought that these children learn to attenuate emotional responding, which may lead to over-, rather than under-regulation of emotion (Cassidy, 1994). The current data indicate that those with insecure-avoidant attachment were not found to have emotion regulation difficulties associated with *high reactivity*. However, as discussed above, the phenomena of lower than normal reactivity, resulting from over-regulation of emotions, may not have been adequately tapped by the current measure.

The insecure-avoidant group was the only group for which the income to needs, or family resources, was a significant predictor of initial levels of emotion regulation difficulty. Conversely than what would be expected, greater family resources was associated with greater emotion regulation difficulty. In the current sample, for those with greater family resources it is more likely that one or more caregivers have full-time employment. This may increase the level of unavailability of the caregiver, which is proposed to already be a detrimental issue for this attachment group, and create a higher risk situation resulting in greater emotion regulation difficulties in middle childhood. It is possible that for these children, caregiver full-time employment decreases the likelihood of gaining positive caregiver-related resilience over time.

Ethnicity was also significantly associated with initial emotion regulation difficulties for those who displayed insecure-avoidant attachment such that African American children had less emotion regulation difficulties compared to Caucasian children. One aspect which is thought to produce insecure-avoidant attachment is intrusiveness (Ainsworth et al., 1978). Intrusiveness may provide over-stimulation for children, causing them to shut down, or become avoidant, in an adaptive effort to guard against the negative effects of over arousal. Ispa et al. (2004), utilizing the NICDH-SECCYD data found that across Caucasian, African American and Hispanic dyads, maternal intrusiveness predicted increases in child negative affective expression measured during mother-child play sequence 10 months later. For only African Americans, however, this relationship was moderated by parental warmth such that those African American mothers who displayed high intrusiveness, but also high warmth, had children whose negative affectivity increased less (Ispa, 2004). It is thought that intrusiveness or controlling parenting has a different meaning, is within a different context, or is lessened to the extent that it is normative in African American child development (Harwood et al., 2002; Ispa 2004, McLoyd & Smith, 2002; Spieker et al., 1999). In African American children it is possible that maternal warmth has a greater protective valence in the face of intrusiveness, producing less future difficulty with emotion regulation when compared to Caucasian counterparts.

Several aspects unique to African American families may also serve as protective or resilience factors in the face of insecure-avoidant attachment. For example, African American families often consist of multiple generations or

extended family living in one household (Kim & McKenry, 1998). It is possible that African American children experiencing avoidant attachment have a greater opportunity to form bonds with other family members who are sensitive and consistent responders. This is consistent with findings regarding African American family cultural norms in which multiple individuals, such as extended family, share in caregiving responsibilities for a child (McDermott, 2001). While reliance on an extended social network is related to poverty, economic instability, and female-headed households (Wilkinson, 1993), structural differences among ethnicities have been seen after controlling for these factors (Kim & McKenry, 1998). Such structural difference in African American families may also be a protective factor which results in less difficulty in emotion regulation compared to Caucasian youth.

Attachment type B. Within the rubric of several emotion theories, development of secure attachment is most adaptive and desirable (e.g., Bretherton, 1990; Stern, 1985; Tomkins 1962, 1963). Secure attachment is said to result from sensitive and consistent parenting (Ainsworth et al., 1978; Main & Solomon, 1986) and is thought to be associated with less learned attenuation or heightening of emotional reaction in an effort to secure parental attention and warmth, and thus a more favorable emotion regulation outcome when compared to other attachment groups (Braungart & Stifter, 1991; Cassidy, 1994; Nachmias et al., 1996). It was hypothesized that no antecedents would predict slope or intercept terms for this group of children. However, data indicate that ethnicity, temperament, and language skills predict initial levels of emotion regulation difficulty.

Again in this attachment group, children of African American descent evidenced less parent-reported emotion regulation difficulties when compared to Caucasian children. Across numerous parenting studies, child outcome is not associated with authoritative parenting (high levels of parental support and behavioral monitoring with lower levels of psychological control) in the same manner for Caucasian and African American children (e.g., Dornbusch et al., 1987; Steinberg et al., 1991). By dismantling dimensions of 'parenting styles', studies have found that nurturance and support provided by mothers (which are notably also major components of secure attachment in infancy) may be especially important in producing positive African American youth outcomes, such as academic achievement and high self-esteem (Bean et al., 2003; Gonzales, Cauce, & Mason, 1996; Mboya, 1995; Taylor, 2000; Taylor, Hinton, & Wilson, 1995). Interestingly, Bean et al., (2003) found that this same dimension of parental support was not predictive of self-esteem for Caucasian youth once family relationship aspects were included in analysis. A somewhat similar pattern among different ethnicities has emerged for maternal responsiveness; also a predictor of secure attachment. Whiteside-Mansell, Bradley, and McKelvey (2009) found that parental responsiveness was more protective against the development of internalizing problems for African American than European American children. Further driving home this point are those findings by Murry and Brody (1999) which indicate that parenting has greater effects on the development of self-regulation in rural, African American children ages 6 to 9, than child-centered or community factors. The current data are consistent with these findings, in that the sensitive responding and

safety of the secure attachment relationship appears to be especially beneficial for African American youth in the development of emotional regulation compared to Caucasian youth.

It is also possible that the African American youth in this attachment category experience less emotion regulation difficulty than their Caucasian counterparts because they evidence greater behavioral compliance. Greater use of control in parenting among low-income African American parents, as compared to middle-income Caucasian peers, has been attributed to parents' need to protect kids from neighborhood dangers and negative peer influences within an inner-city environment (Mason, Cauce, Gonzales, & Hiraga, 1996). The use of restrictive, controlling and authoritarian parenting has been associated with positive psychosocial outcomes among African American youth such as greater self-regulation (e.g., Baldwin et al., 1993; Baumrind, 1972; Lansford, et al., 2004). In fact, among African American mothers, attitudes toward one controlling tactic of parenting, physical punishment, is not associated with attitudes toward child-centered responsiveness (Kelley, Power, & Wimbush, 1992) or with maternal warmth (McGroder, 2000). Thus, the combination of controlling methods, often termed *no nonsense* parenting (Brody & Flor, 1998), is not mutually exclusive with high warmth and responsiveness in African American parenting styles. Therefore, those securely attached African American youth may experience optimal levels of these parenting factors which produce less emotion regulation difficulties, operationalized as greater behavioral compliance in some studies, when compared to Caucasian youth.

To fully understand the current data culture-bound socialization of emotion must also be considered. African American values are said to stress expressive individualism, or the ability to freely and spontaneously express the self, feelings, or beliefs in a variety of modes and intensities (Boykin & Toms, 1985). This is often in contrast with American society, based on European standards, which is said to stress restraint in emotional expression (Ward, 2000). Perhaps, within the context of the attachment relationship, a cultural context which values varying types and intensities of emotional expression contributes to better emotion regulation. Recently, the APA Task Force on Resilience and Strength in Black Children and Adolescents (2008) highlighted the importance of integrating parent-child relational factors and emotion regulation development in African American youth. The current data integrate these factors and indicate that cultural context likely plays an important role in positive emotion regulation outcome.

Those children who displayed secure attachment at 15 months were the only group for which temperament was predictive of initial emotion regulation status. Consistent with the parenting style of this attachment group, these children may be more able to be themselves, and not resort to over-modulation of innate levels of responsively during emotional reacting. This is consistent with findings that those displaying secure attachments evidence a wider range of emotions and do not systematically distort their responding (Braungart & Stifter, 1991; Cassidy, 1994; Nachmias et al., 1996). Thus, temperament may be associated with longitudinal emotion regulation levels because over time, those with secure attachment may not

have to work as hard to cover up their innate activity and response style in an effort to obtain consistent caregiving.

Temperament may also be predictive of initial, 3rd grade emotion regulation status of only securely attached children because these parents are more accurate in reporting on their child's behaviors and tendencies. This parenting style is characterized by consistency, warmth and responsiveness, as well as greater sensitivity to their child (Ainsworth et al., 1978; Belsky, Rovine, & Taylor, 1984; Egeland & Farber, 1984), which may produce more accurate reporting. The caregiver who is inconsistent and less sensitive to their child may have more difficulty picking up on their child's 'style' of temperament at an early age or 'style' of emotion regulation in middle childhood. A comparison of multiple raters on emotion regulation and temperament across attachment styles would be helpful in clarifying this association.

While several studies indicated stability in temperament across 2 -7 years (e.g., Rothbart, Derryberry, & Hershey, 2000; Moehler et al., 2008) longitudinal study of this construct produces typical stability correlations in the 0.2 to 0.5 range (e.g., Lemery, Goldsmith, Klinnert, & Mrazek, 1999; Pedlow, Sanson, Prior, & Oberklaid, 1993). Utilizing latent growth modeling, Partridge and Lerner (2007) found that difficult temperament development follows a curvilinear growth process and was discontinuous, but showed some predictable structure over time. They reported significant inter-individual change and it is difficult at this point to know how this inter-individual change in temperament growth over time reciprocally interacts with caregiver relationship style. It is possible that the nonsignificant findings regarding

differential attachment style effects are reflective of the instability of temperament while the secure attachment group's association with temperament reflects effects of a relative stable parenting style. Those providing stable and consistent caregiving may in some way reinforce or support the child's initial temperament style, increasing the stability of such an early reactive style. Adding repeated measures of temperament in future studies would likely help to clarify the dynamic associations between temperament, caregiver relationship and the development of emotion regulation.

A strong basis of literature also indicates that those with language difficulties are at risk for myriad adverse outcomes such as psychiatric disorder, self and emotional under- and over-regulation difficulties (e.g., Beitchman, Wilson, et al., 1996; Brinton & Fujiki, 1993; Cantwell & Baker, 1991; Carson, Klee, Perry et al., 1998). Language ability is associated with emotional knowledge and understanding as well as instrumental coping ability (Eisenberg, 2005; Kopp, 1982; Stansburry & Zimmerman, 1999). Because the child's language ability dynamically interacts with the caregiver relationship throughout childhood, it was hypothesized that greater language ability would be predictive of less emotion regulation difficulty in all non-securely attached groups. Interestingly, only those children who displayed secure attachment at 15 months demonstrated a significant negative association between language ability and emotion regulation difficulty.

Studies indicate that the manner in which the family environment reacts to emotion and expresses support affects children's emotion regulation (Davies & Cummings, 1998; Eisenberg, Fabes, & Murphy, 1996). It is possible that those

engaged in securely attached relationships are more likely to be taught verbally mediated instrumental coping strategies due to the nature of the responsive and sensitive parent. Perhaps those experiencing resistant, avoidant or disorganized attachments develop in environments in which verbal emotional expression is constricted and the child is not engaged in this learning process. This is consistent with findings which indicate insecure-avoidant infants communicate with their mothers directly only when feeling at ease and, overall, tend to display less positive emotions (Grossmann, Grossmann, & Schwan, 1986; Matas, Arend, & Sroufe, 1978; Pastor, 1981; Waters, Wippman, & Sroufe, 1979). The current data indicate that the context of the attachment relationship may be an important factor in the association of language and emotion regulation development which warrants further investigation.

It is also notable that language's association with emotion regulation is usually studied in high-risk and/or clinical populations (Catts, Fey, Zhang, Tomblin, 1999). Because those in clinical and high risk populations often also suffer from more global impairments, the association of language and regulatory behaviors is sometimes called into question (Lonigan et al., 1999). In a normally developing population, those with secure attachment style are usually the largest in size. Therefore, the current data indicate that for the majority of children, in a normally developing population, language ability is important in predicting emotion regulation difficulties at 3rd grade.

The current study also found that gender is predictive of growth such that males' emotion regulation difficulties decrease over time compared to girls' both in

the overall model and for those with secure attachment. This MLGC model finding informs the repeated measures ANOVA finding, in that this gender effect is likely the driving force behind the within subjects finding for overall change across time. The current findings of gender differences converge with data from non-clinical samples which indicate girls are often at greater risk for maladaptive emotional outcome when compared to boys. For instance, the effects of family conflict and support differ in impact depending on child gender, with girls appearing to be more sensitive to negative family emotional climate (Denham & Kochanoff, 2002). Additionally, as children move through middle childhood and into adolescence peer groups gain importance in affecting emotional adaptation (Erdley, Nangle, Newman, & Carpenter, 2001). Girls have been found to value friendship and endorse relational goals more highly than boys, resulting in stronger predictions of adjustment (Maccoby, 1990).

Attachment type C. Children who display insecure-resistant attachment are thought to display a heightened emotional reaction in what is thought of as an effort to illicit consistent parental responding (Cassidy, 1994). During the strange situation protocol, these children show fewer self-regulatory efforts upon caregiver reunion and some studies indicate that they develop a style of emotional under-regulation which leads to peer and academic difficulty (e.g., Calkins & Fox, 1992; Jacobson & Wille, 1986; Kochanska, 2001). The current study predicted that those who displayed insecure-resistant attachment at 15 months would evidence greater emotion regulation difficulty. In turn, we expected greater emotion regulation difficulty in this group to be associated with lower language ability or more difficult

temperament. These hypotheses were not supported. Furthermore, gender, ethnicity, and family resources were not predictive of initial levels of emotion regulation or change over time. The lack of findings for this group is surprising, as they are conceptualized as being at risk for the greatest under-regulation of emotion among attachment groups (Cassidy, 1994; Hofer, 1994). It is possible that within this middle to upper-middle class sample the additional resources of even those families evidencing insecure-resistant attachment buffer its maladaptive socio-emotional effects.

Attachment type D. Those children who evidence disorganized attachment are thought to display no coherent emotion regulation strategies (Main and Hesse, 1990). Because this type of attachment has been associated with deleterious child outcomes such as aggression and peer trouble as early as age 5 (Lyons-Ruth, 1996), it was hypothesized that those who displayed disorganized attachment at 15 months would evidence greater emotion regulation difficulty when confronted with lower language ability or more difficult temperament. However, the current study's hypotheses regarding disorganized attachment were not supported and no associations with ethnicity, family resources or gender were found. These findings are contradictory with previous studies that indicate disorganized attachment likely interferes with the development of emotion regulation (Barnett et al., 1999; Kochanska, 2001; Lyons-Ruth, 1996).

Instability in attachment patterns is thought to be associated with greater ecological risk and some studies have been successful at predicting stability and change of attachment patterns prospectively. For instance, ecological stressors

such as changes in family relationships, parental job loss, poverty, spousal separations, shifts in caregiver relationships, and the birth of a sibling have been found to predict shifts in the attachment relationship (Egeland & Farber, 1984; Teti et al., 1996; Thompson, et al., 1982; Vaughn, et al., 1979; Vondra, et al., 1999). Additionally, severe ecological risk, such as child maltreatment, predicts disorganized attachment at all ages and stability in classification between 18 to 24 months of age (Barnett, et al., 1999). The current study takes a snap shot of attachment at one point in time, 15 months, and does not address this issue of fluid but predictable changes in atypical attachment patterns. It is unclear if mercurial patterns were present in the current study which would have likely obfuscated the longitudinal association between the early dyadic relationship and emotion regulation difficulties.

Limitations

Although the current study utilized advanced statistical procedures in an effort to best illustrate development and resulted in a cohesive set of findings which build on previous research, it is important to note that several important limitations exist. As previously mentioned, aspects of the current study's measurement of emotion regulation may have hindered the ability to obtain a full range of variation. The measurement of emotion regulation may have been limited in scope and scores were not standardized based on normative data by age. This may have resulted in lower incidence of emotion regulation difficulty in the overall population as well as specific attachment groups. A distinct limitation exists in that this measure was also a parent report; future studies would likely benefit from multi-rater, experimental, or

structured observational approach. Additionally, findings indicate that emotion regulation may develop into a stable style before 3rd grade and thus the developmental window chosen, 3rd to 6th grade, was not adequate to measure growth in this construct. Furthermore, results indicate a need for multiple raters of emotion regulation and perhaps multiple domains of emotion regulation which are matched with age-appropriate developmental tasks, such as cognitive mediation. The current study utilized a large sample of normally developing children and descriptive data indicate a relatively middle to upper-middle class standing. While overall findings are fairly generalizable to this sector of the population, ethnic and gender specific results indicate the opportunity for further study in specific populations.

Conclusions and Future Directions

The current study contributes important findings to the understanding of emotion regulation development. A stable emotion regulation style may develop by 3rd grade, and thus differential growth trajectories associated with attachment style may be found prior to this time. Alternatively, it is possible that due to this stability, a lack of variance precluded a finding of differential growth patterns of emotion regulation associated with attachment style. Further investigation of the timing and nature of emotion regulation development is warranted.

The current study finds that the emotion regulation is differentially affected by temperament, language, ethnicity, and family resources depending upon the attachment context within which the child develops. Specifically, results speak to the resilience experienced by securely attached children who are fortunate enough to

experience good language skills and easy temperament. Because it is impressive that significant findings were observed in the association of attachment and emotion regulation across after several years of development, despite limited available variance, this study reinforces the importance of the continued consideration of early caregiver relationship factors and child-centered factors when investigating emotion regulation.

In addition to caregiver relationship and child-centered factors, ethnicity emerged as an important predictor of emotion regulation difficulty. Within the context of secure and insecure-avoidant attachment relationship, African American children emerged as having less emotion regulation difficulties. These findings are important because self-regulation has been deemed an especially important aspect for African American youth development (Kim, 2003), and it is highly associated with academic outcome (Howse, et al., 2003; Keane & Calkins, 2004). In turn, academic outcome has been identified as the most reliable route to breaking the cycle of poverty for minority populations (Price, 1995). Thus, the current data lend insight into the manner in caregiving context and cultural effects may put African American youth at 'promise', rather than at risk (Boykin, 2000). Of additional interest, ethnicity results were not analogous or consistent with family resource findings within the context of early attachment style; thus both constructs must be measured and considered in future investigation.

It is notable that significant variance was left over in both models. Thus, there remains an opportunity for discovering antecedents which affect emotion regulation development, overall and by attachment style. Several domains of influence on

child development were not within the current study's scope. A child exists in an environment of myriad reciprocally interacting forces which impinge on development. For example, reciprocal systems untapped in the current study which likely effect emotion regulation development include school interactions, neighborhood conditions and resources, and peer influences. For example, in a study of parenting with rural, African American families McBride Murray and colleagues (2008) found that across several years of measurement, neighborhood context, residing in a supportive community, or one that is unsafe and disorganized, was consistently associated with elevations in parental warmth and monitoring. Additionally, negative life events were associated with a decrease in parental warmth and monitoring. It is apparent that there continues to be a wealth of opportunity to study how these forces interact and influence the emergence of emotion regulation in the general population as well as specific high-risk youth.

During the period measured in the current study the peer group moves to the forefront in establishing normative behavior and influencing mental health outcome for youth. It is likely, however that peer relationships and influences reciprocally interact with child-centered and caregiver relationship factors. For instance, Chester, Jones, Zalot, and Sterrett (2007) found, in a study of 242, 7- to 15-year old African American youths residing in single mother homes, that in addition to main effects for positive parenting relationship and positive peer relationship quality accounting for youth depressive symptoms, a parent by peer relationship interaction was found. When mothers engaged in higher levels of positive parenting behavior, peer relationship quality was not associated with youth externalizing symptomatology.

However, when mothers engaged in lower levels of positive parenting behavior, higher peer relationship quality was associated with greater youth externalizing symptoms. Thus, caregiver relationship, child centered factors and peer relationships are likely dynamic forces which reciprocally interact with emotion regulation to influence child outcomes. Future studies may consider tapping into this important domain of development in an effort to more fully capture emotion regulation development.

The current study highlights resilience in a normally developing, non-high risk population. While high-risk is not simply the absence of resilience factors (American Psychological Association, Task Force on Resilience and Strength in Black Children and Adolescents, 2008), these data provide a picture of the differential effects of attachment, child-centered, and environmental factors in regards to emotional regulation difficulties. It will thus be important to utilize the current data to inform future studies investigating the manner in which child centered and early relationship factors affect the development of emotion regulation with those youth growing up in high risk environments.

Table 1

Descriptive Statistics by Overall Sample and Attachment Style

	Percent	Min.	Max.	Mean	S.D.	Variance
Overall Sample						
Male	52					
African American	12.9					
Fam. Resources		0.14	20.13	3.62	5.7	7.93
Temperament		1.54	4.72	3.18	0.40	0.16
Language				99.94	20.42	417.14
>130	2.0					
<70	7.7					
Type A						
Male	60					
African American	19.3					
Fam. Resources		0.14	11.63	2.98	2.11	4.47
Temperament		2.02	4.13	3.14	0.434	0.19
Language		50	130	93.33	22.36	499.99
>130	0.7					
<70	18.7					
Type B						
Male	49.5					
African American	10.9					
Fam. Resources		0.23	19.96	3.81	2.81	7.93
Temperament		1.54	4.58	3.17	0.4	0.16
Language		50	137	102.24	19.2	368.61
>130	2.3					
<70	5.8					
Type C						
Male	56.6					
African American	9.1					
Fam. Resources		0.14	11.63	2.98	2.11	4.47
Temperament		2.02	4.13	3.14	0.434	0.189
Language		50	130	93.33	22.36	499.99
>130	1.3					
<70	5.2					
Type D						
Male	44.2					
African American	16.4					
Fam. Resources		0.22	20.31	3.5	2.96	8.72
Temperament		2	4.04	3.18	0.36	0.14
Language		50	135	98.88	2.99	431.16
>130	3.0					
<70	7.9					

N = 1,273

Table 2

Bivariate Associations Among Antecedents

	Gender	Ethnicity	Fam. Resources	Temperament
Ethnicity	.061 [^]			
Fam. Resources	.062*	.273**		
Temperament	.026	-.189**	-.138**	
Language	.167**	.356**	.376**	-.137**

* $p < .05$ ** $p < .01$ *** $p < .001$ [^] = χ^2 phi statistic utilized

Table 3

Overall Model: Means, S.D. and Covariances for Emotion Regulation

	ER Grade 3	ER Grade 4	ER Grade 5	ER Grade 6
Mean	33.918	33.701	33.567	33.295
S.D.	5.585	5.450	5.660	5.703
Corr.	1.0			
	0.719	1.0		
	0.68	0.722	1.0	
	0.676	0.705	0.763	1.00

S.D. = Standard Deviation

Corr. = Correlation

Table 4

Summary of Missing Data Patterns

Missing Data Patterns (x = not missing)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
ERG3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x										
ERG4	x	x	x	x	x	x	x										x	x	x	x	x	x			
ERG5	x	x	x	x					x	x	x	x					x	x	x				x	x	
ERG6	x	x			x	x		x	x			x		x				x	x		x	x		x	x
Attach	x		x		x	x	x	x		x		x		x		x		x	x		x	x		x	x

Pattern	Frequency	Pattern	Frequency	Pattern	Frequency
1	881	10	6	19	2
2	39	11	1	20	1
3	22	12	6	21	4
4	1	13	2	22	8
5	20	14	15	23	1
6	3	15	3	24	6
7	7	16	30		
8	18	17	5		
9	2	18	7		

Proportion of Data Present - Covariance Coverage

	ERG3	ERG4	ERG5	ERG6	Attachment
ERG3	0.818				
ERG4	0.775	0.814			
ERG5	0.773	0.785	0.814		
ERG6	0.774	0.782	0.784	0.816	
Attachment	0.777	0.775	0.775	0.774	0.954

= emotion regulation, G = grade

ER

Table 5

Model Parameters for Overall and Multi-group Latent Growth Curve Models

	Overall Model		Multi-group Latent Growth Curve Model							
	U.C	S.E	Attachment Type A		Attachment Type B		Attachment Type C		Attachment Type D	
	U.C	S.E	U.C	S.E	U.C	S.E	U.C	S.E	U.C	S.E.
Mean intercept	29.944	1.723***	30.493	4.325***	29.476	2.351***	29.399	6.551***	33.820	3.884***
Gender	-0.282	0.334	-0.382	0.831	-0.412	0.499	-1.757	1.233	-0.272	0.791
Ethnicity	-1.701	0.547**	-2.125	1.077*	-2.574	0.756**	-0.442	2.321	0.073	1.149
Fam. Resource	0.063	0.065	0.510	0.244*	0.005	0.099	-0.102	0.242	0.235	0.175
Temperament	2.051	0.421***	1.840	1.109	2.841	0.546***	-0.057	1.598	0.912	1.178
Language	-0.024	0.010*	-0.030	0.021	-0.040	0.014**	0.057	0.040	-0.039	0.023
Mean slope	0.655	0.510	2.262	1.489	1.107	0.690	1.404	1.777	-1.545	1.241
Gender	-0.301	0.098**	-0.235	0.270	-0.274	0.137*	-0.305	0.320	-0.532	0.261
Ethnicity	0.112	0.161	-0.061	0.361	0.231	0.195	0.145	0.791	-0.118	0.375
Fam. Resource	-0.028	0.019	0.010	0.067	-0.037	0.029	-0.101	0.101	-0.017	0.039
Temperament	-0.085	0.124	-0.501	0.356	-0.193	0.184	-0.232	0.405	0.386	0.337
Language	-0.003	0.003	-0.011	0.007	-0.004	0.004	-0.002	0.012	0.003	0.008
Intercept variance	20.657	1.275***	16.213	2.494***	23.122	1.638***	20.004	3.482***	16.814	2.741***
Slope variance	0.625	0.149***	0.633	0.305*	0.635	0.188**	0.459	0.320***	0.639	0.275*
E.R.3 residual var.	9.035	0.768***	8.442	0.952***	8.442	0.952***	8.442	0.952***	8.442	0.952***
E.R.4 residual var.	8.674	0.530***	8.613	0.616***	8.613	0.616***	8.613	0.616***	8.613	0.616***
E.R.5 residual var.	8.420	0.522***	8.259	0.577***	8.259	0.577***	8.259	0.577***	8.259	0.577***
E.R.6 residual var.	6.849	0.698***	6.763	0.769***	6.763	0.769***	6.763	0.769***	6.763	0.769***

Note: Type A = insecure avoidant, Type B = secure, Type C = insecure resistant, and Type D = disorganized)
 U.C. = Unstandardized Coefficient
 S.E. = Standard Error
 E.R. = Emotion Regulation

*** $p < .000$ ** $p < .01$ * $p < .0$

Table 6

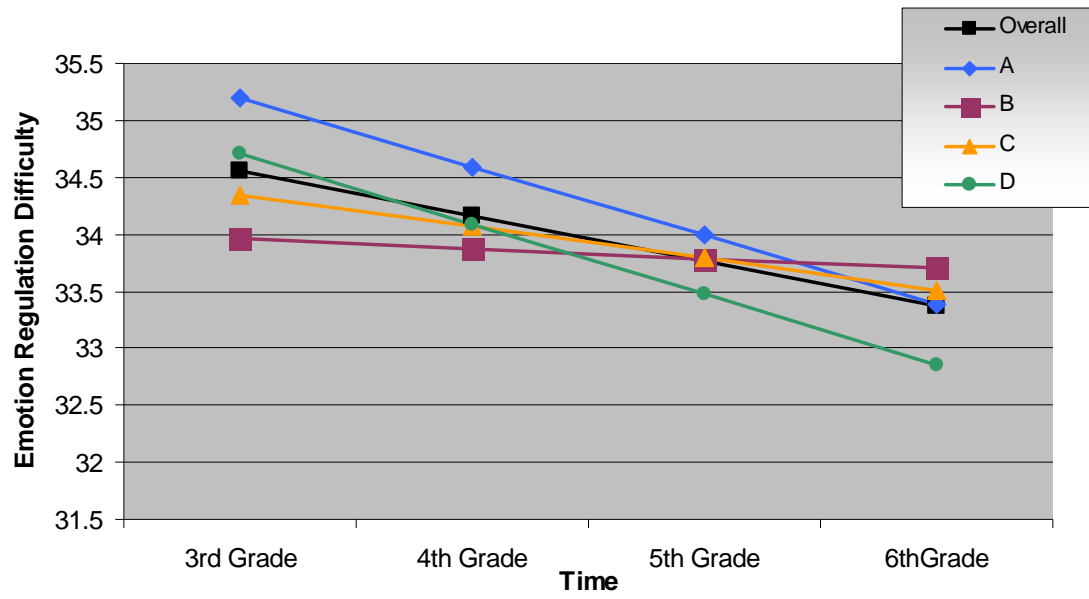
Partial Correlations among Parent Report of Child Reactions (P-RCR) and Internalizing, Externalizing, and Total Problems Scales of Child Behavior Checklist-Parent Version (CBCL)

		CBCL Internalizing	CBCL Externalizing	CBCL Total Problems
Grade 3	P-RCR	0.274***	0.439***	0.397***
Grade 4	P-RCR	0.288***	0.389***	0.384***
Grade 5	P-RCR	0.274***	0.455***	0.396***
Grade 6	P-RCR	0.264***	0.465***	0.410***

*** $p < .000$, ** $p < .01$, * $p < .0$

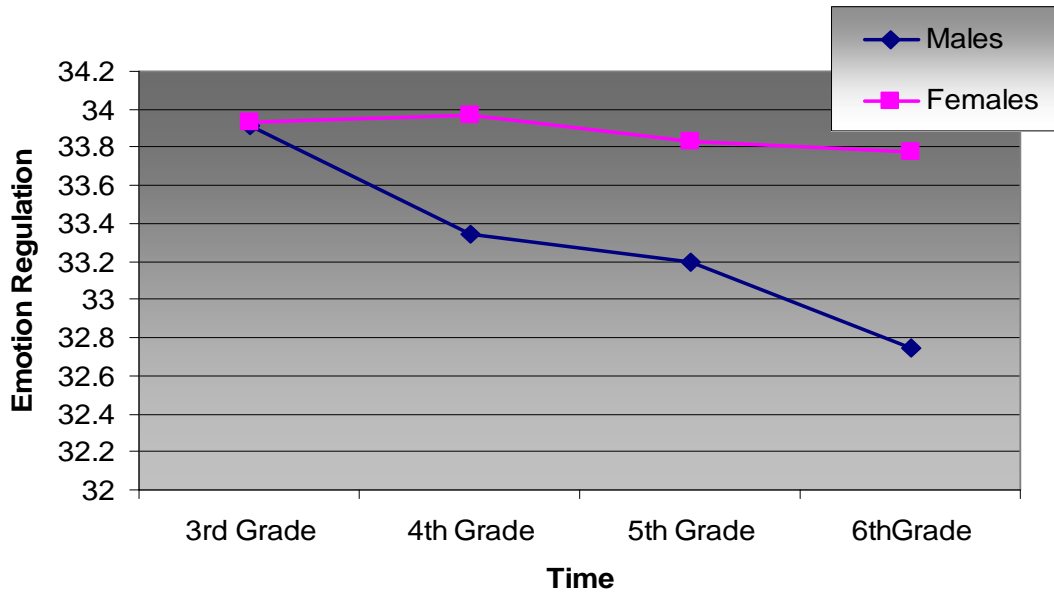
Graph 1

Growth Trajectories of Emotion Regulation



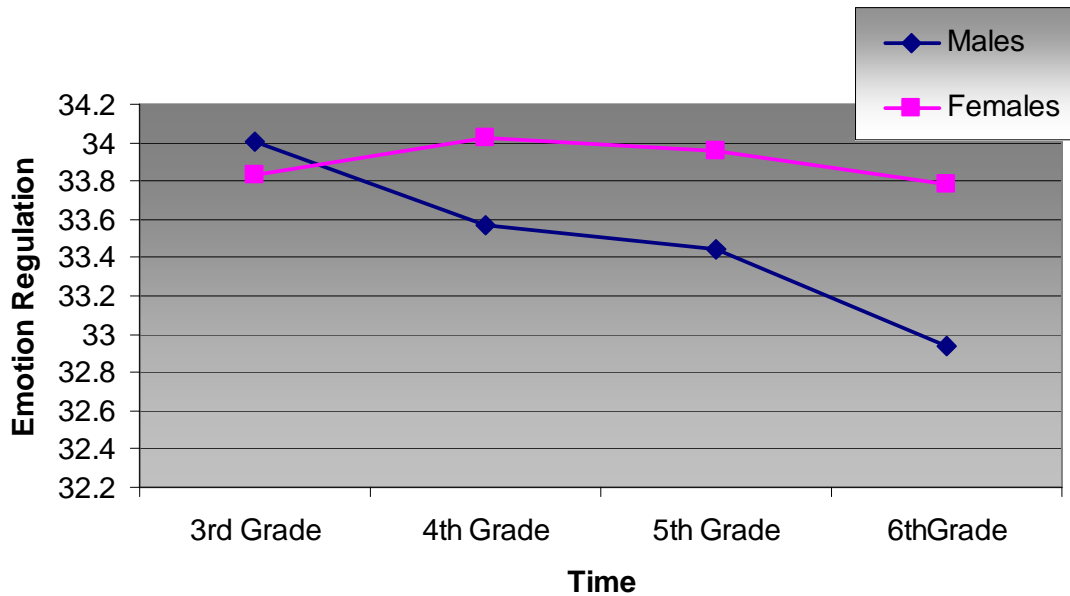
Graph 2

Emotion Regulation Growth Trajectories of Males and Females in Overall Sample



Graph 3

Emotion Regulation Growth Trajectories of Males versus Females in Secure Attachment Group



APPENDIX I



PARENT REPORT OF CHILDREN'S REACTIONS

Children differ in the ways that they respond to events and in their expression of emotion. Please indicate how your child reacts to events by circling the number above the scale shown below each statement. Please describe how your child reacts, not how you think a child should react or on how you think other children react.

Please think about when your child feels emotions, even if your child does not get emotional very often.

1. When my child feels an emotion, either positive or negative, my child feels it strongly.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

2. After finishing a difficult task, my child feels delighted or elated

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

3. My child responds very emotionally to stories, movies and events.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

4. My child is calm and not easily aroused.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

5. When angry, it is easy for my child to still be rational and not overreact.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

6. When happy, my child is contented and calm rather than exhilarated and excited.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

7. When my child experiences anxiety, the anxiety is normally very strong.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

8. Even when happy, sad, or upset, my child does not get highly emotional.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

9. When happy, my child is bursting with joy.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

10. My child is slow to become angry, nervous or upset.

1	2	3	4	5
Never	Occasionally	About Half the Time	Usually	Always

APPENDIX II

Strange Situation Description

The Strange Situation consists of eight episodes presented in a standard order for all subjects, with those expected to be least stressful occurring first. After a brief introductory episode, the baby was observed with his mother in the unfamiliar, but not otherwise threatening environment of the experimental room, to see how readily he would move farther away from her to explore a novel assembly of toys. While the mother was still present, a stranger entered and made a very gradual approach to the baby. Only after this did the mother leave, because it was anticipated that separation from her would constitute a greater stress than the presence of a stranger and/or of an unfamiliar environment per se. After a few minutes the mother returned and the stranger slipped out. The mother was instructed to interest her baby in the toys again, in the hope of restoring his exploratory behavior to the baseline level characteristic of when he was previously alone with his mother. Then followed a second separation, and this time the baby was left alone in the unfamiliar environment. As some check on whether any increased distress was a response to being alone rather than to having been separated a second time, and also to ascertain whether separation was more distressing than the presence of a stranger, the stranger returned before the mother finally returned.

APPENDIX III

THIS BABY

The purpose of these questions is to determine the general pattern of this baby's reactions to the world. For each question, please check the response indicating how often you think the statement is true for this baby. Although some of the statements seem to be similar, they are not the same, and we would appreciate your response to each question. If this baby has changed with respect to any of the questions, check the response that best describes the recently established pattern. If a question asks about a situation that this baby has not experienced, you may check CA, for "Can't Answer". There are no good, bad, right or wrong answers, only descriptions of what this baby does.

ID NUMBER							REL
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

USING THE SCALE SHOWN BELOW, PLEASE MARK AN " X " IN THE SPACE THAT TELLS HOW OFTEN THIS BABY'S BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED IN EACH STATEMENT.

IF THIS BABY HAS NOT EXPERIENCED A SITUATION, CHECK CA (for Can't Answer).

	Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always	Can't Answer	
	1	2	3	4	5	6	CA	
1. This baby accepts right away any change in place or position of feeding or person giving it.	Almost never	1	2	3	4	5	6	Almost always CA
2. This baby sits still while watching TV or other nearby activity.	Almost never	1	2	3	4	5	6	Almost always CA
3. This baby takes feedings quietly with mild expression of likes and dislikes.	Almost never	1	2	3	4	5	6	Almost always CA
4. This baby is fussy (frowns, cries) on waking up or going to sleep.	Almost never	1	2	3	4	5	6	Almost always CA
5. This baby vigorously resists additional food or milk when full (spits out, clamps mouth closed, bats at spoon, etc.)	Almost never	1	2	3	4	5	6	Almost always CA
6. This baby moves about much (kicks, grabs, squirms) during diapering and dressing.	Almost never	1	2	3	4	5	6	Almost always CA
7. This baby is shy (turns away or clings to me) on meeting another child for the first time.	Almost never	1	2	3	4	5	6	Almost always CA
8. This baby makes happy sounds (coos, smiles, laughs) when being diapered or dressed.	Almost never	1	2	3	4	5	6	Almost always CA
9. This baby resists changes in feeding schedule (1 hour or more) even after two tries.	Almost never	1	2	3	4	5	6	Almost always CA

	Almost never 1	Rarely 2	Usually does not 3	Usually does 4	Frequently 5	Almost always 6	Can't Answer CA		
10. This baby reacts mildly (just blinks or startles briefly) to bright light such as flash bulb or letting sunlight in by pulling up shade.					Almost never	1 2 3 4 5 6		Almost always	CA
11. This baby is pleasant (smiles, laughs) when first arriving in unfamiliar places (friend's house, store).					Almost never	1 2 3 4 5 6		Almost always	CA
12. This baby accepts new foods right away, swallowing them promptly.					Almost never	1 2 3 4 5 6		Almost always	CA
13. This baby accepts regular procedures (hair brushing, face washing, etc.) at any time without protest.					Almost never	1 2 3 4 5 6		Almost always	CA
14. This baby moves much (squirms, bounces, kicks) while lying awake in crib.					Almost never	1 2 3 4 5 6		Almost always	CA
15. This baby reacts strongly to foods, whether positively (smacks lips, laughs, squeals) or negatively (cries).					Almost never	1 2 3 4 5 6		Almost always	CA
16. This baby is pleasant (coos, smiles, etc.) during procedures like hair brushing or face washing.					Almost never	1 2 3 4 5 6		Almost always	CA
17. This baby plays actively with parents-much movement of arms, legs, body.					Almost never	1 2 3 4 5 6		Almost always	CA
18. This baby greets a new toy with a loud voice and much expression of feeling (whether positive or negative).					Almost never	1 2 3 4 5 6		Almost always	CA
19. This baby moves about much during feedings (squirms, kicks, grabs).					Almost never	1 2 3 4 5 6		Almost always	CA
20. This baby cries when left to play alone.					Almost never	1 2 3 4 5 6		Almost always	CA
21. This baby's initial reaction to a new babysitter is rejection (crying, clinging to mother, etc.)					Almost never	1 2 3 4 5 6		Almost always	CA
22. This baby adjusts within 10 min. to new surroundings (home, store, play area)					Almost never	1 2 3 4 5 6		Almost always	CA
23. This baby displays much feeling (vigorous laugh or cry) during diapering or dressing.					Almost never	1 2 3 4 5 6		Almost always	CA
24. This baby's first reaction to any new procedure (first haircut, new medicine, etc.) is objection.					Almost never	1 2 3 4 5 6		Almost always	CA

	Almost never 1	Rarely 2	Usually does not 3	Usually does 4	Frequently 5	Almost always 6	Can't Answer CA		
25. This baby is content (smiles, coos) during interruptions of milk or solid feeding.	Almost never	1	2	3	4	5	6	Almost always	CA
26. This baby adjusts easily and sleeps well within 1 or 2 days with changes of time or place.	Almost never	1	2	3	4	5	6	Almost always	CA
27. This baby shows much bodily movements (kicks, waves arms) when crying.	Almost never	1	2	3	4	5	6	Almost always	CA
28. For the first few minutes in a new place or situation (new store or home) this baby is fretful.	Almost never	1	2	3	4	5	6	Almost always	CA
29. This baby reacts strongly to strangers: laughing or crying.	Almost never	1	2	3	4	5	6	Almost always	CA
30. This baby continues to react to a loud noise (hammering, barking dog, etc.) heard several times in the same day.	Almost never	1	2	3	4	5	6	Almost always	CA
31. This baby actively grasps or touches objects within his/her reach (hair, spoon, glasses, etc.).	Almost never	1	2	3	4	5	6	Almost always	CA
32. This baby is still wary or frightened of strangers after 15 minutes.	Almost never	1	2	3	4	5	6	Almost always	CA
33. This baby reacts mildly (quiet smiles or no response) to meeting familiar people.	Almost never	1	2	3	4	5	6	Almost always	CA
34. This baby lies still and moves little while playing with toys.	Almost never	1	2	3	4	5	6	Almost always	CA
35. This baby is fussy or moody throughout a cold or an intestinal virus.	Almost never	1	2	3	4	5	6	Almost always	CA
36. This baby requires introduction of a new food on 3 or more occasions before he/she will accept (swallow) it.	Almost never	1	2	3	4	5	6	Almost always	CA
37. This baby plays quietly and calmly (little vocalization or other noise) with toys.	Almost never	1	2	3	4	5	6	Almost always	CA
38. This baby remains pleasant or calm with minor injuries (bumps, pinches).	Almost never	1	2	3	4	5	6	Almost always	CA
39. This baby moves much (kicking, waving arms and bouncing) and for several minutes or more when playing by self.	Almost never	1	2	3	4	5	6	Almost always	CA

	Almost never 1	Rarely 2	Usually does not 3	Usually does 4	Frequently 5	Almost always 6	Can't Answer CA	
40. This baby's initial reaction is withdrawal (turns head, spits out) when consistency, flavor, or temperature of solid foods is changed.					Almost never	1 2 3 4 5 6		Almost CA always
41. This baby accepts changes in solid food feedings (type, amount, timing) within 1 or 2 tries.					Almost never	1 2 3 4 5 6		Almost CA always
42. This baby appears bothered (cries, squirms) when first put down in a different sleeping place.					Almost never	1 2 3 4 5 6		Almost CA always

This baby's temperament (style of behaving) is:

- a about average
- b more difficult than average
- c easier than average

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ABSTRACT**TRAJECTORIES OF EMOTION REGULATION IN MIDDLE CHILDHOOD: AN INVESTIGATION OF ATTACHMENT, TEMPERAMENT, AND LANGUAGE**

by

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The development of emotion regulation continues to be considered a cornerstone to adaptive child development. However, studies have yet to integrate early relationship, child-centered factors, and socio-demographic factors, from infancy through middle childhood, in an attempt to look at emotional regulation development over time. By utilizing latent growth curve modeling, the current study aimed to extend understanding of how child-centered factors (temperament and language skill) and socio-demographic factors (gender, ethnicity, and family resources) affect the development of emotion regulation from 3rd to 6th grades, within the context of early attachment relationships. Stability in emotion regulation in the general sample, as well as in each attachment style was observed. While no differences among initial levels of emotion regulation or developmental trajectories was found among attachment styles, differential effects were found for child-centered factors and socio-environmental factors. For those evidencing secure and insecure-avoidant attachment, African American children had less emotion regulation difficulty compared to Caucasian children. Additionally, for those securely

attached, difficult temperament was positively associated with emotion regulation difficulty while language skill was negatively associated. Finally, for those with secure attachment, gender was predictive of slope, such that boys emotion regulation difficulties decrease over time compared to girls. Findings suggest potential resilience factors for the general population as well as high-risk youth and highlight the continued importance of considering attachment and child-centered variables, as well as socio-demographic factors when studying emotion regulation.

AUTOBIOGRAPHICAL STATEMENT

Julie E. Braciszewski was raised in metro Detroit where disparities in mental health services are wide-spread and affect many youth. These experiences shaped her desire to understand development in high-risk populations and work to lessen such discrepancies of service provision in the urban milieu. After obtaining her undergraduate degree at the University of Michigan in 2003 she went on to work for the Center for Community Research at DePaul University and then attended the clinical psychology program at Wayne State University from which she earned her master's degree in 2007. Hoping to take advantage of unique training opportunities within the urban environment, Ms. Braciszewski has worked on several research projects with the Child and Family Study Group, headed by Dr. Douglass Barnett. Ms. Braciszewski investigates language, reading, and behavioral associations with urban youth, attachment, parent-child dyadic relations with high-risk children, and the development of emotion regulation. When possible Ms. Braciszewski integrates screenings and parent/teacher collaboration with research so that traditionally underserved populations may benefit from long-term result dissemination and social policy change as well as immediate mental health services. In August, 2010, after finishing internship at the Hawthorn Center, an inpatient psychiatric hospital for children and adolescents, Ms. Braciszewski will obtain her Ph.D. in clinical psychology. Ms. Braciszewski will then complete a postdoctoral fellowship in early childhood and adolescence at The Alpert Medical School of Brown University in Rhode Island.