Examining the Bidirectional Relationships Between Maternal Intrusiveness and Child Anxiety: A Longitudinal Study from Infancy to Middle Childhood

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ABSTRACT

Myriad parenting behaviors have been linked to the development of internalizing disorders in children. Intrusive parenting, which is characterized by autonomy-limiting behaviors that hold the parent's agenda above that of the child, seems to uniquely contribute to the onset of child anxiety. In laboratory tasks, anxious mothers demonstrate greater levels of intrusiveness when compared to nonanxious mothers, suggesting that intrusive behaviors may be one mechanism through which anxiety is transmitted from parent and child. Other studies suggest that parental intrusiveness is evoked in the presence of an anxious child, providing evidence for bidirectionality. The current study investigated the bidirectional effects between maternal intrusiveness and anxious symptomology from infancy to middle childhood. Participants were a community sample of 218 infant-mother dyads, and maternal intrusiveness was assessed at seven time points (5 and 10 months; 2, 3, 4, 6 and 9 years) while child anxiety symptoms were assessed at the last four timepoints. Results suggest that maternal intrusiveness remains relatively stable from infancy to middle childhood, but we found no evidence of concurrent or prospective relationships between intrusiveness and child anxiety. Broadly, this study suggests that current operationalizations of intrusive parenting may only be sufficient at capturing these behaviors during infancy and early childhood, but inadequate for middle childhood. Potential directions for future studies using this parenting construct are discussed.

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CHAPTER ONE: INTRODUCTION AND GENERAL INFORMATION

In 2016, anxiety disorders affected approximately 7.1% of children and adolescents aged 3 to 17 years in the United States (Ghandour et al., 2019). Comparatively, 3.2% had a current depressive disorder (Ghandour et al., 2019), 7.4% of children and adolescents had a current behavioral disorder, and 8.4% had a current attention-deficit/hyperactivity disorder (ADHD) (Danielson et al., 2018). Despite this high prevalence, youth with anxiety disorders often go untreated compared to their counterparts with other disorders; approximately 80% of adolescents with depression, 45% with behavioral disorders, and 60% with ADHD received treatment, compared to only 20% of those with anxiety disorders (Merikangas et al., 2011). This is particularly concerning given that many children also experience significant but subclinical levels of anxiety, that is anxiety that does not meet all of the criteria necessary for an official diagnosis. Indeed, anxiety is often considered on a spectrum from normative to clinical, and impairment can, and does, occur at any level (Evans et al., 2005). Due to its high prevalence and dearth of accessible treatment, childhood anxiety has been labeled a significant public health issue (Allen et al., 2020), making it a prime target for continued research.

While child anxiety disorders and symptomology can be debilitating in and of themselves, they are also linked to numerous other negative consequences. Broadly, childhood anxiety disorders are linked to significant impairments in domains such as life satisfaction, family functioning, academic performance, and social functioning (Swan & Kendall, 2016). In early childhood, anxiety disorders are associated with decreased coping abilities and increased reports of loneliness (Weeks et al., 2009). Left untreated, or unsuccessfully treated, anxiety may be related to future pathology. Among children who received treatment for an anxiety disorder, those for whom the treatment was unsuccessful report increased substance use in adolescence

and early adulthood (Kendall et al., 2004). The presence of an anxiety disorder in adolescence significantly increases one's chance of having an anxiety disorder, major depressive disorder, or a substance use disorder in early adulthood (Woodward & Fergusson, 2001). Outside of related pathologies, adolescent anxiety disorders are linked to early parenthood (Woodward & Fergusson, 2001), and anxiety is associated with hypertension and obesity in adulthood (Jonas et al., 2009). From a public health perspective, it is therefore critically important to identify factors which contribute to the development of anxiety symptoms, especially in infancy and early childhood. By understanding contributory factors of these disorders, psychologists can work towards creating effective prevention programs and accessible interventions for those affected.

Person-level variables such as temperament, defined as biologically-based individual differences in traits such as emotional reactivity, influence the development of anxiety in children (e.g., Pérez-Edgar & Fox, 2005; Lonigan & Phillips, 2001). In addition, as children spend most of their early lives with a primary caregiver, there is ample opportunity for parents to directly or indirectly shape the ways in which their children view and interact with the world. As such, there is a growing body of evidence suggesting that negative parenting behaviors such as intrusiveness, characterized by developmentally inappropriate overcontrol, play a unique role in pediatric anxiety (see McLeod et al., 2007 for review). While intrusiveness is often conceptualized as a causal factor in the development of child anxiety, there is also evidence that an anxious child may evoke intrusiveness in parents (Hudson et al., 2009), suggesting a cyclic, bidirectional process between parent and child. Much of this evidence is cross-sectional, however, and there are no studies to our knowledge that directly assess the relationship between intrusive parenting behaviors and child anxiety over time. This study begins to fill that gap in knowledge by examining changes in these two constructs across infancy and early childhood,

examining potential bidirectional influences that may shed light on how parenting plays a role in the development and maintenance of childhood anxiety.

CHAPTER TWO: LITERATURE REVIEW

Anxiety in Childhood

Anxiety presents in distinct ways throughout different stages of development, particularly through exacerbations of normative fears that may become pathological and persistent. Infants show selective attachment to a caregiver as early as two months after birth (Mizukami et al., 1990). At this point, an infant may often seek physical contact with the caregiver and may become understandably upset when that contact is removed (Beesdo et al., 2009). Subsequently, a child in late infancy up to early childhood may experience developmentally appropriate fear or anxiety with strangers or when separated from a caregiver. When it becomes excessive and persistent, this fear of being apart from a caregiver can be clinically diagnosed as separation anxiety disorder. Separation anxiety disorder leads to significant distress and/or dysfunction for the child and family and can develop as early as preschool age. The one-year prevalence rate of this disorder is estimated to be 4% in children (Cartwright-Hatton et al., 2006; Silove et al., 2015). Even if not at a clinical level, children who experience anxiety when separating from parents or caregivers may still experience subjectively high levels of distress that can similarly impact functioning in domains such as school and home.

Around this same period of toddlerhood and early childhood, children may also begin to have strong, specific fears (Beesdo et al., 2009). As children become autonomous and have frightening experiences in the world, there are numerous opportunities for learned fear and anxiety in relation to common objects or situations, such as the dark, thunderstorms, or dogs. Much of this fear is developmentally appropriate and showing some reluctance to engage with a feared object or situation would not be considered pathological. However, when a specific object or situation causes extreme distress and/or active avoidance that persists over time, a child may

be diagnosed with a specific phobia (American Psychiatric Association, 2013). Between three and 6.8% of children are clinically diagnosed with this disorder (Hitchcock et al., 2009). Indeed, fears related to specific objects are considered normative (Beesdo et al., 2009), and many children may suffer from these specific fears yet do not meet full criteria for a diagnosis. From an evolutionary perspective, both of these early manifestations of clinical anxiety can be considered malfunctions of adaptive behaviors; separation anxiety, for example, is present in all mammals (Battaglia, 2015). As children develop and their environments and social systems become more complex, so do the features of their anxiety.

This complexity increases around school age when children shift from primarily interacting with their caregivers in a home environment to facing the potential judgement of teachers and peers in a school setting. Being evaluated by teachers on their academic performance and classroom behavior may create hesitancy or anxiety for some youth. Similarly, peer interactions likely incite some nervousness for most children, as children desire social acceptance; however, some may develop anxiety when interacting with peers, teachers, and/or others that is so severe that it causes active avoidance of social situations. As such, a child with an extreme fear of rejection or negative evaluation may be diagnosed with social anxiety disorder, also known as social phobia (American Psychiatric Association, 2013); this disorder has a prevalence rate of 7% in children and typically has an age of onset between 8 and 15 years (Kessler et al., 2005; Rosellini et al., 2013).

The last major form of clinical anxiety that may be present during this period of early childhood is generalized anxiety disorder, a broader presentation of anxiety characterized by persistent worry across multiple domains such as school, home, and social situations (American Psychiatric Association, 2013). Children with generalized anxiety disorder feel unable to control

their worries and experience associated physiological symptoms, causing disturbances in everyday functioning. Approximately 3% of adolescents are affected by generalized anxiety disorder (Gale & Millichamp, 2016). Yet, since this anxiety is more complex and must be present in multiple areas, the diagnosis of generalized anxiety disorder in childhood is rare, and only around 1% of children are affected (Gale & Millichamp, 2016; American Psychiatric Association, 2013). In their seminal paper, Muris and colleagues (1998) found that approximately 70% of children aged 8-13 in their nonclinical sample reported frequent instances of worry regarding school, health, and social situations that caused some level of interference in their daily functioning. Therefore, both subclinical and clinical levels of anxiety across a variety of domains are linked to childhood distress and impairment.

By tracing child anxiety across development, it is clear that children are not independent actors in their environments but rather are influenced by caregivers, objects (in the case of specific phobias), and peers. However, caregivers are present at the earliest point in a child's life, making them an important first influence on future anxiety. Longitudinal investigations beginning in infancy are therefore important for tracing how anxiety influences, and evolves in response to, caregiver behaviors over time.

Parenting Behaviors and Child Anxiety

From birth, a child is entirely dependent on others for survival. Because of this dependence, caregivers wield a significant amount of control over their infant's early understanding of the world. At about 6 months of age, an infant begins to display behaviors consistent with social referencing or attending to the affect of others in order to inform new situations (Feinman, 1982). If a caregiver reacts with fear or anxiety in the face of an unfamiliar stimulus, an infant is likely to model that same affect (Murray et al., 2008). One study found that

infants between the ages of 12 and 14 months who viewed their mother interacting in a socially anxious way with a stranger were subsequently more likely to react in a fearful and avoidant way with the stranger compared to infants who viewed a non-anxious interaction (de Rosnay et al., 2006). Further, Morales and colleagues (2017) found that infants of anxious mothers spent more time selectively attending to threatening faces compared to infants of nonanxious mothers. Therefore, early manifestations of anxiety in infancy may be directly influenced by observed parental behaviors.

Additionally, infants learn whether or not their caregivers are a secure source of safety and care, creating another potential avenue through which anxious symptomology may be transmitted from parent to child. Within the attachment literature, infants of parents who are insensitive and provide inconsistent care are likely to develop insecure attachment representations (Bowlby, 1973). More specifically, within insecure attachment representations, infants with consistently inattentive caregivers may develop an anxious-avoidant attachment representation, infants with inconsistently sensitive caregivers may develop an ambivalent-resistant attachment representation, and infants with frightened or frightening caregivers may develop a disorganized attachment representation (Bowlby, 1973). Each of these subtypes of insecure attachment have been linked, at varying degrees, to later anxiety. One meta-analysis found a moderate association (r=0.30) between ambivalent-resistant attachment representations and child and adolescent anxiety (Colonnesi et al., 2011). Infants with anxious-avoidant attachment representations are theorized to be less efficient at self-regulation (Verschueren et al., 1996) and view the world as inherently unsafe (Colonnesi et al., 2011). Indeed, using fMRI data, Moutsiana and colleagues (2014) found that infants with insecure attachment representations (anxious-avoidant, ambivalent-resistant, or disorganized) at 18 months of age showed difficulty

up-regulating positive emotion at age 22. Another study found that the presence of either an ambivalent-resistant or anxious-avoidant attachment representation at 15 months of age significantly predicted symptoms of separation anxiety at age 6 (Dallaire & Weinraub, 2005). Taken together, these studies highlight the long-lasting effects that early infant-caregiver interactions can have on later child emotionality and anxious symptomatology.

Moving into early childhood, children begin to explore their environments, necessitating that caregivers set rules and boundaries to encourage appropriate behavior while also fostering independence. There are many ways that parents choose to structure their child's behavior, both implicitly through their emotional reactions to specific behaviors, as well as explicitly through clear instruction. However, some parenting behaviors may contribute to better child outcomes than others. Meta-analyses have implicated two broad parenting dimensions as being particularly influential in the development of child anxiety: rejection and control (McLeod et al., 2007; Rapee, 1997). Rejection refers to parenting that is withdrawn, aversive or hostile, and lacks warmth; control refers to parenting that is over-involved and autonomy-restricting (McLeod et al., 2007). Children of rejecting parents develop perceptions of the world as threatening and themselves as incompetent, eventually coming to expect negative outcomes in their interactions with the world, all of which heighten their risk for anxiety (Bögels & Brechman-Toussaint, 2006).

Parental control, on the other hand, results in decreased self-efficacy in children, primarily by removing opportunities for children to self-regulate and cope with distressing situations, simultaneously communicating that the child is unable to independently manage themselves in the world (Rork & Morris, 2009). There are two types of parental control that have been distinguished in the parenting literature: behavioral control and psychological control.

While behavioral control refers to parenting behaviors that regulate a child's behavior, psychological control refers to attempts to manipulate a child's emotional or psychological experiences (Barber et al., 2005). Many studies, including those referenced above (i.e., McLeod et al., 2007; Rork & Morris, 2009), collapse across these two dimensions, but there is evidence that psychological control is primarily detrimental while behavioral control can differentially predict better outcomes in children, such as reductions in externalizing problem behaviors (Barber et al., 2005).

While parental rejection and control have long been the focus of studies assessing parenting behaviors and child anxiety, both broad dimensions have displayed consistently small effect sizes (McLeod et al., 2007). However, meta-analyses have indicated that these effect sizes significantly change after expanding these broad parenting dimensions into various sub-dimensions. Within parental control, for example, increased autonomy-granting behaviors demonstrate a large negative association with child anxiety (r^2=0.18), while increased parental overinvolvement displays a small positive association with child anxiety (r^2=0.05; McLeod et al., 2007). Without delving deeper into parental control and separating it into more nuanced sub-dimensions, the importance of autonomy-granting parenting behaviors remains obscured. For this reason, research in this area is now shifting to focus on more fine-tuned aspects of parenting. One sub-dimension of parental control that is gaining increasing attention in relation to child anxiety is intrusive parenting.

Intrusive Parenting

There is little consensus when defining the term *intrusiveness* within the psychological literature; intrusive has been used synonymously with psychologically controlling, overprotective, overcontrolling, insensitive, and autonomy-restricting (e.g., Graziano et al., 2010;

Biringen & Robinson, 1991; Barber, 2002; Taylor et al., 2013). There is considerable overlap between these terms, and this definitional ambiguity makes it difficult to compare results across studies. Within the developmental literature, intrusive parenting encompasses both verbal and physical behaviors that restrict a child's autonomy and limit a child's actions (Ainsworth et al., 1978; Biringen & Robinson, 1991). Therefore, by this definition, intrusiveness encompasses behaviors that are autonomy-restricting and overcontrolling. Additionally, intrusiveness is typically characterized as a component of psychological control, as parents are not attending to the psychological needs of their children and are rather enforcing their own agenda (Barber, 2002; Becker, 1964).

There are also distinct differences between intrusiveness and its other ostensible synonyms. Parental sensitivity refers to whether or not the parent provides appropriate and consistent responses to a child's needs (Lamb & Easterbrooks, 1981). Therefore, if a parent fails to respond to a child's cries or requests for help, this would be insensitive but not intrusive. Overprotection, like intrusiveness, is inconsistently defined in the parenting literature. A majority of researchers, however, characterize overprotection as stemming from excessive anxiety regarding the parenting role, ultimately manifesting in behaviors that remove a child's autonomy through infantilization and disproportionate concern for a child's emotional state (Holmbeck et al., 2002; Levy, 1943). This affective component of overprotection is what differentiates it from intrusiveness.

Correctly defining intrusive parenting is imperative if we are to understand its consequences on development. For the purposes of this study, and in line with most literature in this area (e.g., Murray et al., 2012; McLeod et al., 2011), we define intrusiveness as parenting behaviors that communicate a lack of regard for a child's autonomy or are unnecessarily

directive and controlling given a child's level of functioning, essentially a combination of the commonly used terms of autonomy-restricting and overcontrolling that falls under the domain of psychological control.

Effects of Intrusiveness in Infancy and Childhood

As early as in infancy, intrusive parenting is linked to negative child outcomes, typically assessed in terms of neurological development or functioning. Intrusive parenting may manifest as more physical in nature during infancy; for example, a caregiver may physically manipulate an infant or object in order to direct the child's actions (e.g., Jones et al., 1997). There is evidence from electroencephalogram data that maternal intrusiveness at 5 months of age may disrupt the development of early attentional processes at a neurological level (Swingler et al., 2017). Preliminary results from recent research indicates that infants of intrusive mothers may display distinct brain activity in response to angry voices compared to infants of non-intrusive mothers, suggesting that these infants may display an attention bias towards threat (Huffmeijer et al., 2020). The anxiety literature suggests that attention bias towards threat is an important mechanism through which anxiety manifests and is maintained in adults as well as youth (Abend et al., 2017). This developmental research suggests that early manifestations of this bias may be visible as early as infancy and may have their roots in intrusive parenting.

Intrusiveness may also serve to harm the parent-child relationship. One study found that maternal intrusiveness at 15 months of age significantly predicted increased child negative affect and reduced child engagement 10 months later (Ispa et al., 2004). Broomell and colleagues (2020) found that the deleterious effects of intrusive parenting may be context specific for infants; greater intrusiveness at 5 and 10 months of age predicted decreased executive function at 48 months of age, only when the intrusive behaviors occurred in the context of an unstructured

task (i.e., free play). This aligns with theoretical conceptualizations of intrusiveness as being harmful when developmentally inappropriate (McLeod et al., 2011).

Overall, intrusiveness appears to be of more interest to researchers studying developmental rather than clinical outcomes, especially in infant and toddler populations. It may be that intrusive parenting is particularly salient during this developmental period, or that constructs such as *autonomy-restricting* and *overcontrolling* take the place of intrusiveness later in development. By tracking maternal intrusiveness, consistently defined, from infancy through middle childhood, the current study elucidates potential factors that make this concept so salient in early development.

Since few clinical studies use the term *intrusiveness*, most evidence for the relationship with child anxiety comes through the associations that link parental control and subsequent child anxiety. Early studies looking at intrusiveness found significant links to adolescents' internalizing symptoms (Baumrind, 1991). Additionally, children aged 7 to 12 whose mothers displayed overcontrolling behaviors had higher levels of anxiety symptoms as well as an increased tendency to perceive ambiguous scenarios as threatening (Affrunti & Ginsburg, 2012). As a sub-dimension of parental control, intrusive parenting has been theorized to have the same effect. Specifically, by interjecting in situations and activities where the child can likely act independently, parents may remove a child's perceived control over their environment (Barber et al., 1994), which itself has been found to be strongly associated with anxiety diagnoses in both children and adults (Gallagher et al., 2014). For intrusive parenting specifically, Wood (2006) reported a link with separation anxiety disorder in children aged 6 to 13. The literature linking parental control and intrusiveness with child anxiety consists mainly of cross-sectional studies, limiting the conclusions that can be drawn about the directionality of these effects. The current

study aims to address this critical gap in the literature by analyzing longitudinal associations between intrusiveness and child anxiety symptoms across early development.

Evidence for Bidirectionality

While most literature on intrusiveness assumes that it is a causal factor for child anxiety, there is evidence that child anxiety may elicit intrusive behavior from parents. Seminal research in developmental psychology has demonstrated that an infant's early temperament can affect how a parent interacts with their child (Belsky, 1984). Infants with a difficult temperament, characterized by negative mood and behavioral inhibition in novel situations, for example, elicit parenting that is overcontrolling and negative (e.g., Lengua & Kovacs, 2005; Belsky, 1984). When parents react to a difficult child with controlling parenting and inconsistent discipline, this in turn predicts increases in child negative emotionality above and beyond baseline levels (Micalizzi et al., 2017; Lengua & Kovacs, 2005). Given that studies consistently link difficult temperament and behavioral inhibition to the development of anxiety disorders (see Pérez-Edgar & Fox, 2005 for review), a similar bidirectional relationship may exist between intrusiveness and anxiety.

Not only are children with a difficult temperamental profile more likely to elicit intrusive behavior from their parents, they might also be more susceptible to its detrimental effects. For example, intrusive parenting behaviors are a particularly salient link to later anxious behaviors for children with an average to low resting heart period (interval between heart beats) in infancy, which is a biological indicator of high levels of fear (Wagner et al., 2016). However, it was unclear from this study's design whether the intrusive parenting itself could have been evoked by the child's greater baseline levels of fear. In line with this directionality, one study found that mothers interacted with anxious children in a way that was significantly more involved

compared to interactions between the same mothers and nonanxious children (Hudson et al., 2009).

Given the evidence that intrusiveness may be linked to later child anxiety, which itself is linked to increases in intrusive parenting, there may be a cyclical process occurring throughout development. No studies, to our knowledge, have yet to test this specific, bidirectional association, leaving a gap in our understanding of how intrusive parenting and a child's anxious behaviors may co-develop over time.

Current Study

The current study uses a seven-wave longitudinal design, spanning from infancy to middle childhood (ages 5 and 10 months; 2, 3, 4, 6 and 9 years), in order to elucidate the ways in which intrusive parenting may influence child anxiety symptoms, as well as the ways that child anxiety symptoms may predict increases in future intrusive behaviors. The focus on intrusiveness allows us to discern whether there are unique effects associated with this sub-dimension of parental control. By allowing for and testing bidirectional pathways between parent and child, we identify naturalistic processes that occur during the early years of life.

Hypotheses

We hypothesize that: (1) maternal intrusiveness at 5 months will predict intrusiveness at 10 months, intrusiveness at 10 months will predict intrusiveness at age 2 years, and intrusiveness at age 2 years will predict both intrusiveness and anxiety at age 3 years (see Figure 2); (2) there will be positive, bidirectional and concurrent relationships between child anxiety and maternal intrusiveness from ages 3 to 9 years (see Figure 3).

CHAPTER THREE: MATERIALS AND METHODS

Participants

Participants are a community sample of 218 mother-infant dyads (50.5% female infants; all biological mothers) recruited from western Virginia and central North Carolina. Recruitment targeted healthy infants, and any infants with developmental or medical complications, including neonatal abstinence syndrome, were excluded from participating. Dyads were two cohorts involved in a broader longitudinal study assessing cognition and emotion across early development. The third cohort in this larger study did not have a 6 year visit, and it is commonly excluded in published work using these data (i.e., Helm et al., 2019). The inclusion of cohorts corresponds to renewed funding for the broader longitudinal study, allowing for continued recruitment. Each location recruited approximately one half of the total sample using identical methods including advertisements, fliers, and mailing lists. Due to attrition, only participants who had at least four visits across all time points were included in the current study (approximately 77 percent of the total sample).

At the first visit, infants were on average 5 months of age (M=162.19 days, SD=6.97 days). Participant demographics are representative of both locations, and complete information for the sample at the first and last time points can be found in Table 1; dyads at the first and last visits did not differ significantly on key demographic variables (see Table 1). Participants lost to attrition either could not be located, moved out of the area, declined participation, or did not respond to requests to participate.

Procedures

Research assistants at both locations were trained on the same research protocol and procedures for data collection. The visit description below was identical at each of the

recruitment sites. All research procedures were approved by the respective Institutional Review Boards. Mothers were given $20 for the completion of each visit, and children received a small toy.

At all visits, research assistants obtained informed consent and reviewed all task procedures with the mothers. Mothers completed various questionnaires regarding her child's behavior and development, including the Child Behavior Checklist beginning at age 3 years (see Measures). Mothers also completed various tasks with their child at each visit depending on age (see Figure 1 for visual representation). These tasks have been used in previous studies to assess parent-child interactions (i.e., Stevenson-Hinde & Shouldice, 1995; Deater-Deckard & Petrill, 2004). Additionally, these tasks were determined to be sufficiently structured to allow for the observation of maternal behaviors of interest, and published studies using these data also used these tasks to assess maternal intrusiveness (i.e., Perry et al., 2018; Helm et al., 2019). Although the length of these tasks was relatively brief (a maximum of six minutes and a minimum of two minutes), these lengths are rather typical of commonly used parent-child interaction tasks (e.g., Ginsburg et al., 2006; Wilson & Durbin, 2012). All tasks were recorded and later coded in 30 second epochs by coders trained to reliability (see Measures).

Tasks

Free Play

The free play task occurred at ages 5 and 10 months; this task was identical at both time points. Mothers and infants were brought to a room containing various age-appropriate toys. A trained research assistant instructed the mother to play with her infant as she normally would at home. Mothers and infants were allowed to play for two minutes.

Peek-a-Boo

Dyads also completed a peek-a-boo task at the 5 and 10 month visits, and this task was identical at both time points. During the peek-a-boo task, mothers and infants were brought into a room, and mothers were then instructed to use their hands or a provided cloth to cover her own eyes and play peek-a-boo with her infant for two minutes.

Puzzles

Puzzle tasks were administered at the ages 2, 3, and 4 year visits. The procedure for this task was identical across all three visits, but the exact puzzle that dyads completed varied to be developmentally appropriate. Dyads were instructed to work together to complete two jigsaw puzzles. Mothers were instructed to work with her child as she normally would at home. Dyads were given three minutes to complete each puzzle together, for a total of six minutes.

Etch-a-Sketch

At ages 3, 4, and 6 years, participants completed an Etch-a-Sketch task (Stevenson-Hinde & Shouldice, 1995). The procedure for this task was identical across all three visits; however, the images that the mother and child completed varied to be developmentally appropriate. For earlier ages, dyads completed an image of a square and a circle. Later ages completed images of a square and a house. Dyads were given an Etch-a-Sketch toy and mothers were instructed to work with the child (each controlling one knob) to replicate two separate images that increased in difficulty. Dyads were given up to two minutes to replicate the easier image and up to three minutes to replicate the more difficult image, for a total of five minutes.

Marble Maze

At the age 6 and 9 visits, dyads completed a marble maze task (Deater-Deckard & Petrill, 2004) that was identical at both visits. Mothers were instructed to help their child navigate a

marble through a maze. Similar to the Etch-a-Sketch task, the mother and child each controlled a separate knob that either moved the maze vertically or horizontally, and the goal of this task was to maneuver a small ball through the maze and into a hole at the end. Dyads were given up to three minutes to complete the maze.

Measures

Child Behavior Checklist

At ages 3, 4, 6 and 9 years, parents completed the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), a parent-report measure that identifies problem behaviors. Parents completed either the CBCL/1½-5 or the CBCL/6-18, depending on the child's age at the time of assessment.

CBCL/1½-5. The CBCL/1½-5 contains 99 items that assess for potential problem behaviors in children. Parents rate each item as it describes their child on a 3-point scale from 0 – Not True to 2 – Very True or Often True. The CBCL/1½-5 contains three broad scales: Internalizing, Externalizing, and Total Problems. Test-retest reliability of this form is good (r=0.85; Achenbach & Rescorla, 2001), and multiple studies have established its construct validity (e.g., Ha et al., 2011; Ivanova et al., 2010).

CBCL/6-18. The CBCL/6-18 assesses for similar problem behaviors as the CBCL/1½-5, but it contains 113 items because of the inclusion of age-relevant statements regarding alcohol and drug use. As with the CBCL/1½-5, each behavior is rated on the same 3-point scale. The CBCL/6-18 contains the same three broad scales as the CBCL/1½-5: Internalizing, Externalizing, and Total Problems. Test-retest reliability of this form is slightly higher (r=0.88), and it has good internal consistency (Cronbach's α=0.80; Achenbach & Rescorla, 2001), in addition to well-established construct validity (Achenbach & Rescorla, 2001).

CBCL and Anxiety. For the purposes of this study, we measured child anxiety using the Internalizing subscale (CBCL-INT). For the CBCL/6-18, the CBCL-INT subscale has been shown to successfully differentiate youth with and without an anxiety disorder diagnosis (Aschenbrand et al., 2005). Additionally, this subscale shows consistent, fair ability to predict any anxiety diagnosis in youth (AUC=0.62; Read et al., 2015). The CBCL/1½-5 has also been found to be a fair predictor of general anxiety symptomology for preschool aged children (de la Osa et al., 2016). It should be noted that the CBCL in general is a poor predictor of specific anxiety diagnoses, but it has the capability to consistently identify elevated symptoms of anxiety (see Read et al., 2015). As this study is only focusing on anxiety symptomology and not anxiety diagnoses, the CBCL is an appropriate measure.

While the CBCL-INT scale also measures depressive symptoms, Petty and colleagues (2008) found that depression is actually better predicted by CBCL-Externalizing scores (β=0.10) rather than Internalizing scores (β=-0.01), while anxiety is best predicted by the Internalizing scores. Additionally, compared to the Anxious/Depressed subscale, the newer DSM-oriented Anxiety Problems subscale has not shown improvement in the ability to discriminate between children with and without an anxiety disorder (Read et al., 2015). Similarly, using the CBCL-INT allows us to best capture a wide range of anxiety symptoms, as symptoms of social phobia are associated with elevations on the Withdrawn subscale, which is not included in the Anxious/Depressed subscale but is included on the Internalizing subscale (Aschenbrand et al., 2005). Finally, comorbid anxiety and depression symptoms are very common in children and adolescents (e.g., Biederman et al., 1995; Wadsworth et al., 2001), and latent class analyses using the CBCL have failed to find pure anxiety or depression classes, only classes with a mixture of both symptoms (Wadsworth et al., 2001). Therefore, since no CBCL anxiety subscale

likely captures pure anxiety, we believe using the CBCL-INT allows us to capture the best range of anxiety symptoms.

Since both forms of the CBCL are represented in the data, we used standardized scores for all analyses to account for the differences in questionnaire versions. Reliability of the CBCL-INT scale in this sample is good (3 years, α=0.80; 4 years, α=0.86; 6 years, α=0.82; 9 years, α=0.83).

Behavioral Coding

Maternal behaviors were coded using a coding scheme first developed by Fish and colleagues (1991) to measure mother-infant interactions and later adapted for use in toddler and child samples (Shapiro & Mangelsdorf, 1994; Calkins et al., 2004; Smith et al., 2004). Reliability was ensured between the two sites by having trained coders from the Virginia site periodically code between twenty and thirty percent of the videotaped interactions from the North Carolina site.

Intrusiveness. Intrusiveness is defined by the coding scheme as mother-centered interactions that fail to consider the interests of the child. Maternal intrusiveness was coded on a 4-point scale, from 1 – None to 4 – High. Low scoring mothers display no to few instances of intrusive behavior, while high scoring mothers are consistently intrusive throughout the interaction. Examples of intrusive behavior include failing to modulate behaviors that the child turns away from or expresses negative affect to, providing a continuous barrage of stimulation that overwhelms the child, not allowing the child to control the pace of the task, taking away objects or shifting the focus of the task before the child is ready, or physically grabbing or moving the child. As mentioned previously, intrusiveness may appear more physically at earlier ages, but intrusiveness functions similarly to psychological control here by minimizing the

importance of a child's experiences and asserting the mother's experiences as more important. Intrusiveness is unlike psychological control here in that it does not include using tactics such as guilt-induction as a way to manipulate the child. An overall intrusiveness score was calculated at each timepoint for each mother by creating an average of the mother's intrusiveness values for each epoch across all tasks. If only one task was given at a certain timepoint, the intrusiveness score was calculated as the average of the mother's intrusiveness values for each epoch. Inter-rater reliability for intrusiveness was good for all tasks at all time points (ICC's ranging from 0.80-1.00).

Data Analytic Plan

We first assessed the intrusiveness and CBCL-INT data for normality at all time points by analyzing histograms and coefficients for skewness and kurtosis. Based on initial examination of the data, as well as previous experience with this variable, maternal intrusiveness was significantly right-skewed and kurtotic at all time-points and resistant to common transformations for this type of distribution. Therefore, maternal intrusiveness was coded as a binary variable for all statistical analyses. Mothers with an average intrusiveness score of 1 (showed no instances of intrusiveness across tasks) were coded as a 0, and mothers with an average intrusiveness score greater than 1 (showed some instances of intrusiveness) were coded as a 1.

Based on the level of attrition in this data (see Table 2), we used multiple imputation (MI) to estimate the missing data across all timepoints. In practice, MI creates a number of simulated datasets where missing data has been replaced with plausible values drawn from a predictive distribution, allowing for unbiased parameter estimates (Graham et al., 2007). Even though there is a relatively large proportion of missing data in this sample, MI can still produce

unbiased results (Madley-Dowd et al., 2019). One assumption of MI, however, is that data are missing completely at random (MCAR) or missing at random (MAR), which we confirmed by running Little's MCAR test (X^2=62.95, p=.407).

Next, we computed descriptive analyses and correlations for study variables and demographic characteristics (see Table 3). Based on previous literature indicating that maternal education significantly influences both parenting behaviors (e.g., Fox et al., 1995) and anxiety symptoms (Zhang, 2014), we included it as a covariate in all analyses.

To test our first hypothesis, we ran three logistic and one linear regression, controlling for maternal education in all, using MPlus Version 8.1 (Muthén & Muthén, 2017): (1) intrusiveness at 5 months predicting intrusiveness at 10 months, (2) intrusiveness at 10 months predicting intrusiveness at 2 years, (3) intrusiveness at 2 years predicting intrusiveness at 3 years, and (4) intrusiveness at 2 years predicting child anxiety at age 3.

In order to assess for bidirectionality and concurrent relationships, our second hypothesis, we ran a four-wave autoregressive cross-lagged panel model (Kessler & Greenberg, 1981; see Figure 3), a type of structural equation model, in MPlus version 8.1. We also controlled for maternal education at each timepoint. This model allows the assessment of reciprocal relationships over time, as well as the ability to identify causal predominance (Kearney, 2017). By including both autoregressive and cross-lagged effects, we were able to control for preceding measurements of each construct in order to dispel the possibility that significant effects were simply a result of the variables being correlated at the previous timepoint. Due to the transformation of intrusiveness into a binary variable, we used the weighted least square mean and variance adjusted (WLSMV) estimator in MPlus while running these analyses, as it is a robust estimator and therefore does not assume normality (Brown, 2006). We allowed all model

parameters to be freely estimated and assessed model fit. Good model fit was determined by non-significant chi-square tests of model fit (X^2), comparative fit index (CFI) values of greater than or equal to 0.90, root mean square error of approximation (RMSEA) values of less than or equal to 0.06, and standardized root mean square residual (SRMR) values of less than or equal to 0.05 (Hu & Bentler, 1999).

CHAPTER FOUR: RESULTS AND DISCUSSION

Results

Descriptive Analyses

Means, standard errors, and proportions for the study variables are presented in Table 3. Average CBCL-Internalizing scores appeared to be significantly below the clinical cutoff score of 70 at all timepoints, which is typical in community samples. The proportion of mothers displaying some intrusiveness was relatively high at early ages (.80-.70), but significantly dropped to 0.45 at age 4 and remained low thereafter. Zero-order correlations were calculated in order to inspect relationships among variables (see Table 3). CBCL-INT scores were significantly correlated at all timepoints, while intrusiveness scores were correlated primarily at earlier timepoints, with some exceptions. CBCL-INT scores and maternal intrusiveness were positively correlated at age 3 years, and maternal intrusiveness at age 2 years was negatively correlated with CBCL-INT scores at age 6. Child gender was only related to CBCL-INT scores at age 3 years and intrusiveness at age 6 years. Maternal race was negatively related to CBCL-INT scores at age 4 years and intrusiveness at age 2 years. Maternal age was negatively related to CBCL-INT scores at most timepoints, as well as intrusiveness at age 5 months. Maternal education level was negatively correlated with maternal intrusiveness at most timepoints, as well as with CBCL-INT scores at age 3.

Primary Analyses

In order to address our first hypothesis, that maternal intrusiveness would remain stable from 5 months to age 3, as well as predict child anxiety symptoms at age 3, we ran a set of regression analyses, controlling for maternal education level (Table 4). Logistic regression pathways showed that mothers who displayed some intrusiveness at 5 months were 1.33 times

more likely to display some intrusiveness at 10 months (p=0.016). Also, mothers who displayed some intrusiveness at 10 months were 2.62 times more likely to display some intrusiveness at age 2 years (p=0.016). However, displaying some intrusiveness at age 2 did not significantly predict either intrusiveness or children's CBCL internalizing scores at age 3.

Our second hypothesis predicted concurrent and bidirectional effects between maternal intrusiveness and child anxiety symptoms from age 3 to age 9 years. The hypothesized bivariate model fit the data very well (X^2=14.57, df=12, p=0.266; RMSEA=0.03; CFI=0.99; SRMR=0.03; see Figure 2/Table 5 for full model). Over time, CBCL-INT scores remained relatively stable, as scores at each time point significantly predicted subsequent scores at the next time point. Intrusiveness was similarly stable with one exception; while intrusiveness group membership was stable from age 4 years to age 6 and from age 6 to age 9, intrusiveness at age 3 years was not related to intrusiveness at age 4. There were no significant concurrent or prospective relationships between intrusiveness and CBCL-INT scores at or across any two time points.

Discussion

The main purpose of this novel study was to trace maternal intrusiveness consistently from infancy to middle childhood, as well as to elucidate any naturalistic processes that co-occur between intrusive parenting and child anxiety symptomatology. Our findings highlight the fact that maternal intrusiveness group membership was relatively stable from 5 months to 9 years of age, with one exception between 3 and 4 years of age. Additionally, maternal intrusiveness was not related to anxiety symptoms at any timepoint.

While there are few studies that assess the stability of maternal intrusiveness over time, early work on the stability of parenting behaviors suggests that parental control generally remains stable across time (Holden & Miller, 1999). Similarly, child-report measures of

parenting such as the Parental Bonding Instrument have also demonstrated stability in maternal overprotection (a subdimension of control) over a span of 20 years (Wilhelm et al., 2004). The stability of this construct suggests that maternal intrusiveness may not be particularly affected by changes in a child's emotionality, but rather may be an established parental characteristic. Alternatively, it may be that a child's influence on intrusive behavior begins and persists from an earlier timepoint at which we did not have a measure of child anxiety.

An additional finding of this study was that the proportion of mothers displaying some intrusiveness dropped considerably at the later time points. Specifically, this decrease occurred between the age 3 and age 4 year visits, potentially explaining why intrusiveness was not stable across these ages. The tasks completed by mothers at these two time points were identical, eliminating the possibility that this was caused by specifics of the task.

This decrease in intrusiveness suggests that our current definition of intrusiveness may not accurately map onto parenting behaviors displayed later in development. As we used a consistent definition of intrusiveness across all of our time points, and this definition is commonly used by developmental psychologists (Fish et al., 1991; Shapiro & Mangelsdorf, 1994; Calkins et al., 2004; Smith et al., 2004), it is unlikely that we are measuring intrusiveness incorrectly. Rather, our current definition may be a better fit for earlier interactions between parents and their infants and toddlers, but inadequate to identify the ways that intrusive parenting may manifest differently in early to middle childhood. Specifically, as mentioned previously, early manifestations of intrusiveness appear to center around physical direction and manipulation (Jones et al., 1997). Therefore, because our definition continues to encompass these physical behaviors at later ages, we may be measuring behavioral control, which is actually linked to decreases in internalizing symptoms over time (Pinquart, 2017). While psychological control

was still measured in our coding scheme through the inclusions of interactions that communicate that a child's experiences hold less weight than those of the mother, the way that this is communicated may become more subtle in childhood compared to obvious physical manipulations in infancy. It will be important for future research to elucidate how intrusive parenting may manifest differently across child development, rather than assuming that it is static over time.

Our hypothesis that there would be both concurrent and cross-lagged bidirectional effects between maternal intrusiveness and child anxiety symptoms was not supported. This could be due to the limited range of situations in which intrusiveness was coded in the laboratory. Meta-analyses have revealed that the strength of the association between intrusiveness and child anxiety is strongest when using self-reported intrusiveness compared to lab-observed intrusiveness (McLeod et al., 2007). Therefore, our current behavioral measures of intrusiveness may suffer from a lack of external validity, as there are likely a wide range of domains in a child's life in which a parent may be intrusive, many of which were not captured by our task-based interactions. In addition, other studies examining maternal intrusiveness and child anxiety longitudinally have also failed to find prospective relationships, suggesting that maternal intrusiveness may have a maintenance effect on child anxiety rather than a causal effect (Cooper-Vince et al., 2013). It's possible that our failure to replicate past research showing cross-sectional relationships between intrusiveness and anxiety (Wood, 2006; Affrunti & Ginsburg, 2012) is due to the low levels of clinical anxiety in the current sample. Lastly, considering previous work showing that child anxiety may elicit intrusive behaviors, it will be important that future longitudinal work in this area incorporate measures of anxiety at earlier time points in order to

capture any earlier relationships between these constructs that were beyond the scope of the present study.

The current study has limitations that should be noted. Primarily, the dichotomization of maternal intrusiveness significantly reduced the information available to us regarding this behavior. As many mothers within the "some intrusiveness" group displayed only a few instances of intrusiveness, it may be that low levels of intrusive parenting are not harmful for a child's emotional development and that is why we observed few significant relationships between the two constructs. However, the need to dichotomize intrusiveness is revealing in and of itself. Intrusiveness has been consistently linked to child anxiety, yet researchers frequently have trouble observing it in a normally distributed manner in research settings. New laboratory tasks are needed in order to elicit a spectrum of intrusive behavior, similar to what is found in self-report measures. Researchers cannot rely on self-report measures alone to assess these behaviors; the reliance on a single method of data collection, termed common method variance, can cause inflations or deflations in correlations present in the data, threatening study validity (Reio, 2010). Without accurate behavioral measures of intrusiveness, utilizing multiple methods in this area of research will continue to fall short in capturing naturalistic processes that occur during child development.

An additional limitation in the current study was that data were collected from a community sample, so the rates of children with clinical levels of anxiety were quite low. Our sample was also not particularly diverse, as mothers were predominantly white and highly educated. Therefore it is not clear to what extent these results would generalize to other demographic groups. Similarly, we did not have a measure of anxiety at the earlier time points so we were not able to assess whether anxiety in the initial years of life might predict later increases

in maternal intrusiveness. Finally, although the CBCL-Internalizing subscale has been found to be reliable in identifying children with anxiety disorders, we did not have a dedicated measure of anxiety. Therefore, child symptoms of depression may have obscured relationships that are specific to anxiety.

Despite these limitations, our study has considerable strengths. First, our use of a seven-wave longitudinal design allowed us to test for temporal precedence and causal relationships. Additionally, this study was the first, to our knowledge, to consistently trace intrusiveness across infancy into middle childhood. The significant time span coupled with our consistent definition of intrusiveness brought to light the ways in which our current conceptualization of this parenting behavior may fail to capture normal variation across development.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

In summary, our study is one of few that have longitudinally examined relationships between maternal intrusiveness and child anxiety. The fact that there was a significant decrease in observed intrusiveness around the preschool age, despite relative stability across other time points, suggests that the field's current definition of this parenting behavior may be better suited for early dyadic interactions and fall short when it comes to interactions later in development. Rather than focusing on physical intrusions, future research should consider the ways in which intrusiveness may manifest more subtly in early to middle childhood. By pulling from self-report parenting measures that seem to more robustly capture the occurrence of intrusive parenting, we may be able to create more precise definitions to use in behavioral coding schemes. Additionally, current lab-based tasks may be insufficient to capture intrusive parenting at the same frequency as it occurs in the real world. Specifically, intrusiveness in early childhood may present as overcontrol relating to a child's school work, friendships, and home routines. Tasks such as completing puzzles or mazes may not be representative of daily interactions between mothers and their older children that elicit intrusiveness.

Moving forward, we recommend that researchers continue to fine-tune and potentially rethink the current definition of intrusiveness, particularly as it pertains to early and middle childhood. Future studies would benefit from assessing behaviorally-observed, parent-reported, and child-reported intrusiveness in order to assess whether there are substantial differences in the levels of intrusiveness observed inside versus outside of the lab. Using an in-vivo methodology such as ecological momentary assessment would be one potential avenue for assessing intrusiveness as it occurs in naturalistic settings. Overall, our study adds important information to the existing body of research on maternal parenting behaviors and their associations with anxiety

symptoms in children, emphasizing the need to create conceptual definitions that can adequately span across developmental periods.

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APPENDIX

Table 1
Comparison of Sample Demographics at First and Last Time Point

	5 Month Visit (*n*=207)	9 Year Visit (n=177)	
	M (SD)	*M (SD)*	*F*
Mom Age (at 5-month visit)	39.04 (6.10)	39.14 (6.30)	0.01
			X^2
Child Sex			0.39
Male	48.8%	52.0%	
Female	51.2%	48.0%	
Mom Race			0.87
White	81.6%	80.2%	
Black or African American	15.5%	15.3%	
Multi-Racial/Other	1.9%	2.8%	
Asian	0.5%	1.1%	
Native Hawaiian/Other	0.5%	0.6%	
Mom Education Level			0.95
Grade School	0.0%	0.0%	
Some High School	3.1%	2.7%	
High School Graduate	5.0%	5.4%	
Some College/2-Year College Degree	26.7%	25.5%	
Graduate of 4-Year College	38.5%	35.6%	
Master's Degree	22.4%	26.8%	
PhD, MD or Other Doctoral Degree	4.3%	4.0%	

Note: Participants at first and last visits did not differ significantly on any demographic variables listed.

Table 2

Sample Size at Each Timepoint for Each Variable of Interest

	5 Months	10 Months	2 Years	3 Years	4 Years	6 Years	9 Years
Intrusiveness	207	209	208	204	185	177	177
% Data Missing	*5.0*	*4.1*	*4.6*	*6.4*	*15.1*	*18.8*	*18.8*
CBCL-INT	-	-	-	191	184	195	170
% Data Missing	-	-	-	*12.4*	*15.6*	*10.6*	*22.0*

Note: CBCL not administered until age 3 year visit.

Table 3
Means/Proportions and Correlations for Variables of Interest

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender															
2. Education	-.001														
3. Race	-.06	.19*													
4. Mat. Age	.06	.41**	.16*												
5. INT3	.16*	-.21**	-.13	-.22**											
6. INT4	.06	-.10	-.19*	-.22**	.61**										
7. INT6	.09	-.05	-.12	-.13	.42**	.50**									
8. INT9	.11	.03	-.03	-.22**	.30**	.35*	.58**								
9. INTR 5	-.06	-.09	-.11	-.18*	.01	-.01	.02	.14							
10. INTR10	.01	-.17*	.01	-.11	.04	.11	-.09	-.11	.20**						
11. INTR2	.12	-.18*	-.16*	-.09	.03	.08	-.15*	.02	.14*	.21**					
12. INTR3	-.05	-.17*	-.11	-.13	.18*	.05	.03	.09	.15*	.13	.15*				
13. INTR4	.06	-.20*	-.05	-.09	.08	-.08	-.01	-.12	-.04	.03	-.06	.14			
14. INTR6	.17*	-.09	-.02	-.02	.06	.03	-.01	-.05	.02	.08	.07	.04	.19*		
15. INTR9	.11	-.13	-.03	-.11	.09	.01	-.04	.08	.09	.07	.07	.02	.11	.71**	
Mean/Proportion					48.01	46.97	48.59	51.27	.78	.80	.77	.70	.45	.48	.31
SD					9.03	9.87	9.66	9.28							

Note: *p<.05, **p<.001; Mat. – Maternal; INT – CBCL Internalizing score; INTR – Maternal Intrusiveness. Maternal education coded as: 1= Grade School, 2=Some High School, 3=High School Graduate, 4=Some College or 2-Year College Degree, 5=College Graduate of 4-Year College, 6=Master's Degree, 7= PhD, MD, or Other Doctoral Degree.

Table 4

Logistic/Linear Regression Coefficients Assessing Early Stability of Maternal Intrusiveness

	Unstandardized			Standardized		
	B	SE	90% CI	*B*	p-value	OR
Logistic Regression						
Intrusiveness 10 Months						
Intrusiveness 5	0.93	0.40	(0.28, 1.59)	0.20	0.016	1.33
Education Level	-0.45	0.23	(-0.84, -0.07)	-0.25	0.037	0.43
Intrusiveness 2 Years						
Intrusiveness 10	0.96	0.41	(0.29, 1.64)	0.20	0.016	2.62
Education Level	-0.40	0.21	(-0.75, -0.06)	-0.23	0.043	0.67
Intrusiveness 3 Years						
Intrusiveness 2	0.60	0.36	(0.00, 1.21)	0.13	0.094	1.83
Education Level	-0.35	0.17	(-0.64, -0.07)	-0.20	0.034	0.70
Linear Regression						
CBCL-INT 3 Years						
Intrusiveness 2	-0.01	1.64	(-2.71, 2.69)	0.00	0.998	-
Education Level	-1.75	0.73	(-2.95, -0.55)	-0.21	0.016	-

Note: Intrusiveness was binary coded: 0= none; 1= some intrusiveness observed; Education Level ranged from 1= Grade School to 7= PhD, MD, or Other Doctoral Degree.

Table 5

Unstandardized and Standardized Model Parameters for Final Bidirectional Model (Figure 2)

	Unstandardized				Standardized		
	B	SE	LB	UB	*B*	p-value	R^2
Intrusiveness 3 Years							0.04
Education Level	-0.08	0.07	-0.19	0.03	-0.19	0.070	
Intrusiveness 4 Years							0.11
Intrusiveness 3	0.30	0.24	-0.10	0.69	0.13	0.273	
CBCL-INT 3	0.00	0.01	-0.02	0.02	0.01	0.921	
Education Level	-0.27	0.10	-0.43	-0.12	-0.28	0.002	
Intrusiveness 6 Years							0.08
Intrusiveness 4	0.27	0.13	0.05	0.48	0.27	0.027	
CBCL-INT 4	0.01	0.01	-0.01	0.03	0.07	0.437	
Education Level	0.02	0.11	-0.16	0.20	0.02	0.862	
Intrusiveness 9 Years							0.91
Intrusiveness 6	3.17	1.80	0.22	6.13	0.95	<.001	
CBCL-INT 6	-0.02	0.03	-0.07	0.04	-0.04	0.616	
Education Level	-0.19	0.25	-0.59	0.22	-0.06	0.379	
CBCL-INT 3 Years							0.05
Education Level	-1.75	0.75	-2.98	-0.52	-0.22	0.014	
CBCL-INT 4 Years							0.47
CBCL-INT 3	0.75	0.07	0.64	0.86	0.69	<.001	
Intrusiveness 3	-1.40	1.27	-3.48	0.71	-0.07	0.980	
Education Level	-0.02	0.65	-1.09	1.05	-0.00	0.318	
CBCL-INT 6 Years							0.33
CBCL-INT 4	0.57	0.07	0.46	0.68	0.58	<.001	
Intrusiveness 4	0.51	0.93	-1.02	2.04	0.06	0.583	
Education Level	0.50	0.84	-0.89	1.89	0.06	0.551	
CBCL-INT 9 Years							0.43
CBCL-INT 6	0.65	0.08	0.53	0.78	0.65	<.001	
Intrusiveness 6	-0.23	0.74	-1.44	0.98	-0.03	0.760	
Education Level	0.61	0.61	-0.39	1.62	0.07	0.316	

Note: Linear regression results when outcome is continuous such as CBCL-INT scores, logistic regression when outcome is categorical such as education level; Intrusiveness was binary coded: 0= none, 1= some intrusiveness observed; Education Level ranged from 1= Grade School to 7= PhD, MD, or Other Doctoral Degree.

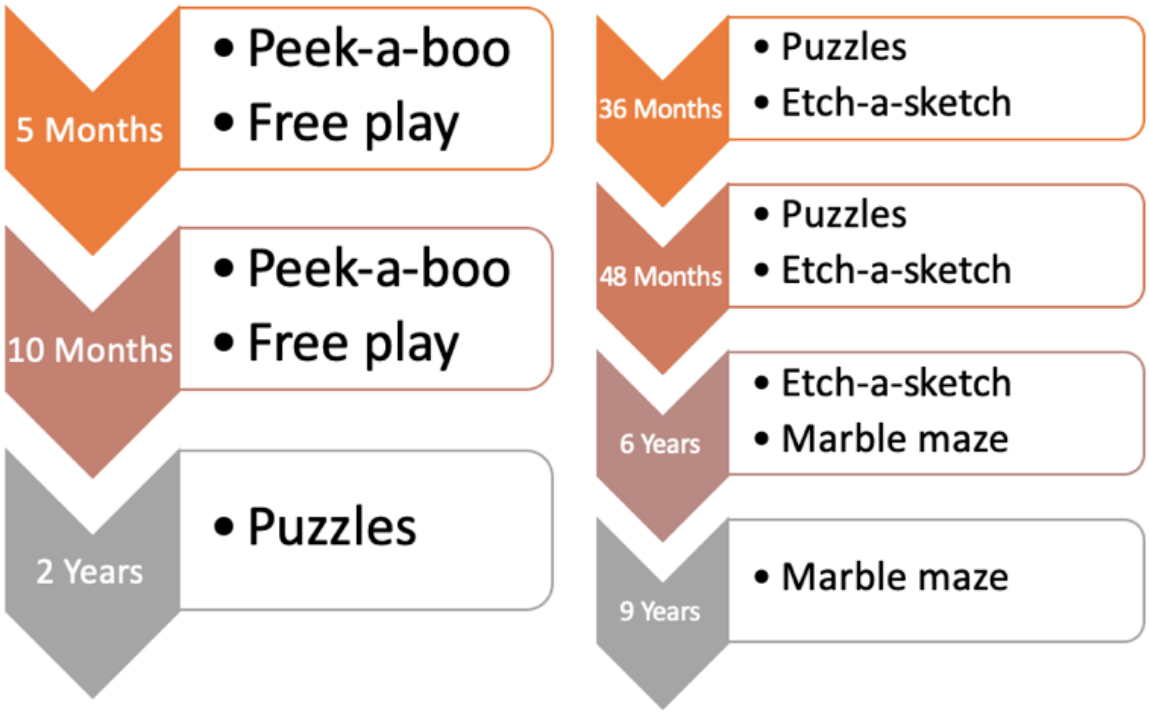


Figure 1. Behaviorally-coded tasks completed at each timepoint.

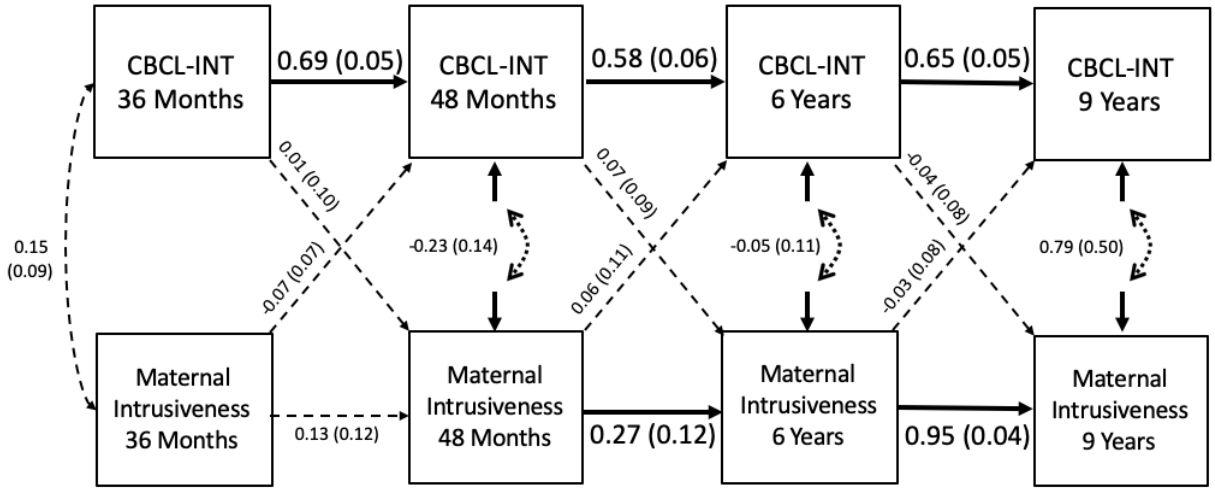


Figure 2. Final model with standardized solutions, controlling for maternal education level at each timepoint. Significant pathways are represented by solid lines; non-significant pathways are represented by dashed lines. Single-headed arrows indicate predictive paths, and double-headed arrows indicate correlated variables.

VITA

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