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**ALL IN THE FAMILY: THE ROLE OF SIBLINGS AS SURROGATE  
ATTACHMENT FIGURES**

by

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**SUBMITTED TO SCRIPPS COLLEGE IN PARTIAL FULFILLMENT  
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**PROFESSOR WOOD  
PROFESSOR WALKER**

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### Abstract

While several studies have analyzed the impact of mother-child attachment security on the child's emotion regulation abilities, few studies have proposed interventions to help children improve emotion regulation abilities in the presence of an insecure mother-child attachment. This current study extends previous findings about the influence of mother-child attachment on the child's emotion regulation abilities and contributes new research in determining whether an older sibling can moderate this effect. This study predicts that across points of assessments: 18 months, 5 years, 10 years, and 15 years, the quality of mother-child attachment security will influence the child's performance on an emotion regulation task, such that securely attached children will demonstrate the most persistence and least distress, children with Anxious-Avoidant attachment will demonstrate the least persistence, and children with Anxious-Ambivalent will demonstrate the most distress. If, at any point, the child develops an insecure relationship with the mother and a secure relationship with the older sibling, the child's persistence is expected to increase and the child's distress is expected to decrease. In this way, the older sibling will serve as a surrogate attachment figure. These research findings have important implications for parenting behaviors as well as clinical practices.

*Keywords: Attachment theory, Emotion regulation, Sibling relationships, Child development*

### **Introduction**

Consider Serena, a girl who received consistent caregiving from her mother and support from an extensive support network. When asked the question, “What happens if you had an argument with your friend; could that make your friendship end”, she thought for a moment and responded, “No, really you would probably be better friends afterwards, because you would understand each other better.” Serena’s response matched her behavior as she demonstrated confidence and resilience when tackling situations which may provoke emotional distress. As a stark contrast, Thomas is a boy whose mother was emotionally unavailable due to her depressive disorder and whose father figures were continually introduced but inconsistent and unreliable. Thomas, unlike Serena, did not seek his mother for care and comfort. Throughout his childhood, he struggled with peer competency, seeming isolated and withdrawn, and developed maladaptive emotion regulation abilities, as he acted out in aggressive behaviors at home and in the classroom.

Serena and Thomas, two participants in Sroufe et al., (2005b)’s “The Development of the Person: Minnesota Study” demonstrate the importance of attachment and its influence on emotion regulation abilities. Thomas’ trajectory is not an anomaly. Across recent empirical studies, the percentage of insecure caregiver-child relationships ranged from 5% to 31% (Zimmer-Gembeck et al., 2017). Because Sroufe et al.’s., (2005b) longitudinal study yielded significant findings, and because Zimmer-Gembeck et al.’s (2017) meta-analysis, exploring the influence of mother-child attachment on the child’s

emotion regulation abilities, was published this year, it seems especially pertinent to explore this interaction longitudinally.

A longitudinal study also may shed light on potentially broader support networks which may explain the differences in Serena and Thomas' trajectories because there are more subsidiary attachment figures who can support the mother and child. To date, no studies have explored whether or not an older sibling can serve as a surrogate attachment figure throughout childhood. Older siblings, in particular, seem an important potential relationship because they endure the same parenting structures and remain a permanent member of the family as opposed to peer friendships which may be voluntary and temporary. The current study seeks to understand the intersection between mother-child attachment security and emotion regulation abilities from infancy to adolescence and to determine whether secure sibling relationships have a unique role in changing the course of a child's trajectory by serving as a buffer against maladaptive emotion regulation abilities.

**Attachment Theory.** Mother-child attachment is ubiquitous even though the importance of this bond was, at one time, contentious. In his study with infant rhesus monkeys, Harlow (1958) refutes Freud's argument that attachment is merely developed for food and survival, and instead posits that infants need "contact-comfort" for their emotional and psychological well-being. Bowlby (1969) believes that human children, too, have an inherent motivation to achieve proximity with their mothers, and their attempts to either seek or resist this proximity will indicate the extent to which the child perceives a supportive relationship and feels secure in the relational bond. Harlow (1958) also

observed that the monkeys who experienced “contact-comfort” with the cloth-surrogate were more inclined to approach and explore a frightening stimulus, whereas the monkeys who did not have a comforting surrogate present cowered in fear and attempted to self-soothe. The monkeys who experienced “contact-comfort” likely developed a secure attachment with the surrogate, because secure attachment is marked by the child’s skillful balance between exploring novel stimuli and returning to his/her mother as a secure-base (Bowlby, 1969). In this way, children who feel securely attached to their mothers may develop adaptive emotion regulation abilities whereby they could exercise independence but return to their mothers knowing they will receive care in the face of fear, pain, or danger. As a contrast, children who feel insecurely attached to their mothers may develop maladaptive or insufficient emotion regulation abilities because they must rely on themselves for care, despite being ill-equipped to do so (Bowlby, 1969; Harlow, 1958).

Ainsworth and her colleagues (1978), empirically tested Bowlby’s (1969) theories in her creation of the Strange Situation Procedure (SSP), and her assessment led to three distinct categories of attachment: Secure Attachment, Anxious-Avoidant, and Anxious-Ambivalent. The “Securely Attached” infants exhibited distress upon separation from their mothers, but then greeted their mothers with gladness and relief, expressing a desire to be held and comforted. These infants were more likely to interact with the stranger and explore the environment. The next group of infants were labeled “Anxious-Avoidant” because they demonstrated independence when the mothers separated and exhibited little to no affective or behavioral change when the mothers returned. Some of those infants even avoided their mothers. The “Anxious-Ambivalent” group protested separation from

their mothers through clingy behaviors and then expressed seemingly inconsolable behaviors after the mothers returned, displaying a resistance to be soothed. The infants who were labeled “Anxious-Avoidant” or “Anxious-Ambivalent” did not engage with the stranger nor did they explore the environment, and as a result, were labeled insecurely attached (Ainsworth et al., 1978). Years later, Main and Solomon (1990) developed a fourth category of attachment: “Disorganization”. Children categorized as “Disorganized” exhibit contradictory behaviors, filled with confusion and apprehension; this attachment classification is more rare and almost exclusively occurs in severe cases of physical abuse or neglect. Thus, the infant’s behaviors reveal their perceptions of their mothers and by extension the mother-child attachment security.

**Emotion Regulation.** As a construct, emotion regulation is difficult to analyze because what may seem maladaptive, like loud vocalization or aggressive behaviors, may produce the child’s desired effect, like getting a toy. It is also difficult to measure observationally because it includes both extrinsic and intrinsic processes (Thompson, 1994). Further, the definitions for emotion regulation change depending on the age of the child. In toddlerhood, emotion regulation is defined by the toddlers’ use of arousal and affect (NICHD Early Child Care Research Network, 2004). In middle-childhood, the definition places more concern on the behavioral strategies used to modify or limit the intensity of arousal and affect (Cole, Martin & Dennis, 2004). In adolescence, emotion regulation is contextualized in social relationships and viewed more in terms of decisions and behavioral outcomes (Zeman, Cassano, Perry-Parrish & Stegall, 2006). In order to provide a consistent measure of emotion regulation from infancy to adolescence, this

current study operationalizes emotion regulation as the individual's duration of persistence and intensity of distress during a problem-solving task, designed to elicit frustration. Persistence and distress are variables of interest specifically because they are two observable measures highly correlated to attachment classifications (Braungart & Stifter, 1991; Jacobsen, Edelstein & Hofmann, 1994; Kelley & Jennings, 2003; Matas, Arend & Sroufe, 1978; Moss & St-Laurent, 2001; Zimmer-Gembeck et al., 2017).

According to Ainsworth (1979), a mother's sensitivity to the child's needs and her ability to address them appropriately largely determines the child's quality of attachment towards his/her mother; Tronick and his colleagues (1978) posit that a mother's sensitivity may also determine the effectiveness of her child's developing emotion regulation competencies. In "The Still-Face Paradigm", Tronick et al., (1978) instructed mothers to either playfully interact with their 2-20 week old infants or remain still-faced. In a matter of seconds, the mother's still-face caused the infant's affect to change. The infant made attempts to regain the mother's attention through pointing and vocalization. When that proved futile, the infants usually shrieked loudly, collapsed in their postures, or even turned away from their mothers to signify their attempts to withdraw from the interaction (Tronick et al., 1978). Thus, the mother's responsiveness towards the child, and the child's emotions, largely affects the bond between them.

Tronick and his colleagues (1978) also posit that the child's emotion competencies are largely developed in the mother-child context due to a phenomenon they labeled as "mutual regulation" (p.11). Mutual regulation is the process whereby even without formalized language, both the mother and the infant use affect to communicate



and modify their reactions based on the feedback from the other (Tronick et al., 1978). However, the mother's physical presence is insufficient for the child to foster a secure attachment and effective emotion regulation abilities. In Sorce and Emde's (1981) study, the children whose mothers actively interacted with them displayed more exploratory behaviors, an indication of secure attachment, as compared with the children whose mothers read a newspaper beside them. Thus, the mother's ability to be emotionally attuned to her child's needs fosters secure attachment. This familial emotion socialization is integral to the child's attachment and emotion regulation abilities even in middle childhood. When 24 families discussed a shared negative experience, preadolescent children whose parents worked collaboratively with the child to acknowledge both positive and negative facets, reported higher levels of self-competency and self-confidence two years later. As a contrast, children whose families dwelled on negative facets or ignored them entirely, rated themselves as lower in self-competency and self-confidence two years later (Marin et al., 2008). Because self-confidence is linked to child's attachment security and perceived competency impact the child's emotional responses to frustrating task, the mother's ability to help her child articulate and regulate her child's emotional responses serves as incredible importance to the child's future development (Jacobsen, Edelstein & Hofmann, 1994; Marin et al., 2008; Moss & St-Laurent, 2001; Waters et al., 2010). Although the child's emotional competencies may be developed in the mother-infant context, it is still impacted throughout childhood.

**Attachment from Infancy to Adolescence.** Attachment security is not just important for emotion socialization in the mother-child context, but has profound influences on notions

of the self and others throughout the lifespan. Bowlby (1973) theorized that an Internal Working Model (IWM), shaped by the child's early experiences with his/her primary caregiver, informs the child's perceptions and expectations of behaviors in future relationships. Security in the mother-child context predicts the child's experience with teachers, coaches, and other adults, as securely attached children demonstrated more compliance with the requests of authority figures, whereas insecurely attached children demonstrated more defiance with those requests (NICHD Early Child Care Research Network, 2004; Stifter, Spinrad & Braungart-Rieker, 1999). In middle-childhood and adolescence, attachment classifications affect the quality of bond between the child and the teacher, the teacher's perception of the child, and, likely, the child's perception of schooling at large (Aikins, Howes & Hamilton, 2009; Sroufe, 2005a). Attachment classifications also impact friendships and romantic relationships, as securely attached children develop more trusting and intimate relationships that are reciprocal in nature, while insecurely attached children may report more loneliness and isolation, likely due to the increased reporting of trust issues (Kobak & Sceery, 1988; Sroufe et al., 2005b).

Attachment classifications also seem to predict how children modulate or regulate their distress. Researchers Braungart and Stifter (1991) observed infants' distress in their replication of the SSP (Ainsworth et al., 1978) and found that infants classified as Anxious-Avoidant had more difficulty modulating distress when the mother temporarily left the room, whereas infants classified as Anxious-Ambivalent had more difficulty modulating distress and being soothed when the mother returned to the room. Cassidy (1994) expanded on their research and theorized that while securely attached children are

more likely to modulate their distress adaptively, children with an Anxious-Avoidant attachment will most likely suppress their distress, while children with an Anxious-Ambivalent attachment will most likely heighten their distress. Similar to Bowlby's IWM theory (1973), Cassidy's (1994) paradigm holds that insecure attachment classifications manifest in maladaptive emotion regulation abilities because parents either overemphasize or underemphasize certain negative emotions. As a further parallel, Bowlby's IWM theory (1973) predicts attachment stability throughout the lifespan, and Cassidy (1994) also believes these emotion regulation abilities will remain relatively stable throughout the lifespan.

However, although mother-child attachment influences the child's attachments in future relationships and is widely-assumed to remain fairly stable across the lifespan, few studies have actually conducted a longitudinal study from infancy to adolescence to test this assumption (Aikins et al., 2009; Sroufe et al., 2005b). Mother's attachment classification strongly predicts the child's attachment classification in infancy (Murray, Fiori-Cowley, Hooper & Cooper, 1996; Shah, Fonagy & Strathearn, 2010); however, when the child's attachment is examined across the lifespan, it is believed to remain only moderately stable. When administering the SSP in infancy, Aikins, Howes, and Hamilton (2009) labeled 62% of participants as securely attached, but when they administered the Adult Attachment Projective (AAP) in adolescence fifteen years later, they found that only 29.78% of those participants remained securely attached in adolescence. This high rate of discontinuity can be misleading because the researchers examined a fourth, highly variable, attachment classification and because there is no gold standard for assessing

attachment in middle childhood and adolescence. In infancy and early childhood, there is a higher rate of continuity, 86%, because Ainsworth et al.,'s (1978) SSP and Main and Cassidy's (1988) modified SSP is highly correlated. Even still, mother-child attachment is believed to consistently predict emotion regulation abilities throughout the lifespan and a longitudinal design accounts for unforeseen environmental stressors which may impact those classifications.

Toddlers, like infants, still rely on their caregivers to guide their self-regulation (Sroufe et al., 2005b). Thus, if a caregiver is incompetent at regulating his/her own emotions, or if there is a disruption within the caregiver-child bond, the child's developing emotion regulation capacities may suffer. While children with insecure attachment display high levels of distress and aggressive or impulsive behaviors to voice their discontent, children with secure attachment modulate their distress more effectively because they perceive that their caregiver will respond appropriately (Calkins & Johnson, 1998; NICHD Early Child Care Research Network, 2004; Matas et al., 1978; Trolnick et al., 1978). Even when the child is not actively engaged with the mother but is working independently on a task, children with an insecure attachment are more likely to demonstrate less persistence and give up preemptively, whereas children with a secure attachment work more consistently, persistently, and enthusiastically (Kelley & Jennings, 2003; Matas et al., 1978). Thus, the mother-child bond is crucial to the emotional regulation abilities developed in toddlerhood, namely distress and persistence.

Although children are not as dependent on their mothers for co-regulation in early childhood, they may still place great importance on the mother-child relationship which

may influence their emotion regulation abilities. When 49 six-year-olds heard stories evoking anger in the main character and were asked how the main character should respond to regulate his/her anger, the securely attached six-year-olds were more concerned about preserving a relational bond and were, therefore, more likely to endorse problem-solving in social engagement (Waters & Thompson, 2016). On the contrary, maladaptive emotion regulation abilities, namely aggressive behaviors, were more common among insecurely attached six-year-olds because they seemed less concerned about disrupting a relational bond (Waters & Thompson, 2016). When Moss and St-Laurent (2001) measured attachment security in 108 mother-child dyads at age six and later assessed the child's academic achievement and cognitive engagement at age eight, they found that children with insecure attachments have lower levels of cognitive engagement, with the lowest scores on mastery motivation (Moss & St-Laurent, 2001). Because securely attached children are more inclined to explore unfamiliar environments and novel stimuli, they may have more opportunities to take risks, learn from mistakes, and work persistently and resiliently which may impact classroom behavior and learning outcomes. Thus, the quality of mother-child attachment not only affects the child's adjustment to kindergarten and first grade (NICHD Early Child Care Research Network, 2004), but also within the classroom during school-aged years (Moss & St. Laurent, 2001).

Although children are self-regulating in preadolescence, attachment theory postulates that the mother's emotion regulation abilities are still integral to the child's development because these abilities are internalized and then manifested in other settings,

even in the absence of the mother (Cassidy, 1994). Jacobsen et al.,'s (1994) research confirms that even without the presence of a mother to help them regulate, securely attached children can modulate frustration advantageously and work persistently on cognitive-based problems, whereas insecurely attached children are disadvantaged on most exploration-based cognitive problems. Taken together, Cassidy's theory (1994) and Jacobsen et al.'s (1994) findings may indicate that insecurely attached children do not view themselves as competent enough to achieve, and may not be motivated enough to engage. Securely attached children, on the other hand, are more likely to engage in exploratory behaviors, which thereby cultivates their autonomy and improves their self-confidence, as evident by their high self-esteem levels both in direct observation and self-reports (Jacobsen et al., 1994; Marin et al., 2008; Sroufe, 2005b). Thus, the quality of mother-child attachment may pertain to the child's views of him/herself as capable which affects emotion regulation abilities, as manifested by constructive engagement.

Even still, in middle childhood and adolescence, the relation between mother-child attachment and the child's emotion regulation abilities are more indirect and the effect sizes are smaller (Zimmer-Gembeck et al., 2017). Most studies focus on the influence of peer attachment on psychosocial outcomes (Contreras et al., 2000; Seibert & Kerns, 2009; Sroufe, 2005a). Mother-child attachment does not directly predict behavioral outcomes, such as school attendance, risky sexual behaviors, and substance use, unless it is broadened to the quality of care the preadolescent or adolescent receives at home (Sroufe et al., 2005b). Further, mother-child attachment does not predict IQ, school performance, or GPA, but does predict psychosocial adjustment in elementary

school which is the strongest correlate to high school failure (NICHD Early Child Care Research Network, 2004; Sroufe, 2005a). Although mother-child attachment has only indirect links on psychosocial outcomes in middle-childhood and adolescence, the importance of this developmental trajectory calls for more research in this area.

Even in preadolescence and adolescence, secure attachment is marked by the child/teenager's belief that he/she is worthy of his/her parent's love and that the parent will be available in times of need (Hershenberg et al., 2011). Much like young securely attached children who strike a balance between exploring the environment and returning to their mother, secure preadolescents and adolescents strike a balance between asserting his/her perspective and acknowledging the parent's point of view in their attempts to gain autonomy from their parents (Hershenberg et al., 2011; Kobak et al., 1993; Kobak & Sceery, 1988). These securely attached children and teens are more emotionally regulated, not because they cannot experience negative emotions like anger or sadness, but because securely attached children engage in more direct, honest, and open communication with the mother in those times (Easterbrooks, Biesecker, Lyons-Ruth, 2000; Waters et al., 2010). The preadolescents' and adolescents' perceptions of their parents' receptiveness leads to greater perceived self-competence and self-confidence (Marin et al., 2008). Adolescents, who are less successful in this balance, likely because of an insecure attachment, demonstrate more dysfunctional anger while the mothers demonstrate more dominance in their attempts to control the conversations (Kobak et al., 1993). Although the influence of mother-child attachment on child's psychosocial

outcomes may be indirect in preadolescence and adolescence, the theory behind secure and insecure attachment remains the same in these contexts.

**Sibling Relationships.** It is well-known that toddlers, children, and adolescents who are insecurely attached to their mother demonstrate a decreased quality in their peer relationships, have difficulty interacting with peers, and are more likely to report feelings of loneliness and isolation (Brumariu & Kerns, 2013; Kobak & Sceery, 1988; Sroufe, 2005a; Sroufe, 2005b.), while those with secure attachments to their mother have more trusting and close relationships (Brumariu & Kerns, 2013; Contreras et al., 2000; Kerns, Klepac & Cole, 1996; Kobak & Sceery, 1988; Kobak et al., 1993; Sroufe, 2005a; Sroufe, 2005b). Bowlby (1973) theorized the role of secondary attachment figures who, in the place of a secure parent-child relationship, may have a protective effect on the child's psychosocial adjustment. Siblings, in particular, share a unique bond which can serve of importance in the familial context and in the child's later development. While the parent-child context involves protection and support, sibling relationships offer playful interactions and fulfill the social needs of the child. Therefore, the child's potential frustration towards his/her mother for insufficient caregiving may not directly transfer to sibling relationships. Additionally, Carr and Wilder (2016) assert that individuals classified as Anxious-Avoidant perceive significantly more risk in seeking support from their friends as opposed to their siblings. Carr and Wilder (2016) suggest this is because peer friendships are voluntary and temporary, whereas sibling relationships are foundational and durable.



Milevsky (2005) suggests that in the case of an insecure mother-child dyad, individuals who receive support from siblings report lower depression and loneliness and also report higher levels of self-esteem. In this way, a secure sibling relationship, which is part of the familial context but is still a peer in terms of age and development, can serve as a surrogate attachment figure and can lead to psychosocial outcomes which are similar to secure mother-child dyads. The link between insecure mother-child attachment and poor peer competency can be explained by a difference in emotional awareness whereby insecurely attached children have more difficulty labeling and communicating their feelings to another, which may exacerbate feelings of anxiety and loneliness (Brumariu, Kerns & Seibert, 2012; Contreras et al., 2000). However, if insecurely attached children have a sibling who understands their feelings without having to articulate them first simply because they experience the parenting structure together, the sibling relationship may be serve as a protective factor against feelings of anxiety, loneliness, and depression.

Researchers Gass, Jenkins & Dunn (2007) tested this theory to determine if sibling relationships could serve as an intervention to counter internalizing symptoms, which may result from insecure mother-child attachment. In their study with 192 families, Gass, Jenkins & Dunn (2007) determined that the interaction between stressful life events and warm sibling relationships did significantly predict a decrease in the child's internalized symptomatology after two years. Providing further evidence that siblings may serve as a surrogate attachment figure, Seibert & Kerns (2009) found that 5-11% of 7-12 year old children approached a sibling for attachment needs, like feelings of sadness or fear, despite having an available caregiver. Thus, peer relationships, and

especially sibling relationships, may serve as attachment figures for children especially in preadolescence and adolescence when the child begins to move away from the primary caregiver and, consequentially, the link between mother-child attachment and psychosocial outcomes becomes more indirect.

Studies have largely overlooked sibling relationships because of a perceived “spill-over effect” whereby insecure mother-child attachment inevitably influence sibling relationships. By this logic, the siblings will share the same attachment classification to their mother (Fortuna et al., 2011). In one sample, 62% of 138 sibling pairs did share the same attachment classification, either secure or insecure, to their mother (van Ijzendoorn et al., 2000). However, once the researchers analyzed three different attachment classifications: Secure, Anxious-Ambivalent, and Anxious-Avoidant the concordance rate was minimal and insignificant (van Ijzendoorn et al., 2000). Therefore, even if both siblings developed insecure attachments to their mother, they likely will not share the same classification of insecure attachment and thus may offer support to one another in various capacities. Further, Bowlby’s (1973) IWM is described as a “working” model which underscores its flexible and adaptable nature, especially during childhood (Bowlby, 1973). Therefore, children’s conceptions of attachment to a caregiver can be modified by a supportive sibling relationship, even if that sibling, too, develops an insecure mother-child bond.

The few published studies involving sibling attachment in relation to mother-child attachment suggest that sibling relationships may serve as a protective factor against emotion dysregulation and other maladaptive outcomes (Gass et al., 2007; Stewart, 1983;

Volling, 2001). When replicating the SSP (Ainsworth et al., 1978) to include sibling relationships, Stewart (1983) found that more than half of all older siblings actively cared for their younger siblings and these attempts to comfort were accepted by the younger siblings and effective in reducing distress. In this way, older siblings can successfully become a “subsidiary attachment figure” when the mother is not present (Stewart, 1983; p. 198). However, sibling relationships can be limited because the other 40% of older siblings who ignored their younger sibling’s distress were likely experiencing personal distress themselves (Stewart, 1983; Volling, 2001). Even still, sibling relationships are an important avenue to explore because when there is marital or parental conflict, children often turn to their siblings (Jenkins & Smith, 1990). More directly, sibling attachment can predict emotion regulation abilities, particularly cooperation and conflict. Tibbetts and Scharfe’s (2015) research asserts that insecure sibling attachment correlates with high reactivity, high ineffective arguing, and low levels of cooperation strategies. The reverse is also true, whereby secure sibling attachment correlates with high levels of cooperation. By this logic, sibling relationships may serve as surrogate attachment figures whose relationship with the child causes the child’s emotion regulation abilities to significantly improve despite an insecure mother-child bond.

**The Present Study.** Only a few studies have analyzed child attachment throughout the lifespan, and fewer studies still have analyzed attachment and emotion regulation across the lifespan (Zimmer-Gembeck et al., 2017). Given that the strongest effects predicting emotion regulation abilities from attachment classifications are longitudinal in nature (Zimmer-Gembeck et al., 2017), this current study assesses

participants at 18 months, 5 years, 10 years, and 15 years. Further, Gass et al., (2007) asserts that sibling relationships significantly predicted the reduction of maladaptive emotion regulation abilities only after a stressful life event. Since life stressors and the closeness of a sibling relationship cannot be anticipated, the research will monitor participants across four key developmental milestones. To measure emotion regulation abilities consistently from infancy to adulthood, persistence and distress will be measured during a developmentally appropriate problem-solving task designed to elicit frustration. No studies, to date, have conducted a longitudinal study to analyze sibling relationships as a surrogate attachment figure. This current study focuses exclusively on younger siblings and their relationships with older siblings because birth order can affect perceived closeness to the mother, as older siblings tend to experience the mother's catering more strongly. A younger sibling may be more receptive to caregiving from others who are not the primary parental figures. By attempting to study the last child in the family, this may also limit the possibility of attachment classifications changing after another sibling's birth. Therefore, this study will examine the relation between mother-child attachment and emotion regulation throughout childhood, exploring whether secure sibling relationships can serve as a protective factor on children's maladaptive emotion regulation abilities which may result from insecure mother-child attachment.

Based on previous literature, this study hypothesizes that (1) the security of mother-child attachment will predict emotion regulation abilities, such that securely attached children will demonstrate more persistence and less distress during the frustrating task. Anxious-Ambivalent will demonstrate the most distress and will

demonstrate less persistence than Securely Attached. Anxious-Avoidant will demonstrate the least persistence and less distress than Securely Attached at each point of assessment.

(2) Sibling attachment security will moderate the effect of insecure mother-child attachment security on maladaptive emotion regulation abilities, such that in the case of an insecure mother-child attachment and a secure sibling attachment, distress and persistence will reflect a secure attachment and indicate an improvement since the last visit.

### **Proposed Method**

#### **Participants**

Based on a power analysis table (Cohen, 1992), at least 650 mother-child dyads should be studied because the effect sizes of mother-child attachment on the child's emotion regulation abilities are large in toddlerhood and early childhood but small in middle-childhood and adolescence (Zimmer-Gembeck et al., 2017). However, this study will sample 800 mother-child dyads in order to account for attrition rates, because this longitudinal design spans over 14 years, and to account for a small exclusionary criteria. Given Ainsworth et al.'s (1978) parameters that 65% of children demonstrate a secure attachment, 20% of children demonstrate an Anxious-Avoidant attachment, and 15% demonstrate an Anxious-Ambivalent attachment, 800 child participants allows for approximately 520 participants in the secure attachment group, 160 participants in the Anxious-Avoidant group, and 80 participants in the Anxious-Ambivalent group.

Some participants may be dismissed if, at any point of assessment, their mother or teacher reports, on the Achenbach, Conners, and Quay (ACQ) Behavioral Questionnaire, that the child exhibits symptomatology consistent with a psychopathology. Not all children who indicate a psychopathology will be dismissed and excluded from further participation. Depression or Anxiety, for instance, would not constitute as disqualifying diagnoses. Only children who score highly on categories measuring for Attention-Deficit-Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), and/or Conduct Disorder (CD) will be dismissed because those diagnoses directly affect the child's performance on the emotion regulation task, irrespective of their attachment classifications. Children with ADHD may have more difficulty persisting through the duration of the task, and children with ODD and/or CD may have a greater difficulty modulating their distress appropriately. Thus, in order to better understand the effect of attachment on emotion regulation abilities, children with these diagnoses will be thanked, compensated, but excluded from further participation. Further, dyads categorized as "Disorganized", which is unlikely given the area demographics of this study, will also be thanked and compensated but excluded from further contact and participation. Disorganized attachment is greatly variable and can be an unreliable classification across different points of childhood (Aikins et al., 2009; Zimmer-Gembeck et al., 2017). Because less than 5% of children have ADHD, and/or OD, CDD diagnoses (American Psychiatric Association) and because "Disorganized" attachment is usually only evident in rare cases of severe abuse, sampling 800 mother-child dyads should be enough to conduct this study.

Given the area demographics of this data collection, the child participants are expected to be predominantly White or Hispanic and roughly half of the participants will be male and half of the participants will be female (U.S. Census Bureau, 2016). The mothers of the child participants will likely report a middle socioeconomic status (U.S. Census Bureau, 2016), and are expected to have at least two children. Because this study will focus exclusively on the child born most recently, each child participant will have at least one older sibling. The child participants will be 18 months for the first visit. The second visit will be scheduled about four years later and will be conducted the summer before the child starts kindergarten, so the participants will be about 5 years old. The next visit will be conducted 5 years later, when the participants are 10 years old. The fourth and final visit will be conducted when the participants are 15 years old.

In order to recruit these participants, flyers will be posted in specific areas close to the lab where mothers of toddlers are likely to see them, including daycares, baby stores, grocery stores, ice cream parlors, and local coffee shops. There will also be Facebook postings in groups frequented by mothers, including day care and child development centers. Participants will be encouraged to tell their friends about the study, which could aid in recruitment efforts.

In order to compensate for the participants' transportation expenses, adult participants will be given \$10 for each of the four visits. The child participants will choose a \$5-valued toy in the first two visits, and will be given \$5 cash in the final two visits. Any of the mother and child participants who come to each of the four visits and eventually complete the study will receive a \$20 bonus. Any of the teachers who

complete and return a questionnaire, given in the third or fourth visit, will be entered into a raffle and could win up to \$100 in school supplies for their classroom.

## **Materials**

**Child Psychopathology.** In the second, third, and fourth visits, researchers will administer the ACQ Behavior Questionnaire (Achenbach, Conners & Quay, 1983) to account for any developmental psychopathologies. This scale is validated for children ages 4-16 and includes 21 competency items, 215 problem items, and an open-ended response for parents to include any relevant information that was not covered on the self-report measure (Achenbach et al., 1991). However, the scale will be abridged and the 21 competency questions will be removed because that component of the ACQ does not directly relate to measuring psychopathologies which is the purpose of the scale in this study. The prompt will instruct mothers to read the following 215 items and decide whether the description of children has been true for his/her child at any point in the last two months. These 215 items pertain to 12 categories that includes the most common disorders in childhood: Aggressive Behaviors, Anxious/Depressed, Attentional Problems with Hyperactivity, Attentional Problems without Hyperactivity, Delinquent Behavior, Mean, Obsessive-Compulsive-Perfectionistic, Schizoid, Sex Problems, Socially Inept, Somatic Complaints, Unresponsive-Uncommunicative-Withdrawn (Achenbach et al., 1991). The mothers will circle the number that best suits their child, and the scoring will range from 0 - Never or not at all true (as far as you know), 1 - Once in a while or just a



little, 2 - Quite often or quite a lot, 3 - Very often or very much. The total score can range from 0 to 645. See Appendix A for the abridged scale.

By the third and fourth visits, the child is likely spending more waking hours at school than at home and to provide a more holistic picture of the child's temperament, the teacher will be given ACQ forms to complete. The teacher's version of the ACQ will contain modified language and the original phrasing of "your child" will be changed to "your student". Major discrepancies within the two reports may indicate an insecure attachment, as more specifically assessed at the time of attachment but will also be noted in data analyses.

Psychometric information was obtained to assess the reliabilities and construct validities of the scale. The ACQ yielded strong concurrent validity with three of the most commonly used scales to measure childhood psychopathologies ( $r > .68$ ) (Achenbach et al., 1991). Within the scale itself, gender differences, racial differences, and socioeconomic differences accounted for less than 1% of the variance and were insignificant. This scale has strong predictive validity for child psychopathology because all items in the scale, with the exception of 5, indicate significant differences between children who were referred to professional services and those who were not referred ( $p < .01$ ) (Achenbach et al., 1991).

**Sibling Relationships.** The Sibling Attachment Interview (Noel, Francis & Tilley, 2017) is an adapted version of the Inventory of Parent and Peer Attachment Scale-Revised (IPPA-R; Gullone & Robinson, 2005). The 21-item scale is almost identical to the peer measure except that it substitutes the phrasing "Older brother or sister" instead of

“peer” and eliminates 4 questions from the original 25-item scale. Participants will be instructed to reflect on the relationship with their sibling and identify how true each statement is for them using a 3-point scale (1 = *Never True*, 2 = *Sometimes True*, 3 = *Always True*). Like the IPPA-R, the Sibling Attachment Interview is divided into 3 sub-scales: Communication, Trust, and Alienation (Noel, Francis & Tilley, 2017).

Communication and Trust sub-scales will be summed to assess the level of security within the sibling relationship. Any points on the Alienation sub-scale will be subtracted from this secure relationship composite. As suggested by Noel, Francis and Tilley (2017), items 8, 14, and 18 will be reverse scored in order to avoid an acquisition bias.

Chronbach’s alpha, measuring internal validity, is very strong for the Communication and Trust sub-scales ( $\alpha > .93$ ) and moderately strong for the Alienation sub-scale ( $\alpha = .76$ ; Noel, Francis & Tilley, 2017)

The Sibling Attachment Interview will be administered during the second, third, and fourth visit. See Appendix B for the full scale. At the second visit, this scale will be administered to 5 year olds and, as a result, will be modified. With the help of the research assistant, the child will verbally give answers based on a pictorial scale. The modified version for the 5 year old participants will contain 11-items, instead of 21. These 11-items are reworded for simplification purposes, but are still designed to measure Communication, Trust, and Alienation. Like the Sibling Attachment Interview, a secure attachment is represented by higher scores on Communication and Trust sub-scales and lower scores on the Alienation sub-scale. An insecure attachment is represented by high scores on the Alienation sub scale and low scores on the

Communication and Trust sub-scale. The 5 year old participants will be instructed to point to the pictorial diagram that matches how they feel about their older brother or older sister. The response options will also change to (1 — *No*, 2 — *Kinda or Sometimes*, 3 — *Yes*). To avoid an acquisition bias, item #6 will be reverse scored on this modified scale. See Appendix C for the modified scale.

**Emotion Regulation.** Emotion regulation will be assessed at each visit based on the child's observable behaviors when working on a frustrating task. Emotion regulation will be operationalized as Persistence and Distress. Persistence will be coded by length of time the participant spends actively engaged or focused on the task. Any time spent distracted, which includes aimless wandering during toddlerhood and early childhood, and doodling or zoning-out in middle childhood, and tangential discourse in adolescence, will be subtracted by the total time allotted. Distress will be coded on a 6point Likert scale with developmentally appropriate codes. The first two visits will include the same scale (0 - *no distress present*, 3 - *visible indications of frustration and agitation*, 5 - *crying or yelling*). The third visit will include a slightly modified scale (0 - *no distress present*, 3 - *visible indications of frustration and agitation*, 5 - *crying or yelling*). The final visit will utilize a different scale (0 - *no distress present*, 3 - *snide comments or rude remarks*, 5 - *crying or loud shouting*). Each visit will be videotaped and the video clips will be divided into 30-second intervals. Then, a distress code will be given for each interval and will be averaged across the entirety of the visit to yield a total distress score.

**Infant Emotion Regulation.** At the first visit, the emotion regulation task presented to 18 month toddlers will include getting a toy out of a clear, plastic jar with a

screw-on lid (Calkins & Johnson, 1998). This task will be adequately distressing given that unscrewing the lid is impossible for children at this age. First, the research assistant will let the toddler choose between two toys. After the toddler chooses a toy to play with, the toddler will play with that toy for at least one minute. Then, the research assistant will skillfully take the toy and put it in a clear, plastic jar. The research assistant will screw on the lid and hand it to the toddler by saying, “Can you get the toy out?” The research assistant will then start a timer. If the toddler asks for help, the research assistant will respond by saying, “I want to see you try”. If the toddler becomes overwhelmingly upset or distressed, the research assistant may choose to end the task before the 3 minutes have passed and open the jar to return the toy to the child. This will result in a lower Persistence score. During this frustrating task, the mother will remain in the room, but will be reading a book. If the child comes to the mother to ask for help, the mother is also instructed to respond, “I want to see you try”. After the 3 minutes have passed, the research assistant will say, “Would you like me to open it for you now?” and then open the jar and return the toy to the child. The child will be encouraged to play with the toy for few minutes.

***Early Childhood Emotion Regulation.*** At the second visit, 5 year old children will be presented with a Helplessness Puzzle, modeled after the “Helplessness Box” developed by Kelley & Jennings (2003). This puzzle will contain 10 fitting puzzle pieces and 10 pieces that are slightly too big for the puzzle. The research assistant will first model how to place two fitting pieces together, which may give the false impression that the puzzle is easy to solve. Then, the research assistant will take the pieces apart and tell

the child he/she has 3 minutes to assemble the puzzle. After 3 minutes has passed, the research assistant will debrief the child and explain that the puzzle is “broken” as some pieces do not fit. The research assistant will then give the child a puzzle in which all the pieces do fit so the child feels satisfaction in completing a puzzle. If the child becomes overwhelmingly distressed or deeply agitated with the task, the research assistant may end the task before the 3 minutes have passed. This will decrease the child’s overall Persistence score.

***Middle-Childhood Emotion Regulation.*** At the third visit, the 10 year old children will be presented with an impossible quiz with complex word problems which contain missing data. The research assistant will use deception in explaining that other children perform very well on this impossible exam and finish it relatively quickly. The research assistant will then leave the room and wait 20 minutes for the child to work on the 15-question exam. During these 20 minutes, the child will be discreetly videotaped. After the quiz, the children will be told that the quiz was impossible. The participant may choose to guess arbitrary numbers and finish early, but this will result in a lowered score in Persistence. After the 20 minutes has passed, the research assistant will debrief the participant and explain that the test was unsolvable and impossible.

***Adolescent Emotional Regulation.*** At the fourth visit, adolescents will be asked to dialogue with a research assistant, who will be a stranger, about stressful topics created by Kobak et al., (1993). This stranger will hold conservative, and likely conflicting, views about 6 issues: Money, Dating, Friends, Alcohol/Drugs, Household Rules, and Siblings. For each of these 6 issues, the adolescents will be given 10-minutes to discuss

their views and will be instructed to reach a point of agreement, but this task will likely evoke distress because the research assistant will remain obstinate in his/her views. The interaction between the research assistant and adolescent will be filmed and later coded. The amount of time the adolescent remains on-topic will be subtracted by any time spent discussing an unrelated tangent and will be then composited for Persistence.

**Infant Attachment.** Infants' attachment style will be assessed and categorized using Ainsworth's Strange Situation Procedure (SSP; Ainsworth et al., 1978). The SSP is composed of a series of episodes during which an infant's behavior is observed. At first, the mother and infant will interact for a couple minutes; then a stranger, who will be a research assistant, will enter the room and converse with the mother. Then, the mother will leave and the stranger will proceed to interact with the child. The child's level of engagement will be assessed during this period. Afterwards, the stranger will leave. Next, the mother will return, pausing in the doorway so that the researchers could observe how the infant will greet her. Then the mother will leave again, so the infant will be temporarily alone. Next, the stranger will return, preceded by the mother's reunion, which will end this portion of the observational study.

The infant's behavior will be coded based on the extent to which he/she sought or resisted proximity and contact, as well as the extent to which the he/she engaged with the stranger and exhibited exploratory behaviors (Ainsworth et al., 1978; Bowlby, 1969; Harlow, 1958). Thus, Waters (1978) developed a more precise coding scheme which includes: Proximity Seeking (PS), Contact Maintaining (CM), Proximity and Interaction (PA), Contact Resisting (CR), Distance Interaction (DI), and any spontaneous indication

of positive interest in an adult, which includes smiling, vocalization, gestures, and play. These categories are scored on a 7 point scale, with odd numbers providing a behavior description for each episode. Each sub-score are then summed and classified into different episodes: pre-separation behavior towards (episodes 1 + 2 ), reunion behavior toward mother (episodes 5 + 8), pre-separation behavior toward stranger (episode 3), and behavior toward stranger during separation (episodes 4 + 7). Then the scores within each episode category are classified into attachment styles: Secure, Anxious-Ambivalent, and Anxious-Avoidant. Chronbach's alpha values remained very high for the proximity and resistance categories ( $\alpha > .8$ ) but were only moderately high in coding spontaneous interactions, including gesturing, smiling, or vocalization ( $\alpha > .43$ ).

**Early-Child Attachment.** To determine the quality of attachment in 5 year old children, the procedure developed by Main and Cassidy (1988) will be followed. Main and Cassidy's (1988) modified SSP involves a 1-hour long separation instead of several minute long separations, which is a more developmentally appropriate measure of attachment security. First, the mother and child will watch a film of a 2-year-old child enduring a separation from parents (Robertson & Robertson, 1967-1972, as cited in Main & Cassidy, 1988). The mother will then leave the room for approximately 1 hour. The mother can read a book or do an unrelated activity while the child will engage in a free-play interaction with toys. After 1 hour has passed, the mother will return to the room and for the first 3 minutes of this reunion, the child's behaviors will be coded.

The child's behaviors will be coded based on the extent to which he/she seeks or resists proximity, which are coded on a 9 point scale based on 6 categories: Proximity

Seeking (PS), Contact Maintaining (CM), Proximity and Interaction (PA), Contact Resisting (CR), and Distance Interaction (DI), and any spontaneous indication of positive interest in an adult, which includes smiling, vocalization, gestures, and play. Securely attached children are defined as those who subtly strive for proximity and physical contact upon the reunion while remaining calm throughout the entire episode. Children who are classified as Anxious-Avoidant minimize or restrict opportunities for interactions upon reunion. They may even subtly move away. Children who are classified as Anxious-Ambivalent may exaggerate intimacy with the parent in movements, postures, and tones of voice (Main & Cassidy, 1988). Measuring attachment at age 6, using this protocol, was found to be highly predictable from the infant attachment classifications, as 84% of infants were classified as the same in both assessments. Because Main and Cassidy used the coding schema developed Ainsworth et al., (1978), their results were moderately internally consistent: ranging from ( $\alpha < .43$ ) to ( $\alpha < .8$ ) depending on the item.

**Middle-Child Attachment.** The Child Attachment Interview (CAI), developed by Target, Fonagy and Shmueli-Goetz, (2003), measures child's attachment representation in a narrative format. The interview includes 14 prompts, and additional clarifying questions as needed, about the child's self representation, and representations of primary caregivers, and how those representations were affected in times of conflict, distress, illness, hurt, separation, and loss (Target, Fonagy and Shmueli-Goetz, 2003). The CAI prompts children to give a personal anecdote that may indicate the child's security towards a primary caregiver: "Can you tell me about a time when you were really upset and wanted help?". For this study, the CAI will be modified to exclusively apply to the child's



relationship with his/her mother and questions 9 and 10 were eliminated due to unnecessary sensitive content. See Appendix D for full scale. The interview will be recorded in order to later code the child's responses and behaviors.

There are 9 sub-scales which will be coded as a measure of secure attachment and include: Emotional Openness, Use of Examples, Balance of Positive and Negative References to Attachment Figures, Resolution of Conflict, Involved Anger, Caregiver Idealization, Dismissal, Self-Organization, and Overall Coherence, which includes consistency, development, and reflection. These 9 sub-scales will be coded on a 9 point scale, with the odd values providing descriptions. The coding schema was created as a developmentally appropriate model of the Adult Attachment Interview. Other variables, such as maintenance of eye contact, changes in tone of voice, marked anxiety, changes of posture in relation to the interviewer and contradictions between verbal and nonverbal expressions were considered during assessment and included in a simple behavioral analysis.

Psychometric properties demonstrate that when individual items within the interview were averaged, the CAI has a very strong alpha reliability ( $\alpha = .92$ , Shmueli-Goetz, Target, Fonagy & Datta, 2008). Although the CAI relies heavily on linguistic coherence given its narrative format, Verbal IQ was nearly identical among children with secure and insecure attachments (Shmueli-Goetz, Target, Fonagy & Datta, 2008).

**Adolescent Attachment.** The Adult Attachment Projective (AAP) asks participants to tell a story based on a characters in each of the depicted scenes. Then, researchers will ask the following standardized prompts, "What is happening in this

scene, what led up to the scene, what are the characters thinking and feeling, and what happens in the end. This protocol is continued for each of the 8 ambiguous pictures. The participants' responses are believed to indicate not only their current attachment representation, but also predict attachment security in adulthood as measured by the AAI (George & West, 2001) (See Figure 1 and 2 for examples). The APP, although an adult measure of attachment, is consistently and effectively used in adolescent samples (Gander et al., 2017; George & West, 2001; Kobak et al., 1993; Kobak & Sceery, 1988).

First, the adolescent will be presented with the neutral picture of two children playing with a ball. Then, the adolescent will be presented with *Child at Window*, which depicts a child looking out a window, *Departure*, with an adult man and woman facing each other with suitcases, *Bench*, with a youth sitting alone on a bench, *Bed*, which depicts a child and his/her outstretched arms towards a woman sitting across from him/her, *Ambulance*, with a woman and a child watching someone being put on a stretcher, *Cemetery*, depicting a man standing near a gravesite, and *Child in Corner*, a child standing in the corner. The child's responses will be videotaped in order to later code the child's responses.

The AAP is coded based on 3 dimensions: Discourse, Content Variables, and Defense Variables. Within the construct of Discourse, there is Personal Experience, or the boundary between the self and the fictional character in the story, and Coherence, which includes quality, quantity, relation, and manner of the discussion. To measure Discourse, all seven pictures are taken into account. Within the construct of Content Variables, there is Agency of Self, or the extent to which the self serves as an "internalized secure base"

and can draw upon internal resources, Connectedness which describes a desire to interact with others, and Synchrony which describes the character's actions as reciprocal. While Synchrony is measured by the dyadic pictures, Agency of Self and Connectedness are measured by the pictures with only one person present. Finally, within the construct of Defense Variables, there is Deactivation which is the evidence of minimization, rejection, or distancing, Cognitive Disconnection, or any uncertainty or ambivalence, and Segregated Systems, or any evidence indicating trauma in attachment history. All of these variables are measured on a 3 point rating scale, (0 - *not present*, 3 - *frequently present*; George & West, 2001).

Psychometric information for the AAP was obtained and AAP has high convergent validity ( $r = .85$ ) with the Adult Attachment Interview (AAI; George & West, 2001), and therefore, has high predictive validity in predicting the adolescent's attachment in adulthood (Gander et al., 2017). The participant's gender, age, parental marital status, or number of siblings in the family did not significantly differ among secure classifications and insecure classifications (Gander et al., 2017).

### **Procedure**

During the first visit, the child participant will be 18 months old. The mother participant will first sign a consent form, and the child will verbally assent to playing a game with the research assistant. The mother will sign the consent form while the child plays a game with the research assistant for familiarization. Then, the research assistant will turn on a discreetly-placed video camera and the toy-removal task will be conducted.

While the video camera is still recording, the SSP will be conducted to determine the infant's attachment classification (Ainsworth et al., 1978). Afterwards, the mother and child will be debriefed, thanked, and compensated.

At the second visit, which will occur during the child's summer before their kindergarten year, the mother will sign a consent form and the child will verbally assent to playing a game with the research assistant. The mother will complete the ACQ (Achenbach et al., 1991) while the child completes the modified Sibling Attachment Interview (Noel, Francis & Tilley, 2017). Then, the research assistant will turn on the hidden video camera and the child will be presented with the "Helplessness Puzzle". While the video camera is still recording, the child will complete the modified SSP (Main & Cassidy, 1988). Lastly, the mother and child participant will be debriefed, thanked, and compensated.

For the third visit, the child will now be 10 years old. The mother will first give written consent and the child will give written assent. Then, the mother will complete the ACQ (Achenbach et al., 1991) while the child completes the Sibling Attachment Interview (Noel, Francis & Tilley, 2017). The mother will take an extra ACQ (Achenbach et al., 1991) to give to the child's teacher to complete. After the child finishes the Sibling Attachment Interview and the mother finishes the ACQ, the research assistant will turn on a video camera and present the child with an impossible exam. The video camera will continue filming as the research assistants conduct the CAI, using the interview protocol detailed by Target, Fonagy and Shmueli-Goetz (2003). Both the mother and the child participant will be debriefed, thanked, and compensated.

At the fourth and final visit, the now 15 year old child participant will give written assent while the mother will give written consent. Then, the mother will complete the ACQ (Achenbach et al., 1991) while the adolescent completes the Sibling Attachment Interview (Noel, Francis & Tilley, 2017). The mother will also be asked to give the teacher's copy of the ACQ (Achenbach et al., 1991) to the child's current teacher. Then, the research assistant will turn on a video camera to record the interaction between an adolescent and a research assistant involving points of contention. Next, the adolescent's attachment to his/her mother will be assessed through the APP (George & West, 2001). The participants will be debriefed, thanked, and compensated. The compensation may include a bonus if participants continued with the study during all points of assessment.

After each visit, research assistants who are blind to any of the participant's identifying information will code the participants' attachment classifications and emotion regulation abilities.

### **Ethics**

This proposed study examines mother-child attachment and emotion regulation abilities from infancy to adolescence. Because the study directly involves children, a protected population, the study is at an elevated risk. To reduce this risk as much as possible, children will give assent at each point of assessment, will be debriefed and compensated for each visit, and the data will be kept confidential. The purpose of this study is centered around children and the study cannot be conducted without their participation. Because this study poses a potential intervention that could significantly improve potentially adverse outcomes in psychosocial domains, the knowledge to be

gained from this study outweighs the potential risks from the participants, even if they are a protected population.

In order to accurately assess emotion regulation abilities, there will be a minimal use of deception in two of the visits. At the 5 year and the 10 year visit, children will be under the impression that the puzzle and test are easy to solve. The research assistant will state that other participants their age have finished the puzzle or test relatively quickly and easily. However, the puzzle is broken and the test is impossible. This use of deception should provoke frustration in the child, which allows for his/her true coping mechanisms can be assessed. Children will be debriefed immediately after the task, as the research assistant will apologize and explicitly explain that the puzzle is broken and the test is impossible. But, the slight use of deception is necessary to get an accurate picture of the child's emotion regulation abilities. The true purpose of the study will be revealed at the very last visit. Until then, participants will be told that the study seeks to understand "Family Dynamics". Only after the participants have completed the study will they learn that the ultimate purpose of the study is to analyze mother-child attachment, sibling relationships, and the child's emotion regulation abilities. The use of deception is necessary so that the participants do not modify their behaviors.

Participants will voluntarily participate. If, at any point, the participants would like to withdraw they may do so without any penalty. Participants will also be thoroughly debriefed, thanked, and compensated after each visit. Children will be assured that each of the tasks gauging emotion regulation abilities are frustrating in nature. At each visit, the child participants will be debriefed that the tasks were designed to be frustrating. At

the 5 year and 10 year visit, participants will be informed that those tasks were impossible, and the lie that other children had more success on the task was used in order to evoke more frustration to observe emotion regulation abilities. At every visit, the mother and child will be thanked and compensated. The compensation will be sufficient enough to cover transportation expenses but also minimal enough to not be considered coercive.

Because the study is longitudinal in nature, contact information must be kept on file for scheduling future visits. However, all data collected in assessments will be kept confidential. The coders, tasked with classifying attachment styles, emotion regulation abilities, and interpreting sibling and pathologies scales, will be blind to the participant's identifying information. On the other hand, the research assistants scheduling the visits will be blind to any research data pertaining to the participant they are contacting. Mothers will consent to being videotaped before the visit. Visits will be videotaped, but the videotapes will be deleted as soon as the coder has finished coding. The videos will be labeled with a randomly assigned participant number.

The participant's confidentiality is especially important because the ACQ, which controls for potential psychopathologies in the child, may contain sensitive information. This scale, however, is essential to the purpose of the study because an externalizing disorder could directly affect the child's observable emotion regulation abilities, and therefore confound with the quality of mother-child attachment. This scale may cause slight discomfort. However, adult participants, both mothers and teachers, will be told that they can choose not to complete the scale. The mother participants may also receive

a list of referrals to child psychologists and therapists should they choose to seek professional help. However, the research assistants will not inform the parent of any data on these scales, unless the scales indicates that the child is in danger of being a risk to self or others. If, for example, the mother indicated child suicidality or self-harm in the scale, the researcher will legally take necessary steps to follow up about it, but the researcher will not report any other information about any other reported symptoms.

The knowledge to be gained has potential to bolster children's psychosocial outcomes through sibling relationships, which has not been extensively studied in the literature. These findings may encourage future studies to explore ways to improve sibling relationships to potentially buffer against adverse affects, particularly emotion dysregulation, which can result from an insecure mother-child bond. This study can be helpful to the participants themselves as it provides an opportunity to reflect upon their mother and sibling relationships, which can be encouraging. This study can also help greater society as it can be used to inform parenting practices, namely the importance of sensitivity to the child's emotional responses and the importance of a secure mother-child bond. It can also inform psychologists' understanding of family dynamic and more specifically, sibling relationships and how it can relate to the child's psychosocial adjustment. Finally, sibling relationships can be an important avenue to explore in clinical practices and therapy. Therefore, this study contains significant importance to understanding children and their development, which far outweighs any potential risks it may also pose.



### Expected Results

The first hypothesis examines whether the security of mother-child attachment will predict emotion regulation abilities. Two Mixed Model ANOVAs will be conducted to test the direction of the proposed hypotheses. Age will be the within factor and attachment will be the between factor. Results are expected to indicate a linear pattern such that as the participant ages, the level of persistence will increase and the level of distress will decrease:  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$ . In the between factor, attachment classifications will be assessed with persistence as the dependent variable. Across each assessment, securely attached children ( $M = x.xx, SD = x.xx$ ) will demonstrate the most persistence, and Anxious-Ambivalent children ( $M = x.xx, SD = x.xx$ ) will demonstrate less persistence than securely attached children but more persistence than Anxious Avoidant children ( $M = x.xx, SD = x.xx$ ) who will demonstrate the least persistence of all three attachment classifications:  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$ . Then, attachment classifications will be assessed with distress as the dependent variable. Anxious-Ambivalent children will exhibit the most distress, and securely attached children will exhibit less distress than Anxious-Ambivalent children but more distress than Anxious Avoidant children. Anxious-Avoidant children will exhibit the least distress of all three attachment classifications:  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$ . There will not be an interaction effect between time and attachment classifications because the relationship between attachment classifications and emotion regulation abilities will not change over time.  $F(x, xxx) = x.xx, n.s.$  These results will likely confirm previous findings (Ainsworth et al., 1978; Kelley & Jennings, 2003; Main & Cassidy, 1988; Matas

et al., 1978; Sroufe, 2005a) that securely attached children demonstrate more persistence during difficult cognitive tasks and demonstrate less distress that is a more calm affect throughout distressing events. These results will also test whether Cassidy's (1994) theory that Anxious-Ambivalent will exhibit heightened distress while Anxious-Avoidant will exhibit suppressed distress is confirmed through empirical research.

The second hypothesis predicts that sibling attachment security will moderate the effect of insecure mother-child attachment security on maladaptive emotion regulation abilities, such that in the case of an insecure mother-child attachment and a secure sibling attachment, the child's distress will decrease and persistence will increase. These emotion regulation abilities may seem to reflect a child with a secure mother-child attachment and will indicate an improvement since the child's last visit. A multiple regression will be conducted to analyze the main effect of mother-child attachment security on persistence  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$  and distress  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$ , the main effect of sibling attachment security on persistence  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$  and distress  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$ , and the interaction effect of mother-child attachment and sibling attachment security on persistence  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$  and distress  $F(x, xxx) = x.xx, p < .xx, (r = .xx)$ . In this way, sibling attachment will buffer the adverse affects of insecure attachment and maladaptive emotion regulation abilities.

This study will record the number of siblings within the household and gender of child and enter as potential covariates. The child's gender is expected to account for some variability in emotion regulation abilities, such that girls will demonstrate more

persistence and less distress than boys. This difference will especially become apparent during middle-childhood and adolescence which will be in the third and fourth visits. However, previous research has concluded that while gender does account for some variability in emotion regulation abilities, it is not as significant as the child's attachment to his/her mother (Morris et al., 2007; Tibbetts & Scharfe, 2015; Zimmer-Gembeck et al., 2017; Zeman et al., 2006). Thus, multivariate analyses will ensure that the number of siblings in the family and the child's gender will not significantly predict the child's level of persistence or distress  $r = X.XX$ , *n.s.*

### **Discussion**

The aim of this study was twofold: to extend previous literature by examining the influence of mother-child attachment on the child's emotion regulation abilities from infancy to adolescence, and to explore a new theory in determining whether a secure attachment with older sibling can increase the child's persistence and decrease the child's distress even in the face of an insecure mother-child relationship. Previous literature describes the influence of mother-child attachment on the child's emotion regulation abilities in toddlerhood, specifying that securely attached children will demonstrate heightened persistence and minimal distress while insecurely attached children will demonstrate the inverse trend (Calkins & Johnson, 1998; Kelley & Jennings, 2003; NICHD Early Child Care Research Network, 2004; Matas et al., 1978). This study extends these previous findings by testing Cassidy's (1994) theory and examining whether children with an Anxious-Avoidant attachment will suppress their distress, while

children with an Anxious-Ambivalent attachment will heighten their distress during these tasks.

Further, while most studies examine child-infant attachment and the toddler's developing emotion regulation abilities, fewer studies observe whether this trend continues throughout the child's development (Aikins et al., 2009; Sroufe et al., 2005b; Zimmer-Gembeck et al., 2017). When studying middle-childhood and adolescence, researchers often shift from analyzing mother-child attachment to peer attachment quality (Contreras et al., 2000; Seibert & Kerns, 2009). However, this current study will fill these gaps in the literature and provide more direct links between mother-child attachment security and the child's levels of persistence and distress from infancy to adolescence.

Finally, few studies propose an intervention to facilitate adaptive emotion regulation abilities if the child develops an insecure attachment to his/her mother (Zimmer-Gembeck et al., 2017). One study concludes that a secure peer relationship can buffer the effects of insecure mother-child attachment on the child's emotion regulation abilities (Contreras et al., 2000). Sibling relationships are of particular interest and unique importance because they are part of the family dynamic and can step in as a primary caregiver if the mother is unavailable (Seibert & Kerns, 2009; Stewart, 1983) which may reduce the child's internalizing symptoms (Gass et al., 2007; Milevsky, 2005). However, no studies have demonstrated these lasting effects on the child's outwardly manifested emotion regulation abilities. This study explores whether an older sibling can serve as a surrogate attachment figure and if the secure attachment formed between two siblings can have lasting effects on the child's level of persistence and distress.

A previous finding asserts that the quality of sibling relationships, alone, was not significant enough to predict the reduction of internal emotion regulation abilities and must be in the aftermath of a significant life stressor (Gass et al., 2007). Since the degree to which a child feels securely attached to his/her sibling and the presence of significant life stressor cannot be predicted, a longitudinal study will be conducted. The longitudinal design is limited in that there are only four visits with about a five year gap in between. During the five year gap, the family unit may experience significant life stressors which may inadvertently affect the child's attachment and emotion regulation abilities. This study is designed to account for differences between assessments because researchers will analyze the participant's attachment and emotion regulation abilities at each visit and will administer the ACQ to both the mother and the teacher to control for psychopathologies. Even still, the ACQ is limited. The ACQ was designed with high concordance rate to the DSM-III (Achenbach et al., 1991), but no recent updates have been made to examine its concordance rate to the DSM-V. Further, the ACQ does not have a subcategory for symptoms consistent with Autism Spectrum Disorder (ASD) nor does it assess for Learning Disabilities (LD). Children with ASD or LD may demonstrate less persistence on the task because of their disorder and disability, irrespective of their attachment classification. This study, however, cannot assess for every potential confounding diagnosis. Therefore, this study is inherently limited because of its longitudinal nature, and the attempt to reduce the error in utilizing the ACQ can be limited as well.

This current study is also limited in its operational definition of emotion regulation abilities. This study only measured persistence and distress, even though

emotion regulation abilities include both observable, extrinsic, processes and intrinsic processes, like cognitions and emotions (Thompson, 1994). By only analyzing observable emotion regulation abilities, this study seems to scratch the surface of a much deeper phenomenon. A physiological measure would give an indication of the participant's reactivity, and could detect more intrinsic processes, but the literature does not present a reliable and consistent physiological measure. Future studies should develop a physiological measure for researchers to more fully encompass emotion regulation abilities to include underlying reactivity, emotions, and cognitions.

Studies should further explore attachment not only in the context of a mother-child relationship, but also when extended to include the broader family dynamic. After all, the child's attachment to one member of the family may affect the child's attachment to other members of the family. Father-child attachment is an avenue which should be explored given that some children may feel closer to their fathers. Theoretically, an insecure mother-child relationship could still result in adaptive emotion regulation abilities if the child developed a secure attachment to his/her father. While this study only analyzed the role of the older sibling, the role of the younger sibling may have important implications as well. The younger sibling may even have a stronger impact on the older child's emotion regulation abilities if the younger sibling is more self-regulated or has a greater inclination to give care. Future studies should explore how the sibling's gender could contribute to the extent to which a sibling takes on a caregiver role; because, for instance, a female sibling may be more socialized to provide care as opposed to a male sibling. In this way, there may be significant interaction effects between the sibling's birth

order and gender. Additionally, researchers could focus on the sibling who serves as a caregiver and examine if serving as a surrogate attachment figure may impact his/her relationship to the parental unit and his/her own psychosocial development.

This study not only contributes to the literature by examining the role of mother-child attachment and emotion regulation abilities in childhood and adolescence, where the findings are sparse, but also presents a new possibility wherein siblings could serve as surrogate attachment figures in the presence of an insecure mother-child dyad. This potential intervention has significant implications on understanding the family dynamic and sibling's roles within it. In turn, these results may inform parenting behaviors and clinical practices in family therapy. Family units, and sibling relationships in particular, are formative to children's development, and while they may provoke frustration, this study suggests that they may also facilitate adaptive emotion regulation abilities to better cope with such frustration.

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Appendix A: ACQ Behavioral Questionnaire

X. Below is a list of items that describe children. As you read each item, please decide whether it has been true of your child at any time during the past two months. Then circle the number that best describes your child.

0 = Never or not at all true (as far as you know)

1 = Once in awhile or just a little

2 = Quite often or quite a lot

3 = Very often or very much

1. Absentminded or forgets easily	0 1 2 3	63. Echoes phrases that others say to him/her	0 1 2 3
2. Acts like opposite sex	0 1 2 3	64. Excess weight loss without being sick	0 1 2 3
3. Acts silly or giggles too much	0 1 2 3	65. Excitable	0 1 2 3
4. Acts spitefully	0 1 2 3	66. Fails to finish things he/she starts	0 1 2 3
5. Acts too young for his/her age	0 1 2 3	67. Fears certain animal, places, or situations other than school (give details):	0 1 2 3
6. Admires people who break the law	0 1 2 3	68. Fears going to school	0 1 2 3
7. Admires tough guys	0 1 2 3	69. Fears he/she might do something bad	0 1 2 3
8. Afraid of making a mistake	0 1 2 3	70. Feelings are easily hurt	0 1 2 3
9. Afraid to try new things	0 1 2 3	71. Feels he/she can't succeed	0 1 2 3
10. Always on the go	0 1 2 3	72. Feels he/she has to be perfect	0 1 2 3
11. Argues	0 1 2 3	73. Feels or complains that no one loves him/her	0 1 2 3
12. Angry moods	0 1 2 3	74. Feels too guilty	0 1 2 3
13. Avoids looking others in the eye	0 1 2 3	75. Feels worthless or inferior	0 1 2 3
14. Bites fingernails	0 1 2 3	76. Generally seems odd or peculiar	0 1 2 3
15. Blames others for own mistakes or problems	0 1 2 3	77. Gets angry if routines are disrupted	0 1 2 3
16. Bossy	0 1 2 3	78. Gets hurt a lot; accident prone	0 1 2 3
17. Bowel movements outside toilet	0 1 2 3	79. Gets into everything	0 1 2 3
18. Brags, boasts	0 1 2 3	80. Gets picked on by other kids	0 1 2 3
19. Bullies or is mean to others	0 1 2 3	81. Gets teased a lot	0 1 2 3
20. Can't concentrate, can't pay attention for long	0 1 2 3	82. Goes on eating binges	0 1 2 3
21. Can't get mind off certain thoughts (give details):	0 1 2 3	83. Hangs around kids who get in trouble	0 1 2 3
22. Can't make up mind or make choices	0 1 2 3	84. Has a hard time making friends	0 1 2 3
23. Can't sit still, squirms, or fidgets	0 1 2 3	85. Has difficulty making conversation with other kids	0 1 2 3
24. Can't stand having things out of place	0 1 2 3	86. Has trouble following directions	0 1 2 3
25. Can't stand waiting; wants everything now	0 1 2 3	87. Has trouble getting to sleep	0 1 2 3
26. Cheats	0 1 2 3	88. Hears things that aren't there (give details):	0 1 2 3
27. Clings to adults or is too dependent	0 1 2 3	89. Hits others	0 1 2 3
28. Complains too much	0 1 2 3	90. Hums or makes odd noises	0 1 2 3
29. Complains of aches or pains in arms or legs (without medical cause)	0 1 2 3	91. Ignored by other kids	0 1 2 3
30. Complains of dizziness (without medical cause)	0 1 2 3	92. Impulsive or acts without thinking	0 1 2 3
31. Complains of headaches (without medical cause)	0 1 2 3	93. Insensitive to others' pain	0 1 2 3
32. Complains of loneliness	0 1 2 3	94. Insists that certain things always be done in the same order (give details):	0 1 2 3
33. Complains of nausea or feeling sick (without medical cause)	0 1 2 3	95. Involved in sex play with others	0 1 2 3
34. Complains of stomach aches or cramps (without medical cause)	0 1 2 3	96. Irritable	0 1 2 3
35. Confused or seems to be in a fog	0 1 2 3	97. Is a perfectionist; gets upset if everything is not exactly right	0 1 2 3
36. Constantly asks for help	0 1 2 3	98. Is dangerously daring	0 1 2 3
37. Constipated, doesn't move bowels	0 1 2 3	99. Is preoccupied with "dirty" pictures or stories	0 1 2 3
38. Cries without good reason	0 1 2 3	100. Lacks self-confidence	0 1 2 3
39. Cruel to animals	0 1 2 3	101. Lies	0 1 2 3
40. Day-dreams or gets lost in his/her thoughts	0 1 2 3	102. Looks unhappy without good reason	0 1 2 3
41. Defiant	0 1 2 3	103. Loses train of thought	0 1 2 3
42. Deliberately annoys others	0 1 2 3	104. Loss of ability to have fun	0 1 2 3
43. Deliberately destroys things belonging to others	0 1 2 3	105. Leud	0 1 2 3
44. Deliberately harms self or attempts suicide	0 1 2 3	106. Makes repetitious movements	0 1 2 3
45. Deliberately hurts other kids	0 1 2 3	107. Mumbles instead of speaking clearly	0 1 2 3
46. Deliberately tries to vomit	0 1 2 3	108. Needs constant supervision	0 1 2 3
47. Demands attention	0 1 2 3	109. Nervous movements or twitching	0 1 2 3
48. Destroys his/her own things	0 1 2 3	110. Nervous, highstrung, or tense	0 1 2 3
49. Diarrhea or loose bowels (without medical cause)	0 1 2 3	111. Nightmares	0 1 2 3
50. Disobedient at home	0 1 2 3	112. No interest in making friends	0 1 2 3
51. Disobedient at school	0 1 2 3	113. Not liked by other kids	0 1 2 3
52. Does things slowly and incorrectly	0 1 2 3	114. Overactive	0 1 2 3
53. Doesn't answer when people talk to him/her	0 1 2 3	115. Overeating	0 1 2 3
54. Doesn't get along with other kids	0 1 2 3	116. Overtired	0 1 2 3
55. Doesn't seem to feel guilty after misbehaving	0 1 2 3	117. Overweight	0 1 2 3
56. Doesn't want to go out of home	0 1 2 3	118. Passive or lacks initiative	0 1 2 3
57. Dresses like or plays at being opposite sex	0 1 2 3	119. Persists and nags; can't take no for an answer	0 1 2 3
58. Drowsy, sleepy	0 1 2 3	120. Physically attacks people	0 1 2 3
59. Easily distracted	0 1 2 3	121. Picks nose, skin, or other parts of body	0 1 2 3
60. Easily flustered around other people	0 1 2 3	122. Picks on younger kids	0 1 2 3
61. Easily jealous	0 1 2 3	123. Plays with own sex parts in public	0 1 2 3
62. Eats or drinks things that are not food (give details):	0 1 2 3		

Please see other side

0 = Never or not at all true (as far as you know)				2 = Quite often or quite a lot							
1 = Once in awhile or just a little				3 = Very often or very much							
124.	Plays with own sex parts too much	0	1	2	3	170.	Stays out late at night	0	1	2	3
125.	Poor school work	0	1	2	3	171.	Stays with adults to avoid other kids	0	1	2	3
126.	Poorly coordinated or clumsy	0	1	2	3	172.	Steals at home	0	1	2	3
127.	Prefers to be alone	0	1	2	3	173.	Steals directly from people (purse snatching, mugging, etc.)	0	1	2	3
128.	Problems with eyes, other than those corrected by glasses (give details): _____	0	1	2	3	174.	Steals outside home in a sneaky way (shoplifting, bike snatching, etc.)	0	1	2	3
129.	Pulls at the hands or clothes of adults	0	1	2	3	175.	Stores up things he/she doesn't need	0	1	2	3
130.	Punishment doesn't change his/her behavior	0	1	2	3	176.	Strange behavior (give details): _____	0	1	2	3
131.	Quickly shifts from one activity to another	0	1	2	3	177.	Stubborn	0	1	2	3
132.	Rapid shifts between sadness and excitement	0	1	2	3	178.	Sucks thumb	0	1	2	3
133.	Rashes or other skin problems without known medical cause (give details): _____	0	1	2	3	179.	Sudden changes in mood or feelings	0	1	2	3
134.	Refuses to eat	0	1	2	3	180.	Sulks	0	1	2	3
135.	Refuses to talk in certain situations	0	1	2	3	181.	Suspicious of others	0	1	2	3
136.	Repeats certain acts over and over (give details): _____	0	1	2	3	182.	Swears or uses obscene language	0	1	2	3
137.	Repeats certain words or phrases over and over	0	1	2	3	183.	Talks about killing self	0	1	2	3
138.	Resists going to school	0	1	2	3	184.	Talks or cries out in sleep	0	1	2	3
139.	Restless movements during sleep	0	1	2	3	185.	Talks or thinks about sex too much	0	1	2	3
140.	Runs away from home	0	1	2	3	186.	Talks too much	0	1	2	3
141.	Sad or depressed	0	1	2	3	187.	Teases other kids	0	1	2	3
142.	Says strange things or expresses strange ideas (give details): _____	0	1	2	3	188.	Temper tantrums or hot temper	0	1	2	3
143.	Says things that don't make sense	0	1	2	3	189.	Thinks self too fat despite normal weight	0	1	2	3
144.	Screams	0	1	2	3	190.	Threatens people	0	1	2	3
145.	Secretive, keeps things to self	0	1	2	3	191.	Too concerned about own health	0	1	2	3
146.	Seems to need to touch everything	0	1	2	3	192.	Too concerned with neatness or cleanliness	0	1	2	3
147.	Seems to think others are out to get him/her	0	1	2	3	193.	Too fearful or anxious	0	1	2	3
148.	Seems unable to tell the difference between imaginary and real things or events	0	1	2	3	194.	Truant, skips school	0	1	2	3
149.	Sees things that aren't there (give details): _____	0	1	2	3	195.	Uncooperative	0	1	2	3
150.	Self-conscious or easily embarrassed	0	1	2	3	196.	Underactive, slow moving, or lacks energy	0	1	2	3
151.	Selfish or won't share	0	1	2	3	197.	Unusually curious about sex	0	1	2	3
152.	Sets fires	0	1	2	3	198.	Unusually messy or sloppy	0	1	2	3
153.	Sexual problems (give details): _____	0	1	2	3	199.	Unusually preoccupied with gore and violence	0	1	2	3
154.	Shows fear of strangers	0	1	2	3	200.	Uses alcohol without parents' approval	0	1	2	3
155.	Shows little affection toward people	0	1	2	3	201.	Uses drugs for non-medical purposes (give details): _____	0	1	2	3
156.	Shows little interest in things around him/her	0	1	2	3	202.	Vandalizes property with others	0	1	2	3
157.	Shows no fear of getting hurt	0	1	2	3	203.	Vomits, throws up (without medical cause)	0	1	2	3
158.	Shows off or clowns	0	1	2	3	204.	Wakes up often at night	0	1	2	3
159.	Shows panic for no good reason	0	1	2	3	205.	Wakes up too early in the morning	0	1	2	3
160.	Shy or timid	0	1	2	3	206.	Wets self during the day	0	1	2	3
161.	Sleeps less than most kids his/her age	0	1	2	3	207.	Wets the bed	0	1	2	3
162.	Sleeps more than most kids during the day and/or night	0	1	2	3	208.	Whines	0	1	2	3
163.	Smokes tobacco	0	1	2	3	209.	Wishes to be of opposite sex	0	1	2	3
164.	Sniffs at things as if they smelled	0	1	2	3	210.	Withdrawn, doesn't get involved with others	0	1	2	3
165.	Speaks in short sentences or single words	0	1	2	3	211.	Won't stick up for self	0	1	2	3
166.	Speech is hard to understand	0	1	2	3	212.	Worries	0	1	2	3
167.	Speech problems (give details): _____	0	1	2	3	213.	Would rather play with older kids than with kids his/her age	0	1	2	3
168.	Stares into space or seems preoccupied	0	1	2	3	214.	Would rather play with younger kids than with kids his/her age	0	1	2	3
169.	Starts fights	0	1	2	3	215.	Writes odd words or phrases on schoolwork, in books, etc.	0	1	2	3
						216.	Please add any other problems your child has.				
								0	1	2	3
								0	1	2	3
								0	1	2	3
								0	1	2	3

Please be sure you have answered all items

XI. Feel free to add any additional comments that will help in understanding your child \_\_\_\_\_

\_\_\_\_\_

**Appendix B: Sibling Attachment Interview**

Reflect on the relationship with your older sibling and identify how true each statement is for you using a three-point scale (1 = “never true”, 2 = “sometimes true”, 3 = “always true”)

1. I like to get my brother or sisters’ opinions on things I’m worried about (C)
2. My brother or sister can tell when I’m upset about something (C)
3. When we talk, my brother or sister listens to my opinion (C)
4. I wish I had a different brother or sister (A)
5. My brother or sister understands me (C)
6. My brother or sister supports me to talk about my worries (T)
7. My brother or sister accepts me as I am (T)
8. My brother or sister doesn’t understand my problems (Reverse Scored: C)
9. I do not feel like I belong when I am with my brother or sister (A)
10. My brother or sister is a good sibling (T)
11. When I am angry about something, my brother or sister tries to understand (C)
12. My brother or sister helps me to understand myself better (C)
13. My brother or sister cares about the way I feel (T)
14. I feel angry with my brother or sister (Reverse Scored: T)
15. I can count on my brother or sister to listen when something is bothering me (T)
16. I trust my brother or sister (T)
17. My brother or sister respects my feelings (T)
18. I get upset a lot more than my brother or sister knows about (Reverse Scored: C)
19. My brother or sister gets annoyed with me for no reason (A)
20. I tell my brother or sister about my problems and troubles (T)
21. If my brother or sister knows that I am upset about something, they ask me about it (C)

(C delineates that the item belongs to the *Communication* subcategory; T delineates *Trust* subcategory, and A delineates the *Alienation* category. Participants will not be presented with the letter next to each item, but it is presented for instructions in coding)



**Appendix C: Sibling Attachment Interview: Modified Pictorial Version**

After I read something, I want you to point to “Yes” if it is like your older brother/sister, “Maybe” if it is kinda or sometimes like your older brother/sister, or “No” if it is not like your older brother/sister.

1. My brother or sister knows when I get upset (C, #2 on original scale)
2. My brother or sister listens to me when I talk to him/her (C, #3)
3. I wish I had a different brother or sister (A, #4)
4. I have a good sister/brother (T, #10)
5. My brother or sister cares about the way I feel (T, #13)
6. I feel angry with my brother or sister (Reverse Scored: T #11)
7. I know my brother or sister will listen to me when I’m upset (C, #15)
8. I tell my brother or sister about my problems (T, #20)
9. My brother or sister gets annoyed with me for no reason (A)
10. When I get upset, I talk to my sister/brother (C, #11)
11. I know my brother/sister won’t tell my secrets (T, #16)



**Yes**



**Kinda/Sometimes**



**No**

**Appendix D: The Child Attachment Interview (CAI) Protocol**

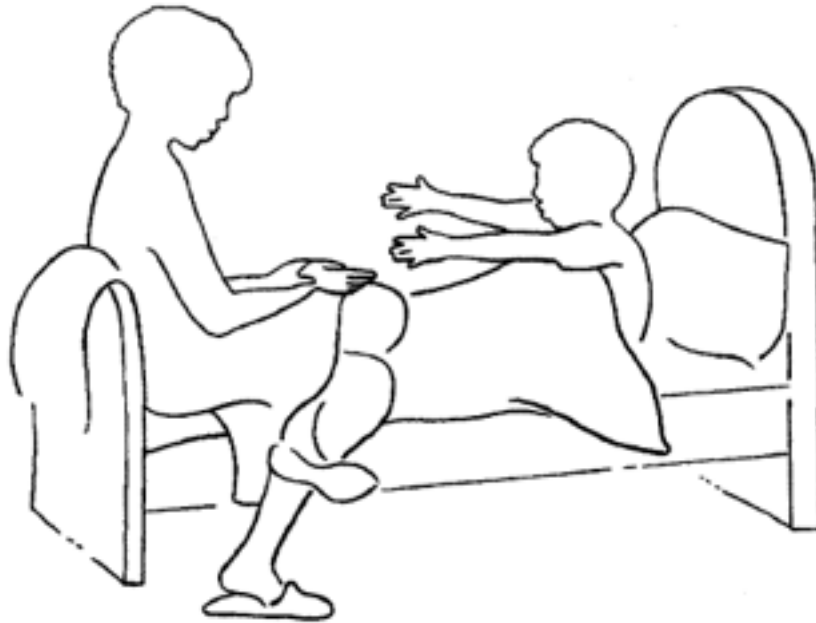
“This is an interview not a test. We would like to know what things are like in your family from your point of view.”

- 1) Can you tell me about the people in your family?  
— The people living together in your house (then ask about extended family)
- 2) Tell me three words that describe yourself, that is what sort of person you are?  
— Ask child to provide examples for each description
- 3) Can you tell me three words to describe your relationship with your mom, that is, what it’s like to be with your mom?  
— Ask child to provide examples for each description
- 4) What happens when your mom gets cross with you or tells you off?  
— Ask child to tell a story about it
- 5) Can you tell me about a time when you were really upset and wanted help?  
— Ask child to tell a story about it
- 6) Do you ever feel that your mom doesn’t really love you?  
— When? Do they know that you feel that way?
- 7) What happens when you’re ill?  
— Ask child to provide an example
- 8) What happens when you get hurt?  
— Ask child to provide an example
- 10) Has anything [else] really big happened to you that upset, scared or confused you?  
— Ask child to tell a story about it
- 11) Has anyone important to you ever died? Has a pet you cared about died?  
— Ask child to tell a story about it. What did you feel and how do you think others felt?
- 12) Is there anyone that you cared about who isn’t around anymore?
- 13) Have you been away from your mom for longer than a day?  
— Ask child to tell a story about it. What was it like when you saw them again?
- 14) Do your parents sometimes argue?

— Ask child to tell a story about it. How do you feel when they argue?

15) In what ways would you like/not like to be like your mom?

16) If you could make three wishes when you are older what would they be?



*Figure 1: Bed*



*Figure 2: Child in Corner*