Expanding Attachment Theory into Preschool: Exploring the Association Between Attachment Security and Maternal Sensitivity

by

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ABSTRACT

EXPANDING ATTACHMENT THEORY INTO PRESCHOOL: EXPLORING THE ASSOCIATION BETWEEN ATTACHMENT SECURITY AND MATERNAL SENSITIVITY

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Previous research has explored attachment theory in infancy and adulthood, but relatively less has focused on the preschool age. Our study aimed to expand a central tenet of attachment theory into the preschool age by exploring the concurrent association between attachment security and maternal sensitivity. Children (N = 100, M age = 45 months) completed a behavioural assessment of attachment security and a measure of maternal sensitivity with their mothers, and a representational assessment of attachment security with an examiner. The association between each measure of attachment security and maternal sensitivity was explored. Overall, behavioural attachment security was moderately associated with maternal sensitivity (r = .18, 95% CI [-.03, .37]; however, representational attachment was not. Additional exploratory analyses aimed at understanding our results were conducted and discussed, along with the need for future research to include consideration of continuous variables and expand beyond the mother-child dyad.
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CHAPTER 1

Introduction

General Introduction

The importance of early attachment relationships to children’s development and well-being has been well-established through robust research findings in both infancy and adulthood. Infants’ secure attachment relationships with their primary caregiver have been repeatedly associated with positive outcomes in later life and personality development. Skills that influence peer relationships, such as emotion regulation (Schore, 2001; Schore and Schore, 2008; Sroufe, 2005) and social skills (Mikulincer & Shaver, 2007) are better developed in children who have secure relationships than children with insecure relationships. Neural (Schore, 2001; Schore & Schore, 2008) and mental health (Fearon et al., 2010; Groh et al, 2012; Madigan, Atkinson, Laurin & Benoit, 2013; Mikulincer & Shaver, 2007) outcomes are also more positive among children with secure infant attachment, illustrating the long-term impact of attachment relationships in later life. Likewise, in adulthood, securely attached individuals have demonstrated more adaptive emotion regulation strategies, and more support-seeking and supportive behaviours toward their partners, than those who with insecure attachment (Cohn et al., 1992; Gao, Crowell, O’Connor & Waters, 1996; Kobak & Hazan, 1991; Mikulincer & Nachson, 1991).

Despite the robust research about attachment theory in infancy and adulthood, the same attention has not been given to attachment relationships in preschool and elementary school-aged children. Although some research has expanded attachment theory into early childhood (for example, Bureau & Moss, 2010; Cassidy, 1988), little has been done with preschoolers. Even
longitudinal research that assesses attachment security in infancy and again in adulthood often does not include an assessment of attachment in childhood (Fraley, 2002). The paucity of research at these core developmental timepoints has created a bottleneck in our understanding attachment across the lifespan (Fraley, 2002). Moreover, associations between theoretical constructs that are central to attachment theory have yet to be demonstrated in the preschool period. The goal of the current study was to expand attachment theory into the preschool age by exploring the association between secure attachment and maternal sensitivity in this under-researched age group.

**Attachment in Infancy**

Typical interactions between infants and caregivers are characterized by cyclical patterns in which infants can use their caregiver as a secure base to explore the world, and alternately as a safe haven to return to for safety and comfort. The attachment relationship between an infant and caregiver is illustrated by the Circle of Security diagram (Figure 1; Cooper, Hoffman, Marvin & Powell, 2000). At the top of the circle, a caregiver is supporting the infant’s exploration of the world around them. At the bottom of the circle, the infant is seeking support from and proximity to the caregiver. The behaviour a child uses to signal their needs to their caregiver is understood as their attachment behaviour. In infancy, four attachment patterns have been identified to describe the relationships between infants and their primary caregivers: secure, insecure-avoidant, insecure-ambivalent, and disorganized. Infants with a more secure pattern of attachment behaviours can use their caregiver as both a secure base from which to explore the world, and a safe haven to return to when in distress. When caregivers are responsive to the needs of their infants, the infants in turn develop an expectation of being loved, cared for, and
effective at influencing their environment. They are successfully able to communicate their needs. Infants with insecure relationships, on the other hand, have not had the same experience with sensitive parenting and therefore exhibit different attachment behaviours than secure infants. When infants in insecure-avoidant relationships are separated from their caregiver, they typically do not show distress, and when reunited, they do not seek physical proximity as secure infants do. Conversely, infants in insecure-ambivalent relationships do tend to seek proximity, but are highly distressed during separations and reunions from their caregiver, and are not easily comforted (Ainsworth et al., 1978). Finally, infants with disorganized attachment patterns show inconsistent and contradictory attachment behaviours suggestive of a breakdown in attachment strategy. For example, they may freeze in the presence of their attachment figure, as if they do not know what to do, or demonstrate contradictory behaviours, such as approaching and avoiding at the same time (Henninghausen & Lyons-Ruth, 2005; Main & Solomon, 1990).
Figure 1: Depiction of the Circle of Security, illustrating the secure base and safe haven of a caregiver of a securely attached child.

These different patterns of attachment behaviour are thought to arise due to infants having to adapt to their environmental context, and caregiver sensitivity is a central part of this context. A sensitive caregiver is one who “notic[es an infant’s signals], interpret[s] them accurately, and…respond[s] to them promptly and appropriately,” (Ainsworth, Blehar & Waters, & Wall, 1978, p.40). For example, a sensitive mother might hear her infant crying, know what her infant needs, and quickly provide relief for her child—this allows the infant to develop a secure relationship with their caregiver. In the case that a mother is not as sensitive, it may be adaptive for an infant to use a different strategy. Infants of mothers who display less sensitivity may learn to exhibit avoidant behaviour, and infants of mothers who are inconsistently
supportive may learn to amplify their attachment signals, displaying ambivalent strategies (Bretherton, 1992). Ainsworth first highlighted the importance of maternal sensitivity in supporting the development of a secure mother-infant attachment relationship (Ainsworth et al., 1978) by documenting how mothers with secure relationships with their infants were ones who displayed greater maternal sensitivity during a prior assessment (Ainsworth et al., 1971). Meta-analytic research supports this relation between maternal sensitivity and attachment security with a moderately strong effect size ($r = 0.27$, Atkinson et al., 2000; $r = 0.24$, De Wolff & van IJzendoorn, 1997; $r = 0.32$, Goldsmith & Alansky, 1987).

**Attachment in Preschool**

As they mature, children develop cognitive and social skills that facilitate nuanced communication and relationship abilities. These established social and communication skills allow for a goal-corrected partnership: a relatively more mature relationship wherein the dyad can work together toward a shared goal (Bowlby 1969/1982; Cicchetti, Cummings, Greenberg & Marvin, 1990; Marvin, 1977; Marvin & Greenberg, 1982). The preschool-aged child can understand the intentions of their caregiver and work together to achieve common goals of proximity and felt security (Cicchetti et al., 1990). Proximity seeking behaviour, a strong indicator of secure attachment in infancy, is less likely to reliably indicate secure attachment in older children (Marvin & Britner, 1999). Rather, their increased autonomy often permits greater physical distance, and their advanced verbal abilities allow communication of their needs to become more specific, and more nuanced. Therefore, although achieving the same basic purpose, the secure base behaviour of a preschool aged child functionally changes with increased abilities.
There are two general methods to assess attachment relationships in preschool-aged children. The first infers the quality of an attachment relationship through behaviourally observing caregiver-child interactions. This method adapts the Strange Situation Paradigm (SSP; Ainsworth et al., 1978) and what is known about attachment in infancy, extending it forward developmentally to the preschool age. The SSP is a laboratory-based procedure for assessing attachment security in infants. It involves eight episodes, including two separations and reunions from the attachment figure, and episodes where both their attachment figure and a stranger are present. Classifications assigned for preschool-aged children are similar to those assigned in infancy. Securely attached children show positive interactions with their caregivers both when initiating and responding to attention from their caregivers. Children with insecure-avoidant relationships with their caregiver avoid initiating and responding to their caregivers; however, this avoidance is more subtle than avoidant infant behaviour, and may appear somewhat positive, albeit emotionally detached. Those in an insecure-ambivalent relationship with their caregivers may be resistant or fussy. The disorganized attachment category undergoes the greatest behavioural shift from infancy to preschool. Fewer children are categorized as overtly disorganized, demonstrating inconsistent or contradictory behaviours. Rather, controlling attachment patterns are observed, involving strategies to maintain attention from caregivers that can be manipulative (Main & Solomon, 1986). A controlling punitive attachment pattern is characterized by strategies that are intimidating or humiliating for the caregiver, and a controlling-caregiving attachment pattern by role-reversal and caretaking behaviour toward caregivers. They scaffold interactions with their parents in an age-inappropriate way by organizing interactions and providing positive social reinforcement, essentially taking on the role
of a caring adult in the interaction (Henninghausen & Lyons-Ruth, 2005). At the preschool age, modified SSP protocols try to account for the developmental differences in these more advanced children. They typically include only four episodes, where the preschooler is separated from their caregiver for a longer period of time (Solomon & George, 2016; Cassidy et al., 1992). The child’s behaviour during the modified SSP is then coded using a number of different coding systems: the most commonly used systems are the Preschool Attachment Classification System (PACS; Cassidy et al., 1992) and the Preschool Assessment of Attachment (PAA; Crittenden, 1994).

The second method of assessing attachment in preschool is through children’s representations of attachment relationships using symbolic tasks. Bowlby (1973) originally theorized that children develop mental representations, or internal working models (IWMs), through their interactions with primary caregivers. Infants learn about themselves, their caregivers, and the world around them from their experience cuing support from the environment, and their caregiver’s responsiveness to those cues (Ainsworth, Blehar, Waters & Wall, 1978; Bowlby, 1973). As with behavioural assessments, an infant with a secure internal working model will have learned that they can effectively seek out their caregiver when distressed, and that their parent will respond in a timely and effective way to help them feel better. The internalized expectation of this interactive process, and its broader implications for their overall relationship, comprises the infant’s IWM of attachment. As they are relatively stable, IWMs guide both an individual’s behaviour toward important others, and their interpretation of others’ behaviours, across the lifespan (Bowlby, 1969; 1982; Bretherton & Munholland, 2016; Fraley, 2002). Attachment IWMs are assessed through a range of
representational tasks that elicit projective narrative and descriptive information from children through a number of different approaches. For example, children’s family drawings (Main, Kaplan & Cassidy, 1985), standardized picture cards (Klagsbrun & Bowlby, 1976), and standardized doll-play story stems have all been used. Doll-play story stem measures involve presenting a child with a story-stem to complete through the use of dolls and a play house and include the Attachment Story Completion Task (ASCT; Bretherton, Ridgeway, & Cassidy, 1990), the Manchester Child Attachment Story Task (MCAST; Goldwyn, Stanley, Smith & Green, 2000), the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim et al., 1990), and the Attachment Doll Play Assessment (ADPS; George & Solomon, 1990, 1996, 2000; see Solomon & George, 2016).

What do we know about Attachment in Preschool?

In order to develop our understanding of attachment processes at the preschool age, it is necessary to study the concordance between behavioural and representational measures of attachment security, and their relation to central theoretical correlates of secure attachment. There are few examinations of the concordance of representational and behavioural assessments of attachment patterns in childhood. Of these, only one has compared attachment behaviour patterns specifically during preschool age. Through a small sample of 29 preschoolers aged 37-54 months, Bretherton and colleagues found strong concordance between dichotomous secure versus insecure classifications on PACS and ASCT, but no concordance for different types of insecurity (Bretherton, Ridgeway & Cassidy, 1990). This pioneering study could be considered exploratory: future research would benefit from including a larger sample size. Attachment researchers have explored the convergence between representational and observed attachment
behaviours using another measure of attachment security, the Attachment Q-sort (AQS), and results have been variable. The AQS involves observing naturalistic dyadic interactions (Waters & Deane, 1985) and organizing cards that describe behaviours based on how representative they are of the child’s behaviours. It was developed for assessing attachment security in infants, and on occasion has been used with no changes in research with preschool children. Initially, meta-analytic findings revealed a modest association (van IJzendoorn et al., 2004), but more recently, either no relation was identified between AQS security and secure attachment behaviour (Posada, 2006), or AQS security only accurately differentiated security from ambivalent or disorganized classifications (Moss, Bureau, Cyr, & Dubois-Comtois, 2006).

Other evaluations of the concordance of attachment patterns sampled children at around six years of age. Cassidy (1988) examined the relation between behavioural classifications of reunion behaviours and representational story-stems in 52 six-year-old children. The story stems involved themes of parent-child dyadic relationship, tension or conflict from within the home, and tension or conflict from outside of the home, and children’s narratives were placed in one of three groups: open, avoidant, and hostile/negative. Overall, Cassidy (1988) found that children’s behavioural and representational classifications were likely to match for secure and avoidant children, such that children who were secure on the reunion procedure were more likely to be in the open doll-play category; and children who were avoidant on the reunion procedure were more likely to be placed in the avoidant doll-play category. Less compellingly, children who were controlling were either classified as open or as hostile/negative, and those who were ambivalent were equally likely to be classified in any doll-play group. Another examination of concordance in attachment behaviours and representations found high concordance for 69 six-
year-old children. This involved four-way classifications of attachment behaviour (i.e., secure, avoidant, ambivalent, and controlling) and four-way classifications of attachment representations (i.e., confident, casual, busy, and frightened, respectively) which showed an overall 79% agreement (Solomon, George & DeJong, 1995). Finally, others have investigated the concordance between attachment behaviour and representations at different time points. For example, Bureau and Moss (2010) examined the concordance between attachment behaviour at age six and attachment representations at age eight, finding moderate concordance between classifications (60% overall agreement). While these data provide some support for concordance between attachment behaviour and representation, they still do not address the paucity of research at the younger preschool age.

**Attachment and sensitivity at the preschool age.** Few studies have explored the relation between attachment security and maternal sensitivity at the preschool age. Bureau and colleagues (2017) used a novel laughing task to assess both maternal and paternal sensitivity. Their laughing task assessed how well parents were able to make their preschoolers laugh for two minutes, without the use of any toys, and how sensitive a parent was to their child during the task. With a sample of 107 children, they found that sensitivity of both fathers and mothers was related to behaviour attachment security in preschool-aged children, assessed with the PACS (with mothers $r = .25$, with fathers $r = .35$). While these results are promising, replication in different samples and with different measures will be important to establish the association between sensitivity and security in preschool aged children.

Additional explorations of the association between maternal sensitivity and attachment security typically involve unique or non-generalizable samples. For example, Piermattei and
colleagues (2017) evaluated the relation between attachment representations and maternal sensitivity assessed by the Emotional Availability Scales (EAS; Biringen, 2008). The EAS are a series of scales that assess parent (4 scales; Sensitivity, Structuring, Non-Intrusiveness, Non-Hostility) and child (2 scales; Responsiveness, Involving) interactive behaviour. Each scale is scored on a 7-point Likert scale from 1 (non-optimal) to 7 (optimal). The EAS are widely considered an assessment of parental sensitivity in the preschool age. Piermettei and colleagues’ (2017) sample included 20, 4.5-8.5 year old children who had been adopted within the past 12 to 36 months, and assessed the children’s relation with both their adoptive mother and adoptive father. Overall, children who demonstrated secure relationships with their father had lower parental Non-Hostility scores. A second study examined the relation between maternal sensitivity on the EAS and attachment security on the AQS in 24 children aged 12 to 73 months whose parents had recently divorced or separated (Altenhofen, Sutherland & Biringen, 2010). Here, attachment security was only related to child factors on the EAS, but not measures of parental sensitivity or closely related behaviour. A final study involved 45 boys between 32 and 69 months old with a diagnosis of autism spectrum disorder (ASD; Koren-Karie, Oppenheim, Dolev & Yirmiya, 2009). Here, attachment was assessed behaviourally and coded as either secure, insecure-avoidant, insecure-ambivalent, or disorganized based on Ainsworth’s sensitivity scales (1978) and Main and Solomon’s description of disorganized attachment (1990). Maternal sensitivity was again assessed using the EAS. They found that mothers of secure children were more likely than mothers of insecure or disorganized children to demonstrate sensitivity toward their children, even after controlling for child factors such as their diagnosis, level of functioning, and responsiveness to their mothers. However, this final sample used the infant SSP
and coding scheme due to the developmental age of participants and is therefore not
generalizable to other preschool aged children and outside the scope of the current study.

In summary, the central tenets of attachment theory have not been adequately explored at
the preschool age. The previous review highlights that little is known about attachment in
preschool, and poses many questions for future research. One large area of need in the field is to
replicate the relation between maternal sensitivity and attachment security at the preschool age in
order to extend this central tenet of attachment theory at a different stage in child development.

**The Current Study and Hypotheses**

The current study aimed to expand our understanding of attachment theory into the
preschool age by exploring the association between attachment security and maternal sensitivity.
We assessed attachment security, both behaviourally and representationally, and maternal
sensitivity. We expected that secure attachment assessed by both behavioural and
representational measures would be associated with maternal sensitivity, with a correlation of at
least .17. The strength of this correlation is based on the lower bound of the 95% confidence
interval of De Wolff and van IJzendoorn’s (1997) meta-analysis reviewing the relationship
between attachment security and maternal sensitivity in infancy, calculated as recommended by
the University of Guelph Psychology Department Statistical Methods in Theses: Guidelines and
Explanations. Additionally, we will explore the data in order to generate hypotheses for future
research projects.
CHAPTER 2

Method

Participants

Biological mother-infant dyads who participated in the study ($N = 100$, 48 males, 52 females) were part of a larger sequential-longitudinal study conducted at the University of Western Ontario: they resided in the London, Ontario and surrounding communities. Children were 45.31 months old on average when they participated in the visit that comprised the current study ($SD = 1.80$). All dyads were recruited in hospital when their infants were born and agreed to be contacted for future research studies. Half ($n = 50$) were part of a larger group ($n = 78$) who originally participated in a longitudinal study, with six time points starting at three months of age. The other half ($n = 50$) of participants in the cross-sectional sample were also recruited in the London, Ontario area when their infants were born, with the exception of two children recruited from a pre-school located at the University of Western Ontario. They were contacted when children were approximately 3.5 years old and participated in the current and subsequent visits alongside the remaining longitudinal sample. The current study involves data from the fifth timepoint, when children were 3.5 years old.

For household income, 17% of the sample reported an annual income of less than $40,000; 10% between $40,000 and $59,999, 13% between $60,000 and 79,999; and 50% of the sample reported an annual income of greater than $80,000. The final 10% of the sample did not report their annual household income. For maternal education, 6% of the sample reported completing a doctoral or master’s degree; 25% reported completing a bachelor’s degree; 28%
reported completing a college diploma, and 17% reported completing secondary school or an equivalent degree. The remaining 24% did not report their level of education.

**Measures**

**Maternal Behaviour Q-Set – Preschool** (MBQS-Preschool; Pederson, Bailey, Bento, Xue, & Moran, 2013; Pederson & Moran, 1995): The MBQS-Preschool is a revised version of the well validated MBQS (Pederson & Moran, 1995). A subset of items from the MBQS that were no longer relevant or not observed at the preschool age were removed or modified to be suitable for the 3.5-year timepoint. For example, where the MBQS includes “mother scolds or criticizes baby”, the MBQS-Preschool includes “mother annoyed, irritated, or impatient with child”. While the former was not observed in preschool dyads, the latter was, and was deemed to illustrate the construct of rejection in a more developmentally appropriate way. The revisions were also informed by Brown’s Preschool MBQS (n.d.; also a 90-item MBQS). The full list of MBQS-Preschool items is listed in Appendix D.

The MBQS-Preschool measures maternal sensitivity in both naturalistic and lab-based settings. Trained observers describe the parent’s interactive behaviour by ranking twenty-five items that describe a variety of discrete sensitive and insensitive behaviours. Rankings range from +2 (“very like”) to -2 (“very unlike”) the observed mother’s behaviour. The scored q-sorts are then correlated with the prototypical profile of a sensitive mother to achieve a sensitivity score from -1 (least sensitive parent) to +1 (most sensitive parent). In infancy, the MBQS has demonstrated validity through its association with other measures of maternal behaviour including the Ainsworth scales (see Pederson & Moran, 1995), and construct validity through its association with attachment security (Atkinson et al., 2000; Van IJzendoorn et al., 2004).
Previous exploration of the MBQS-Preschool found it to be associated with earlier assessments of maternal sensitivity assessed during infancy ($r = .33$ with 10-month sensitivity; $r = .45$ with 21-month sensitivity; Xue, 2015). One coder, blind to other measures and a trainer for the MBQS protocols, coded the MBQS-Preschool. Inter-rater reliability was calculated with a second well-trained coder 18 videos. Overall $ICC = .86$ between the two coders.

**Interesting But Scary Task (IbS):** Maternal sensitivity was coded during a 2-minute, age-appropriate, modified version of the Interesting But Scary (IbS) task (Forbes, Evans, Moran & Pederson, 2007). Traditionally, the task involves a brief exposure to a person or object that appears interesting but potentially frightening to the child. This exposure allows for the observation of how the parent acts as a secure base and safe haven for the child, and how the child solicits and experiences parental support. In the current study, the IbS involved interacting with an odd-looking but smiling, potentially frightening mask, hidden in a cupboard and equipped with a hidden microphone. Mothers were cued when it was time to open the cabinet, and were instructed to act as they typically would to support their child’s interaction with the talking mask. An experimenter in a different room engaged with the child through the speaker. The experimenter, with a friendly tone, asked the child what toys they played with during the session. After one minute of conversation, the experimenter invited the child to touch their face (i.e., the mask). The script used in the current study was adapted from ones used by Stevenson-Hinde and colleagues (Marshall & Stevenson-Hinde, 1998; Stevenson-Hinde & Marshall, 1999; Stevenson-Hinde & Shouldice, 1995).

**Preschool Attachment Classification System** (PACS; Cassidy et al., 1992): The well-established Strange Situation Paradigm (SSP; Ainsworth, Blehar, Waters & Wall, 1978) has been
modified to be developmentally appropriate for preschool aged children. Whereas the SSP involves eight short episodes, the PACS procedure takes a number of forms, but typically has only four, 5-minute episodes (specifically: a separation, reunion, separation, reunion) leaving the child alone during both separations to ensure that they experience a moderate amount of stress (as in Moss et al., 2004; NICHD, 2001). The PACS coding system expands upon the attachment behaviour patterns that are identified in infancy. The infant SSP classifications are Secure, Avoidant, Ambivalent, and Disorganized; these are retained with adaptation to account for developmental changes, and the PACS adds Controlling-general, Controlling-caregiving, Controlling-punitive, and Insecure-other classifications.

The PACS was scored by two trained and reliable coders. The first was an internationally recognized expert in preschool attachment and trainer for the PACS. The second had received formal training on coding the PACS: her coding was judged to be reliable through a training reliability check, in which 15 dyads were coded by both individuals. An additional 20% of PACS were coded by both individuals, with an overall 88% agreement on classification (κ=.83, \( p=.000 \)).

**Attachment Story Completion Task** (ASCT; Bretherton, Ridgeway & Cassidy, 1990): The ASCT is a doll-play paradigm during which children are presented with the appropriate doll figures (these can include a mother, father, babysitter, dog, cat, and two children—a boy and a girl) which the child uses to complete a story stem on a wooden board with different household rooms including two bedrooms, a kitchen, a living room, a grass yard with a large rock, and furniture. There are five story stems, the first of which is a teaching item and not scored. The other four scenarios are: a child hurts their knee, a child believes there is a monster in their room,
and separation and reunion scenarios with the parents (Solomon & George, 2016). For the separation stem, the child is told their parents are leaving for the weekend, and that they are staying with the babysitter. During the reunion, the parents have returned. For all story stems, children watched the examiner act out the story stem and were asked to show and tell what happens next. Examiners use standardized prompts to ask the child about the story they have enacted (Bretherton et al., 1990; Dubois-Comtois, Cyr, & Moss, 2011; Miljkovitch et al., 2004).

**Ottawa-Guelph Attachment Narrative Coding System (OGANCS; Yurkowski, Bureau, Bailey & McLean, 2012):** The ASCT is scored using 56 items, with 29 items representing organized attachment styles. Each individual item is scored based on how descriptive it is of the child’s story completion, with -3 indicating “not at all descriptive” and +3 indicating “very descriptive”. Items on the OGANCS address themes within the child’s narrative and their approach to providing a narrative. Factor analysis of the items designed to describe traditional secure and insecure attachment representations (see Appendix C) resulted in two scales: Effective Parental Help (e.g., “one or both parent(s) provide effective help and/or care to resolve attachment issue”) and Exaggerated Attachment Themes (e.g., “the attachment issue or amount of care needed is exaggerated”). The Effective Parental Help factor consisted of five items ($\alpha = .88$), and Exaggerated Attachment Themes consisted of three items ($\alpha = .66$). Given the stronger internal consistency demonstrated by the Effective Parental Help scale, and its stronger theoretical connection to attachment security, we expected it to be associated with maternal sensitivity to a stronger degree than the Exaggerated Attachment Themes scale. Therefore, Effective Parental Help was used to test our hypothesis, whereas Exaggerated Attachment Themes was considered exploratory. OGANCS items were scored by two coders.
who were trained on the measure. Twenty percent of the videos were coded by both individuals to establish reliability. Overall ICC (two-way mixed, absolute agreement) for the final scales were as follows: Effective Parental Help $ICC = .94$, Exaggerated Attachment Themes $ICC = .91$.

**Measures for post-hoc, exploratory analyses:** Preschoolers’ behavioural inhibition was assessed by Stevenson-Hinde and colleagues’ behavioural inhibition scales, with demonstrated reliability and validity (Marshall & Stevenson-Hinde, 1998; Stevenson-Hinde, Shouldice, & Chicot, 2011). Their behaviour was observed during the IbS task, when children were asked to talk to or touch the mask. Two scales rate a child’s nonverbal anxiety and low verbal responsiveness on a scale of 1 (relaxed/responsive) to 9 (high tension/no verbal response). These scales typically are combined to create a global behavioural inhibition scale, with a scale of 1 (no signs of inhibition) to 9 (extreme inhibition). In the full sample, inter-rater reliability was established using 25% of participants, with excellent reliability for the combined scale ($r=.90$, $p<.001$).

Expressive vocabulary was assessed by the Expressive Vocabulary Test-2 (EVT-2; Williams, 2007), a norm-referenced measure for children aged two to six years old. The EVT-2 asks a child to identify an object or picture with a single word. The EVT-2 has demonstrated strong construct validity with the Peabody Picture Vocabulary Test-Fourth Edition (.80 to .84; Williams, 2007). As noted by Oppenheim and colleagues (1997), children’s expression of their narrative during the story stems is likely influenced by their level of vocabulary.
Procedure

The study was approved by the Non-Medical Research Ethics Board (NMREB) at the University of Western Ontario and the University of Guelph Research Ethics Board (REB; see Appendix A and B). Dyads were invited for a lab visit that was video-recorded. As part of the larger study, a variety of tasks were administered in the same order for all participants, some of which were not relevant to the current study. First, the procedures and the informed consent process were reviewed with participants. Next, dyads were set up with physiological equipment to collect heart rate data, and baseline data were collected during a neutral video. While mothers completed questionnaires in a separate room, preschoolers completed tasks of executive functioning with a researcher. Dyads were then taken to a separate room to complete the SSP and IbS paradigm. Next, preschoolers completed the ASCT and an expressive vocabulary task with the researcher. At the end of the visit, examiners collected demographic information and debriefed with mothers. Dyads were reimbursed 30 dollars for their time and expenses.

Analytic Strategy

All statistical analyses were completed using IBM Statistical Package for the Social Sciences (SPSS) for Windows (Version 25). Interrater reliability was assessed through kappa correlations for the PACS, and intraclass correlations (ICC; two-way random, consistency agreement) for the ASCT scales and the MBQS-Preschool. Initial descriptive analyses (means, standard deviations) were presented for these three variables, followed by correlations with participant demographic information. Additionally, boxplots were examined for outliers. We explored the data to understand the nature of our missing data, and whether they violated assumptions of normality. In order to preserve missing data, multiple imputations were
conducted. Behavioural attachment classifications, representational attachment scales, and maternal sensitivity, along with demographic information (i.e., child gender, child age, mother’s age, mother’s education level, and family income) were included in the imputations. Imputed demographic information were not subsequently included in any analyses. Given that the maternal sensitivity and attachment representation data violated the assumption of normality, Spearman’s correlations were calculated on the imputed data after bootstrapping 1000 samples, to examine the association between each of behavioural and representational attachment security, and maternal sensitivity.

**Post-Hoc Exploratory Analyses:** After completing the planned data analyses, we explored additional relations between variables in order to better understand factors that may have contributed to the results specific to our dataset, and to generate hypotheses for future research. First, we examined associations between key variables and measures of behavioural inhibition and expressive language ability using Pearson product-moment correlations with bootstrapping (1000 samples). We then explored the possibility that a child’s behavioural inhibition or expressive language ability impacted the relation between sensitivity and attachment security by conducting separate partial correlations between maternal sensitivity and representational attachment scales while controlling for behavioural inhibition and expressive language. Unfortunately, behavioural inhibition data were not available for some participants ($n=52$) due to significant data loss as a result of a prior hardware malfunction; therefore, exploratory analyses were conducted with a smaller subsample ($n=48$).

Since research on the association between sensitivity and (in)security has pertained mostly to traditional insecure classifications (i.e., Avoidant and Ambivalent classifications), we
also explored the association between maternal sensitivity and attachment security after removing all non-traditional attachment classifications (i.e., controlling or disorganized) from the PACS. Finally, we examined the possibility of heterogeneity within attachment classifications on the PACS by observing whether subclassifications appeared to differ with respect to average scores on maternal sensitivity. We focused on the secure subgroups because fully 58.2% of the sample fell in this large group, and some heterogeneity was expected: the subclassifications within this group are thought to reflect meaningful differences in how the relationship is organized. Because of low sample sizes at the subclassification level, it was not appropriate to conduct a statistical analysis (Cumming & Calin-Jageman, 2016); however, differences were shown in a graph to support hypothesis generation. Within the broader secure categories, there are nuanced differences in how the parent and child interact with each other in both infancy and preschool. The B1 category is at one end of a spectrum, such that it involves harmonious secure attachment behaviours within a dyad but does not involve physical closeness like standard secure dyads. The standard secure dyad, B3, involves both harmony and physical closeness. B4’s are like B3, but with some ambivalence or controlling behaviour. Overall, these dyads are all judged as secure due to the physical closeness and harmony that they present. Our exploration assessed how each subgroup related to maternal sensitivity.

**Data Interpretation:** Shortcomings of traditional null-hypothesis significance testing (NHST) have been discussed for years. Cohen (1994), for example, is well-known for his stance against NHST and support of effect sizes. In terms of research guidelines, the American Psychological Association (APA) recommends only using NHST as a preliminary data analytic approach, but that appropriate communication of results requires the use of statistical concepts
including confidence intervals and effect sizes (APA, 2009). One reason for turning away from NHST is the lack of information that \( p \)-values and significance provide given their inconsistency across study replications (see Rosnow & Rosenthal, 2011 and Cumming, 2012 for a discussion). However, the information communicated through 95% confidence intervals is more widely understood by researchers, and allows for an estimate across replications. As discussed by Cumming and colleagues (Cumming et al., 2004; Cumming & Maillardet, 2006), there is a .83 probability that the mean of a replication sample will fall within the 95% confidence intervals. Due to this shift in methodology, and the important information that can be gathered from confidence intervals, analyses in the current study will include confidence intervals alongside point correlations in order to have an idea of the accuracy of a correlation. In the current study, 95% confidence intervals were interpreted in the following way: CIs ±.10 illustrate virtually no relation between variables, CIs between ±.10 and ±.29 illustrate a small relation between variables, CIs between ±.30 and ±.50 are considered moderate, and CIs that are <.50 or >.50 are considered strong (Cohen, 1992).
CHAPTER 3

Results

Sample Characteristics

Descriptive information for continuous variables is presented in Table 1. The potential range for maternal sensitivity scores was -1 to +1. The mean score for maternal sensitivity was -.09 (Min = -.83, Max=.84, SD=.59, skewness=.38). Before multiple imputation, data were available for a total of 93 participants. Data were missing for the following reasons: data storage malfunction (n = 4), participants declined IbS paradigm (n = 2), and incorrect protocol during IbS (n = 1).

Children’s attachment narratives from the ASCT were rated on two continuous scales from the OGANCS ranging from -3 to +3. For the Effective Parental Help scale, the mean was .06 (Min= -2.40, Max= 3.00, SD= 1.29, skewness=.25). For the Exaggerated Attachment Themes scale, the mean was -.50 (Min= -3.00, Max= 3.00, SD= 1.68, skewness=.29). Scores for the two representational scales were provided for a total of 94 participants. Regarding missing data, four videos of the ASCT were not available to be coded and one child was unable to complete the task.

Behavioural attachment classifications from the PACS were collapsed into two groups: secure and insecure classifications. Overall, 57 participants (58.2%) were judged to be secure and 41 (41.8%) were insecure. Two videos were unable to be coded, one due to technical difficulties and the second because both coders had previously viewed the video during a research presentation. Boxplots were examined for outliers using the interquartile range rule. No
outliers were identified for any variables or subscales at the 1.5 or 3.0 multiplier of the interquartile range.

Table 2 presents associations between demographic variables and the attachment and maternal sensitivity measures, with 95% confidence intervals. To err on the side of caution, correlations are in bold if they exceeded an absolute value of .20. The Effective Parental Help scale was somewhat associated with child gender and maternal age, with both girls and children of older mothers more likely to have story stems with helpful parents than boys or children of younger mothers. The Exaggerated Attachment Themes scale was somewhat associated with child gender and child age. Story stems conveyed by boys, or by older preschoolers, had more exaggerated themes in their story stems than girls, or by younger preschoolers, respectively.
Table 1: *Descriptive Statistics for the Continuous Variable Raw Data*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Min</th>
<th>Max</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Sensitivity</td>
<td>-.09</td>
<td>.59</td>
<td>-.83</td>
<td>.84</td>
<td>.38</td>
</tr>
<tr>
<td>Effective Help</td>
<td>.06</td>
<td>1.29</td>
<td>-2.40</td>
<td>3.00</td>
<td>.25</td>
</tr>
<tr>
<td>Exaggerated</td>
<td>-.50</td>
<td>1.68</td>
<td>-3.00</td>
<td>3.00</td>
<td>.29</td>
</tr>
</tbody>
</table>

Table 2: *Correlations between variables of interest and demographic information*

<table>
<thead>
<tr>
<th></th>
<th>Behavioural Attachment Classification</th>
<th>Effective Parental Help</th>
<th>Exaggerated Attachment Themes</th>
<th>Maternal Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Gender (n = 100) (Male = 1, Female = 2)</td>
<td>-.16 [.43, .11]</td>
<td>.23 [.04, .48]</td>
<td>-.30 [-.50, -.07]</td>
<td>-.02 [-.27, .25]</td>
</tr>
<tr>
<td>Child Age (n = 93)</td>
<td>-.10 [-.36, .17]</td>
<td>-.04 [-.28, .20]</td>
<td>.21 [-.03, .42]</td>
<td>.07 [-.33, .21]</td>
</tr>
<tr>
<td>Maternal Age (n = 85)</td>
<td>-.14 [-.38, .10]</td>
<td>.22 [.01, .42]</td>
<td>-.15 [.38, .08]</td>
<td>.12 [-.14, .37]</td>
</tr>
<tr>
<td>Maternal Education (n = 76)</td>
<td>-.09 [-.34, .16]</td>
<td>.02 [-.23, .27]</td>
<td>-.19 [.39, .01]</td>
<td>.08 [-.21, .36]</td>
</tr>
<tr>
<td>Family Income (n = 90)</td>
<td>.01 [-.25, .23]</td>
<td>.14 [-.15, .39]</td>
<td>.03 [-.23, .30]</td>
<td>.18 [-.07, .40]</td>
</tr>
</tbody>
</table>
Association between Maternal Sensitivity and Attachment Classifications

A missing data analysis revealed that 5.25% of all data points for the MBQS, ASCT, and PACS were missing. Table 3 depicts missing data from all variables. Little’s Missing Completely at Random (Little’s MCAR) test confirmed that missing data technically were missing completely at random, $X^2(22) = 31.73, p = .08$. Manly and Wells (2015) provide guidelines for multiple imputation and recommend best results for multiple imputation when less than 10% of data are missing. Therefore, we decided to use multiple imputation to preserve as much data as possible. Six imputations were conducted, following White and colleagues’ (2011) recommendation that the number of imputations should be at least the same as the percentage of missing data. Descriptive information for imputed continuous variables is included in Table 4. For categorical behavioural data, our pooled sample included a total of 100 participants (secure $n = 58$). A Shapiro-Wilk test of normality indicated that maternal sensitivity and both scales of attachment representation violated the assumption of normality, therefore we used Spearman’s correlation coefficient in subsequent analyses.
Table 3: **Summary of Missing Data**

<table>
<thead>
<tr>
<th></th>
<th>n Missing</th>
<th>Percent Missing</th>
<th>n Valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural Attachment Classification</td>
<td>2</td>
<td>2.0</td>
<td>98</td>
</tr>
<tr>
<td>Effective Parental Help</td>
<td>6</td>
<td>6.0</td>
<td>94</td>
</tr>
<tr>
<td>Exaggerated Attachment Themes</td>
<td>6</td>
<td>6.0</td>
<td>94</td>
</tr>
<tr>
<td>Maternal Sensitivity</td>
<td>7</td>
<td>7.0</td>
<td>93</td>
</tr>
</tbody>
</table>

Table 4: **Descriptive Statistics for the Continuous Variables after Multiple Imputation**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Sensitivity Pooled</td>
<td>-.09</td>
<td>.59</td>
</tr>
<tr>
<td>Effective Parental Help Pooled</td>
<td>.05</td>
<td>1.30</td>
</tr>
<tr>
<td>Exaggerated Attachment Themes Pooled</td>
<td>-.50</td>
<td>1.68</td>
</tr>
</tbody>
</table>
Correlation analyses were conducted to examine the association between maternal sensitivity and attachment security assessed using the behavioural and representational measures of attachment. Table 5 summarizes the correlations between attachment security and maternal sensitivity for both raw and imputed data. For both the raw and imputed data, behavioural attachment security was associated with maternal sensitivity, though confidence intervals were wide, ranging from virtually no relation to a moderate positive relation. The Effective Parental Help scale was not clearly related to maternal sensitivity, and CI’s around the association were also wide, ranging from a small negative relation to a small positive relation. Again, there was no clear relation between the Exaggerated Attachment Themes scale and maternal sensitivity, and CI’s around the association were wide and ranged anywhere from a small negative relation to a small positive relation. Neither Effective Parental Help nor Exaggerated Attachment Themes had a correlation of at least .17 with maternal sensitivity.
Table 5: Spearman’s Correlation Coefficient and 95% Confidence Intervals for Raw and Pooled Data

<table>
<thead>
<tr>
<th></th>
<th>PACS</th>
<th>Effective Parental Help</th>
<th>Exaggerated Attachment Themes</th>
<th>Maternal Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.00</td>
<td>.13</td>
<td>.09</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[-.07, .33]</td>
<td>[-.11, .29]</td>
<td>[-.02, .37]</td>
</tr>
<tr>
<td>2.</td>
<td>.06</td>
<td>1.00</td>
<td>-.13</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>[-.16, .29]</td>
<td></td>
<td>[-.33, .07]</td>
<td>[-.19, .20]</td>
</tr>
<tr>
<td>3.</td>
<td>.12</td>
<td>-.12</td>
<td>1.00</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>[-.07, .31]</td>
<td></td>
<td>[-.37, .13]</td>
<td>[-.16, .23]</td>
</tr>
<tr>
<td>4.</td>
<td>.18</td>
<td>.01</td>
<td>.04</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>[-.05, .39]</td>
<td></td>
<td>[-.19, .22]</td>
<td>[-.17, .24]</td>
</tr>
</tbody>
</table>

*Note: Correlations above the diagonal are for pooled data, and correlations below the diagonal are for raw data.*
Post Hoc Analyses

Control Variables: A few analyses were conducted post-hoc to further explore associations involving attachment and sensitivity. The zero-order correlations between the control variables, expressive language and behavioural inhibition, and the key variables, attachment security and maternal sensitivity, are presented in Table 6. Expressive vocabulary was associated with portrayals of more Effective Parental Help, such that children with greater expressive vocabulary abilities conveyed more effective parental help in their story stems.

Though CIs around the relation between expressive vocabulary and Effective Parental Help were wide, they indicated a small to strong positive relation. Expressive vocabulary and behavioural inhibition were both associated inversely with the Exaggerated Attachment Themes scale. Children with less expressive vocabulary abilities and behavioural inhibition conveyed more exaggerated themes in their story stems than children with more expressive vocabulary abilities or behavioural inhibition. The CIs around the association between expressive vocabulary and Exaggerated Attachment Themes were also wide, but consistently indicated a negative relation ranging from small to strong. However, the CIs around the association between behavioural inhibition and Exaggerated Attachment Themes ranged from virtually no relation to a moderate negative relation.
Table 6: Zero-Order Correlations Between Expressive Vocabulary and Behavioural Inhibition with Measures of Attachment Security and Maternal Sensitivity

<table>
<thead>
<tr>
<th></th>
<th>Behavioural Attachment Classification</th>
<th>Effective Parental Help</th>
<th>Exaggerated Attachment Themes</th>
<th>Maternal Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressive Vocab</td>
<td>.05</td>
<td>.38</td>
<td>-.32</td>
<td>-.08</td>
</tr>
<tr>
<td>Behavioural Inhibition</td>
<td>[-.23, .31]</td>
<td>[.14, .58]</td>
<td>[-.53, -.10]</td>
<td>[-.34, .18]</td>
</tr>
<tr>
<td>Behavioural Vocab</td>
<td>.02</td>
<td>-.18</td>
<td>-.23</td>
<td>-.01</td>
</tr>
<tr>
<td>Inhibition</td>
<td>[-.27, .30]</td>
<td>[-.44, .08]</td>
<td>[-.49, .04]</td>
<td>[-.30, .25]</td>
</tr>
</tbody>
</table>
Partial correlations with bootstrapping were calculated to assess the association between maternal sensitivity and the two representational attachment scales, while controlling for expressive language and behavioural inhibition (see Table 7). The association between most measures increased somewhat when controlling for the two variables; however, confidence intervals also increased as a result of adding covariates and using raw data in these analyses due to the extent of missing data. Confidence intervals around the association between behavioural attachment classifications and maternal sensitivity ranged from almost no relation to a strong relation. The confidence intervals around the relation between Effective Parental Help and maternal sensitivity ranged from a small negative relation to a moderate positive relation. Finally, the confidence intervals around the relation between the Exaggerated Attachment Themes scale and maternal sensitivity ranged from a moderate negative relation to a small positive relation.
Table 7: Partial Correlations and 95% Confidence Intervals for Continuous Variables, controlling for Behavioural Inhibition and Expressive Language

<table>
<thead>
<tr>
<th></th>
<th>PACS</th>
<th>Effective Parental Help</th>
<th>Exaggerated Attachment Themes</th>
<th>Maternal Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.00</td>
<td>.14 [ -0.19, 0.43]</td>
<td>.24 [-0.07, 0.52]</td>
<td>.25 [-0.06, 0.51]</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td>.09 [-0.43, 0.30]</td>
<td>.11 [-0.18, 0.41]</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td>.06 [1.00]</td>
<td>.38 [-0.38, 0.24]</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>
**Traditional Organized Attachment Classifications:** A follow-up analysis was conducted involving only dyads with traditional attachment classifications (Avoidant, Secure, and Ambivalent). For this analysis, those with disorganized, controlling, and other non-traditional attachment classifications were excluded. Correlations with bootstrapping were calculated on cases with organized attachment and maternal sensitivity scores \((n=68)\) to assess whether there would be an association between maternal sensitivity and secure attachment. Here, \(r = .24, \text{CI } [.04, .45]\), indicating that the association could range from no relation to a moderate positive relation.

**Secure Subclassifications:** The mean maternal sensitivity for the individual secure behaviour patterns (see Table 8) was graphed in order to explore the heterogeneity of secure attachment classifications. Given the small sample size of each subclassifications, follow-up analyses were not conducted. The relations are illustrated in Figure 2. Based on these small samples, it appears that preschoolers classified in the B4-secure controlling group experienced somewhat more maternal sensitivity than those in the other subclassifications. In contrast, preschoolers in the B4-secure ambivalent group experienced somewhat less maternal sensitivity than those in the other subclassifications.
Table 8: *Descriptions of Secure Classification Subtypes*

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Demonstrate harmonious behaviour with caregivers, but less physical closeness</td>
</tr>
<tr>
<td>B3</td>
<td>Demonstrate both harmonious behaviour and age-appropriate physical closeness with caregivers</td>
</tr>
<tr>
<td>B4 ambivalent</td>
<td>Demonstrate both harmonious behaviour and age-appropriate physical closeness with caregivers, along with a modest amount of behaviour typically seen in ambivalent children (e.g., relatively greater display of negative emotion)</td>
</tr>
<tr>
<td>B4 controlling</td>
<td>Demonstrate both harmonious behaviour and age-appropriate physical closeness with caregivers, along with a modest amount of behaviour typically seen in controlling children (e.g., role reversal)</td>
</tr>
</tbody>
</table>

Figure 2: Means of maternal sensitivity for the PACS secure attachment subclassifications.
CHAPTER 4

Discussion

This paper sought to build on attachment theory at the preschool age by examining the association between attachment security, assessed via behaviour and representations, and maternal sensitivity. Regarding our hypothesis, the strength of the association between behavioural attachment security and maternal sensitivity fell within a range consistent with previous research on this association in infancy. On the contrary, our hypothesis of an association between representational attachment security and maternal sensitivity was not supported. In the following discussion we consider a broad range of factors that may have influenced these findings, the confidence intervals around these findings, and make recommendations for future research.

Behavioural Measures of Attachment and Sensitivity

The association between behavioural attachment security and maternal sensitivity fell where we hypothesized based on the same relation in infancy. We estimated based on the relation in infancy because, as highlighted previously, to our knowledge only one examination of the association between attachment security and maternal sensitivity has been published at the preschool age. Although our association between attachment security and maternal sensitivity was as we predicted, and values in the middle of CI’s are more likely to represent the population values, it is important to address the full CI’s around the association. In the current study, the wide confidence interval ranged from no relation to a moderate positive relation. Future research with an increased sample size, or meta-analyses, could narrow these confidence intervals and allow us to better estimate the association between behavioural attachment security and maternal
sensitivity in preschool. That being said, our results are consistent with those reported by Bureau and colleagues (2017), who used a laughing task to assess concurrent maternal sensitivity and found it to be related to preschool security assessed by the PACS. The correlation between the child-mother dyad’s attachment security and maternal sensitivity was $r = .25$, and child-father dyad’s attachment security and paternal sensitivity was $r = .35$. The associations provided by these two studies between attachment security and maternal sensitivity extend one of the central tenets and assumptions of attachment theory into the preschool age: that the two constructs are associated. Similar to the current study, Bureau and his research team used a dichotomous classification of attachment security in order to maintain sufficient power.

This theory-consistent finding notwithstanding, there are disadvantages to dichotomizing attachment security as was done in the current study. Fraley and colleagues (2015) explored whether adult attachment security was best understood categorically or through dimensions and found that dimensions better conceptualize attachment security. As addressed in their review, dichotomizing or categorizing continuous variables results in a loss of information about how individuals within a specific category might differ, and therefore limits how well we can understand other factors related to attachment security. In our case, dichotomizing behavioural sensitivity limited how well we could understand its relation with maternal sensitivity. Further, two children being classified as secure does not necessarily mean that they were secure to the same degree, or in the same way, as one another, or that they experienced the same level of maternal sensitivity. Using continuous variables, at least some of this variability could be retained.
To begin to address this limitation of dichotomous variables, we conducted additional analyses to explore the nuances of the association between attachment security and maternal sensitivity. First, we removed all preschoolers who were classified with non-traditional attachment patterns (e.g., controlling classifications) from analyses, and re-examined the association between attachment security and maternal sensitivity. Here, the relation between variables was somewhat stronger than when non-traditional classifications were included. Thus, when considering traditional attachment classifications (i.e., secure, ambivalent, and avoidant), behavioural attachment security has a stronger association with maternal sensitivity than it does when the insecure group also includes the disorganized and controlling classifications. Future research should aim to explore the non-traditional disorganized and controlling preschoolers more explicitly, and explore what other factors might be related to them. Next, we briefly examined the heterogeneity within secure classifications by visually comparing the mean maternal sensitivity for each subclassification of secure attachment (see Table 8 for descriptions of these subclassifications). In particular, the B4-controlling group was generally observed to experience somewhat more maternal sensitivity than other secure groups, and the B4 ambivalent group with less. These differences support the need for preschool attachment research with larger sample sizes, or combined samples, to support research at the level of subclassification, in order to better understand the heterogeneity within the secure behavioural attachment pattern. Another approach would be to develop continuous attachment measures that explain differences among classifications and subclassifications.

Considering that children in secure attachment relationships may experience varying levels of parental sensitivity, future research should explore whether preschoolers with certain
secure subclassifications are more sensitive to maternal sensitivity, following a differential susceptibility model (see Belsky, Bakermans-Kranengburg & van IJzendoorn, 2007).

Additionally, the role of moderating factors, such as a preschooler’s anxiety or temperament, should be explored to understand the discrepancies between attachment security and maternal sensitivity. For example, might a child with a sensitive caregiver who also experiences anxiety display a controlling, rather than secure, relationship with their caregiver due to their intolerance of uncertainty? This is a call for attachment researchers to consult and collaborate in order to collect data sets large enough to accommodate these more specific research questions.

**Representational Measures of Attachment and Sensitivity**

In the current sample, the association between children’s portrayal of Effective Parental Help in their narratives and maternal sensitivity was lower than we expected. The confidence intervals for the association were wide and ranged from a small negative to a moderate positive relation. Therefore, it is not possible to specify the strength or direction of the true relation between these two variables. The association between the Exaggerated Attachment Themes scale and maternal sensitivity was also lower than expected, with confidence intervals that ranged from a small negative to a small positive relation. Again, it is not possible to understand these confidence intervals.

As previously discussed, there are no known explorations of the association between representational attachment and maternal sensitivity in a typically developing sample of preschoolers. Our results do align, however, with Piermattei and colleagues (2017), who did not find a relation between representational attachment and maternal sensitivity assessed through the Emotional Availability Scales (EAS; Biringen, 2008). However, this single corroboration doesn’t
provide certainty, given the wide confidence intervals in the current study, and small positive association, which could also be interpreted as a meaningful (if modest) relation between the two measures.

There are many reasons why representational attachment security might not have a clear association with maternal sensitivity in the current study. First, the doll-play measure involved both a mother and father doll, whereas the MBQS-Preschool only assessed maternal sensitivity. Therefore, it is possible that the doll-play measure is assessing the attachment relationship with both parents, and thus would not align fully with maternal sensitivity. Our representational attachment scales did not include differentiation of which parent provided Effective Parental Help or was potentially involved in Exaggerated Attachment Themes, and we did not include a measure of paternal sensitivity, making it difficult to tease this relation apart. Therefore, it is important that future research assesses the behaviour of both parent figures within the story-stem narratives, and to include a measure of paternal sensitivity as well. Controlling for the preschooler’s parents’ relationship might also be important when considering doll-play story stems, as children who have witnessed more aggression or discord between their parents might complete story-stems differently. Additionally, the representational assessment used in this study does not involve the preschooler interacting with their parent, like both the PACS and MBQS-Preschool do. Campbell and Fiske (1959) discuss this limitation to using mixed assessment methods in research, and how they can attenuate associations between variables.

We explored the associations between our variables of interest and demographic variables, using a relatively low threshold to be conservative when examining them. Of the associations, child gender was associated with the two attachment representation scales: girls
were more likely than boys to convey parental help in their story stems, and boys were more likely than girls to convey Exaggerated Attachment Themes. It is possible that different patterns of play evidenced by boys and girls influence how they manage the story-stem tasks. For example, boys often engage in more active play, while girls often play in greater proximity to adults (Fabes, Martin, & Hanish, 2003). Both of these gender differences could affect how children approach story-stem tasks: the active play might be represented through boys exhibiting more Exaggerated Attachment Themes, and girls’ greater comfort playing around adults may make it easier for them to convey Effective Parental Help to a stranger in a novel situation.

Finally, maternal age was somewhat associated with the Effective Parental Help scale, and child age was somewhat related to the Exaggerated Attachment Themes scale. In our analyses, we did not explicitly explore these relations further due to our small sample size. However, future explorations should more intentionally look at how factors related to these variables, such as the socialization of children’s emotion or play, and maternal experiences, might impact a child’s story stems. These possibilities reiterate the need to examine how child and parent factors may influence the relations between attachment security and maternal sensitivity.

Through our exploratory analyses, we tried to understand whether behaviour inhibition and expressive vocabulary played a role in the relation between attachment security and maternal sensitivity. Here, it appeared that the association between each of Effective Parental Help Exaggerated Attachment Themes with maternal sensitivity was strengthened to some extent. However, use of covariates broadened the confidence intervals for the associations as well. The increase in confidence intervals may be because these analyses were not conducted with imputed
data, as there was too much missing data to use the method. This meant that analyses were done with a much smaller sample size. Overall, it appears that representational attachment methods are sensitive to behavioural inhibition and expressive vocabulary. Zero-order correlations between expressive vocabulary and the representational attachment scales indicated a positive association with the Effective Parental Help scale and an inverse one with the Exaggerated Attachment Themes scale. This might be because children who have a greater expressive vocabulary have the capacity to demonstrate themes related to parental help better than those with less of a vocabulary. Further, expressive vocabulary ability is related to receptive vocabulary. Therefore, preschoolers with greater expressive language abilities might also understand the task better than preschoolers with less of a vocabulary. On the other hand, preschoolers with lower expressive vocabulary abilities were more likely to portray exaggerated themes than those with greater expressive vocabulary abilities. Children with a less developed vocabulary might return to themes that they had expressed previously during the task because they are easier to communicate than a new story-stem. On the contrary, it may be easier for children with greater expressive vocabulary abilities to express new ideas through their narratives. Therefore, it is likely that the story-stem a child is able to produce or communicate is impacted by their language abilities: this impact must be examined more thoroughly.

In the case of behavioural inhibition, it was negatively associated with both scales of representational attachment security. This may have impacted their performance on the story-stem protocol, as children were asked to tell stories to strangers, in a new setting, while their mothers were in another room. Evidently, understanding how behavioural inhibition impacts a child’s story stems is important for future research as well.
Limitations and Future Directions

It is important that future research both replicate and expand on the current findings. Many aspects of the current study can be built upon in order to make results more generalizable, and better understood. One primary limitation that has already been discussed is the use of dichotomous categorizations of behavioural attachment, rather than continuous ones. Given the heterogeneity within attachment categorizations, it will be useful for future research to include the individual sub-groupings of classifications, or use continuous scales. Other limitations and areas for future exploration include providing additional evidence for the construct validity of the measures, and including fathers, non-heteronormative families, and high-risk groups in future samples.

Construct Validity: As is true in any psychological research, one common concern is ensuring that measures are assessing the latent variables they intend to assess. In the current study, we endeavoured to ensure this with all three key measures. Behavioural attachment security was assessed using what is considered the gold-standard assessment measure for preschool attachment relationships: the PACS. In order to assess representational attachment security, we used scales derived from a factor analysis of items hypothesized to depict traditional secure and insecure attachment representations. As an assessment of maternal sensitivity, we used a modified version of the gold-standard measure of maternal sensitivity in infancy. However, given the relative paucity of research comparing these constructs at the preschool age, these measures could be correlated with other correlates of attachment security or maternal sensitivity in order to further establish their construct validity. For example, patterns of physiological data such as heart rate variability have been associated with maternal sensitivity.
(Moore et al., 2009), and could be used to provide additional support for the MBQS-Preschool as an assessment of maternal sensitivity. Additionally, other measures of sensitivity at this age group, such as the Maternal Behaviour for Preschoolers Q-Set (MBPQS; Posada, Kaloustian, Richmond & Moreno, 2007), could be used as correlates, though they are typically more time-consuming than the MBQS-Preschool.

That being said, the current findings do support the use of the MBQS-Preschool, which is a relatively novel revision of the MBQS-Mini (Tarabulsy et al., 2005), used frequently in infancy. Because the MBQS-Preschool and the PACS were modestly associated in this sample, particularly when testing a more explicit hypothesis involving traditional attachment classifications, or when covariates were used, this association provides some degree of support for the validity of the MBQS-Preschool. Of course, replication of these findings, along with establishing other constructs of validity, will be important in the future.

**Expanding Beyond the Mother-Child Dyad:** The current study involved only children and their mothers. As identified by other attachment and parenting researchers (for example, Bureau et al., 2017), societal changes have resulted in an increasing role for fathers in the care of children. Understanding how paternal sensitivity is related to attachment security, and how it might differ from patterns involving maternal sensitivity, is therefore an important area of future exploration. Further still, there is an inherent limitation to any research that only assesses attachment security or sensitivity in the context of heteronormative family structures. The doll-play story stems used in the current study involved one mother and one father, and therefore did not allow for more diverse family make-ups. To our knowledge, there is no available research on
same-sex parenting and its association with attachment security and maternal sensitivity in preschool.

**High-Risk Populations:** Another interesting future exploration would be to use a high-risk sample to explore the association between attachment security and maternal sensitivity. In previous research using doll-play representational measures of attachment, children of mothers with current diagnoses of depression were more likely to exhibit aggression in their story completions, but less likely to verbally express anger (Trapolini, Ungerer & McMahon, 2007). This report is consistent with attachment theory, as mothers not experiencing a depressive episode may be better able to support their children discussing emotions, rather than express them physically. Research by Poehlmann (2005) found a number of theoretically consistent associations between maternal incarceration and attachment insecurity with current caregivers and biological mothers, assessed representationally. Potentials markers of resiliency, where children were more likely to experience secure attachment patterns, include living with the same caregiver since their mother was incarcerated, being older at the time of separation, and initially responding to the separation from their mother with sadness (Poehlmann, 2005). Exploring the relationship between attachment security and maternal sensitivity in high-risk populations would further build on these theoretically consistent findings, and be important in order to support families who are at high-risk clinically.

In conclusion, the current study aimed to address the paucity of research regarding attachment security in the preschool age. Results are promising in that an association between behavioural attachment security and maternal sensitivity was found; however, the CI’s around this association are broad and thus warrant further exploration. Further, the association between
attachment security and maternal sensitivity was not evident using a representational measure of attachment. Intriguing findings from exploratory analyses suggest a number of promising avenues for future research, and highlight the need to use continuous variables and expand the scope of assessment beyond the mother-child relationship. The importance of attachment relationships for later development, and increased language abilities and independence in preschoolers, make attachment at this age important to explore and understand.
REFERENCES


Main, M., & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented attachment pattern.


depressive disorder: a randomized preventive trial. *Journal of Consulting and Clinical Psychology*, 74(6), 1006.


APPENDICES

Appendix A: REB Approval

UNIVERSITY OF GUELPH
RESEARCH ETHICS BOARDS
Certification of Ethical Acceptability of Research
Involving Human Participants

<table>
<thead>
<tr>
<th>APPROVAL PERIOD:</th>
<th>October 19, 2018</th>
</tr>
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<tbody>
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<td>October 18, 2019</td>
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<tr>
<td>REB:</td>
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<tr>
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<tr>
<td>TYPE OF REVIEW:</td>
<td>Delegated</td>
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<tr>
<td>PRINCIPAL INVESTIGATOR:</td>
<td>Thomasin, Kristel (<a href="mailto:kristel.thomasin@uoguelph.ca">kristel.thomasin@uoguelph.ca</a>)</td>
</tr>
<tr>
<td>DEPARTMENT:</td>
<td>Psychology</td>
</tr>
<tr>
<td>SPONSOR(S):</td>
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</tr>
<tr>
<td>TITLE OF PROJECT:</td>
<td>Measuring attachment in the preschool years</td>
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</table>

The members of the University of Guelph Research Ethics Board have examined the protocol which describes the participation of the human participants in the above-named research project and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement, 2nd Edition.

The REB requires that researchers:
- Adhere to the protocol as last reviewed and approved by the REB.
- Receive approval from the REB for any modifications before they can be implemented.
- Report any change in the source of funding.
- Report unexpected events or incidental findings to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants, and the continuation of the protocol.
- Are responsible for ascertaining and complying with all applicable legal and regulatory requirements with respect to consent and the protection of privacy of participants in the jurisdiction of the research project.

The Principal Investigator must:
- Ensure that the ethical guidelines and approvals of facilities or institutions involved in the research are obtained and filed with the REB prior to the initiation of any research protocols.
- Submit an Annual Renewal to the REB upon completion of the project. If the research is a multi-year project, a status report must be submitted annually prior to the expiry date. Failure to submit an annual status report will lead to your study being suspended and potentially terminated.

The approval for this protocol terminates on the EXPIRY DATE, or the term of your appointment or employment at the University of Guelph whichever comes first.

Signature: [Signature]
Date: October 19, 2018

Stephen P. Lewis
Chair, Research Ethics Board-General
Office of Research Ethics
The University of Western Ontario
Room 4180 Support Services Building, London, ON, Canada N6A 5C1
Telephone: (519) 661-3036 Fax: (519) 850-2466 Email: ethics@uwo.ca
Website: www.uwo.ca/research/ethics

Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. G.A. Moran
Review Number: 10390S
Review Date: November 14, 2008
Revision Number: 12
Review Level: Expedited
Protocol Title: Exploring the Nature and Origins of Parent Child Relationships
Department and Institution: Psychology, University of Western Ontario
Sponsor:
Ethics Approval Date: November 14, 2008
Expiry Date: April 30, 2010
Documents Reviewed and Approved: Revised study methods and study instruments.

Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the applicable laws and regulations of Ontario has granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the NMREB’s periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the study or consent form may be initiated without prior written approval from the NMREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g., change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the NMREB:

a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) all adverse and unexpected experiences or events that are both serious and unexpected;
c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the NMREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the NMREB.

Chair of NMREB: Dr. Jerry Paquette

Ethics Officer to Contact for Further Information:
Grace Kelly (grace.kelly@uwo.ca)
Janice Sutherland (sutherl@uwo.ca)
Elizabeth Warnbolt (ewarnbol@uwo.ca)
Denise Grafton (dgrafton@uwo.ca)

This is an official document. Please retain the original in your files.
Appendix B: Informed Consent

Exploring Parent-Child Relationships, Emotion Regulation, Children’s Thinking and Heart and Respiration Responses at the Preschool Age

Western

Dear Parent,

We are conducting a study with 3 1/2 year olds and their parents to learn more about preschoolers’ development in the areas of relationships, emotions and thinking. We want to understand how children’s relationships with their parents develop at this age, how they talk about emotions and how they learn to think about different things. We will be asking you and your child to do a variety of activities both together and apart. The visit will last approximately an hour and a half and will be videotaped. If you do not wish to be videotaped you should not participate in the study. You are always free to choose not to participate in an activity or answer a question.

In this visit, we will have both you and your child wear some special equipment. You will have a small sensor clipped to your waist and your child will wear a light-weight vest with the sensor inside. These will monitor and record your heart rate and your breathing as you go through the activities. All of the equipment is safe to wear and the electrodes feel a lot like putting on and then removing a sticker. A new area of research has been looking at how mothers and their children regulate at a physiological level, that is, how their heart rates are often in “sync”, so we are interested to see how this relates to other areas of preschoolers’ development.

- After you are both set up with the special equipment, we will ask your child to do two quick activities that tell us about his/her thinking. In the first activity, your child will be instructed to provide one of two words depending on the picture card presented. In the second task, your child will be asked to find the correct targets on a page of different pictures. We are interested to see if preschoolers can remember and correctly employ the rules of the game and if they can successfully focus their attention to find the correct targets. While your child is doing those activities, we will give you a package of questionnaires to begin filling out. These will help us to further understand your child’s development.

- Then, because we are interested in how your child plays in new surroundings both when you are present and when you are not, we will then ask you to leave your child for two brief periods (approximately 4 minutes each) during this part of the visit. If your child becomes upset, we will send you back in immediately.

- Following that, when you and your child are in the room together, we will observe how your child reacts to an interesting, but unusual mask of an old woman. The old woman will speak to your child and your child may find this a bit scary. If you feel that your child has become too upset, we will stop the task. We would like to observe what your child does in response to the unusual mask as a way of better understanding preschoolers’ emotion regulation skills.

- You and your child will then separate again, and your child will be asked to make up some stories involving dolls. Your child will not be alone: someone from our research team will be with him/her during this time. In the meantime, you will be completing some questionnaires and brief activities in an adjacent room. The questionnaires and activities that you complete will parallel the things that your child does, and will help us to understand where children learn different skills and abilities.

- Next, you and your child will get together for a snack and you will be asked to talk about some past experiences involving various emotions. This will help us to understand preschoolers’ behavior in relationships with parents and will provide more information about their emotion regulation skills.
Finally, we will ask you some questions about demographic information while your child is asked to tell us the names of some pictures and objects. If, at this point, you haven’t had a chance to complete all of the questionnaires in the package that you received at the start of the visit, we will provide you with a self-addressed, stamped envelope and ask you to complete them at home and mail them back to us.

All information collected from you for the study will be kept confidential. All written and videotaped records and questionnaires will be assigned numbers to maintain confidentiality. Any identifying information such as names and place of birth will be changed to maintain confidentiality. Only those directly involved in the study will see the transcripts and videotapes unless you agree that fragments can be used for professional training. The family names will only be available to direct members of the research group. Absolute confidentiality cannot be guaranteed as we may have to disclose certain information as required by law according to provisions under the Child and Family Services Act. This includes any suspicion that a child under the age of 16 years is or has been abused or if you are in imminent danger of hurting yourself or another person. If the results of the study are published, your name will not be used and no information that discloses your identity will be released or published.

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time. Even if specific questionnaires request that you answer every question you do not have to do so. There are no known risks associated with any of the procedures. As mentioned above, the electrodes, feel a lot like putting on and then removing a sticker. If you feel that this is too upsetting for your child, we will discontinue this part of the visit. This study will not result in any direct benefit to you or your child, but will help us to further understand the development of preschoolers. In appreciation for your assistance with the study you will receive $30.00 and a DVD with selected excerpts from your visit.

Throughout the study we will ask you if you have any questions about any of the procedures. We would also appreciate any ideas or advice about your experience as a participant. We hope that participating in this study will be an interesting time for you and your child. If at any time you have questions or concerns, please do not hesitate to let the researcher know or you can contact the principal investigators or research coordinator listed below:

<table>
<thead>
<tr>
<th>Dr. Greg Moran</th>
<th>Dr. Heidi Bailey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Psychology</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>University of Western Ontario</td>
<td>University of Guelph</td>
</tr>
<tr>
<td>(519) 661-2111 extension 83109</td>
<td>(519) 824-4120 extension 5699</td>
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<table>
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<tr>
<th>Dr. Jean-Francois Bureau</th>
<th>Dr. David Pederson</th>
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<td>Department of Psychology</td>
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<td>University of Ottawa</td>
<td>University of Western Ontario</td>
</tr>
<tr>
<td>(613) 662-5800 extension 4484</td>
<td>(519) 661-2111 extension 84672</td>
</tr>
</tbody>
</table>

Sandi Bento
Research Coordinator
Child Development Centre
(519) 661-2111 extension 84660

If you have questions about the conduct of this study or your rights as a research subject you may contact:

The Director
Office of Research Ethics
The University of Western Ontario
519-661-3036
Or email at: ethics@uwyo.ca
I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Parent’s Name (Please Print)

Parent’s Signature                                      Date

Name of Person Obtaining Informed Consent

Signature of Person Obtaining Informed Consent                                      Date

☐ Please check this box if you would like to receive a summary of study findings after the study has been completed.
Appendix C: Description of Exploratory Factor Analysis of OGANCS Data  

(abridged)

The Ottawa-Guelph Attachment Narrative Coding System (OGANCS) includes 29 items that describe elements of traditionally conceptualized avoidant, secure, and ambivalent attachment representations. Table 1 contains a list of these items, together with the attachment representation each item is thought to index and supportive citations. It also lists interrater reliability on each item (two-way random, single measures intra-class correlations), calculated based on 20 percent of the sample. Items with interrater reliability equal to or greater than .7 were included in subsequent analyses: in total, 12 of the 29 items met this criterion.

<table>
<thead>
<tr>
<th>Item</th>
<th>Interrater reliability (ICC)</th>
<th>Attachment category originally targeted</th>
<th>Source (either taken directly or inspired by their criteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>.812</td>
<td>A</td>
<td>Bretherton et al. (1990) : Page 290</td>
</tr>
<tr>
<td>5</td>
<td>.500</td>
<td>A</td>
<td>Oppenheim, Nir et al.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Value</td>
<td>Source</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>One or both parent(s) provide spontaneous prompt help to resolve the attachment issue that was not solicited by the child.</td>
<td>.919</td>
<td>Bretherton et al. (1990): Page 290</td>
</tr>
<tr>
<td>7</td>
<td>Parent(s) intends to help child, but different events occur that interrupt or delay the help provided.</td>
<td>.594</td>
<td>Solomon et al. (1995): Page 454-455</td>
</tr>
<tr>
<td>8</td>
<td>One or both parent(s) provide effective help and/or care to resolve attachment issue.</td>
<td>.859</td>
<td>Bretherton et al. (1990): Page 288</td>
</tr>
<tr>
<td>9</td>
<td>Parent(s) responds but does not address the specific source of distress.</td>
<td>.637</td>
<td>Dubois-Comtois et al. (2008): Page 421</td>
</tr>
<tr>
<td>10</td>
<td>Parental help is incomplete or only partially effective: Parent(s) starts providing help but for some reason, the care is not completed.</td>
<td>.387</td>
<td>Bretherton et al. (1990): Page 293</td>
</tr>
<tr>
<td>11</td>
<td>Parent(s) questions attachment issue OR denies the issue without offering another explanation.</td>
<td>.669</td>
<td>Bretherton et al. (1990): Page 293</td>
</tr>
<tr>
<td>12</td>
<td>Parent(s) provide an answer or explanation for attachment issue that increases, rather than decreases, anxiety.</td>
<td>.769</td>
<td>Dubois-Comtois et al. (2011): Page 343</td>
</tr>
<tr>
<td>13</td>
<td>There is evidence of recovery and return to exploration following activation of the attachment system: Child is able to interact with others after resolving distress.</td>
<td>.417</td>
<td>Dubois-Comtois et al. (2011): Page 343</td>
</tr>
<tr>
<td>14</td>
<td>Family members show affection towards each other at one or more moments throughout the participant’s completion of stories.</td>
<td>.713</td>
<td>Bretherton et al. (1990): Page 288</td>
</tr>
<tr>
<td>15</td>
<td>Helping behaviour is enacted between two characters beyond</td>
<td>.234</td>
<td>Robinson &amp; Mantz-Simmons (2003):</td>
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<td></td>
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<tr>
<td>16</td>
<td>Situation(s) take place in which two or more family members are participating in an activity together and there is a sense of inclusion or belonging.</td>
<td>.170</td>
<td>B</td>
</tr>
<tr>
<td>17</td>
<td>There are interpersonal conflicts or signs of discord between characters.</td>
<td>.879</td>
<td>C</td>
</tr>
<tr>
<td>19</td>
<td>Child uses a coping strategy that functions to deactivate the distress rather than fixing the issue.</td>
<td>.070</td>
<td>A</td>
</tr>
<tr>
<td>20</td>
<td>Parent(s) uses appropriate discipline when needed.</td>
<td>-.055</td>
<td>B</td>
</tr>
<tr>
<td>21</td>
<td>Parent(s) are involved in the resolution of attachment issues (whether or not it is effective).</td>
<td>.876</td>
<td>B</td>
</tr>
<tr>
<td>22</td>
<td>Participant demonstrates an understanding of feelings/emotions/desires that motivate relational behaviours.</td>
<td>.455</td>
<td>B</td>
</tr>
<tr>
<td>23</td>
<td>When the child needs help or is in distress, parent(s) address child’s emotion/distress in a supportive way.</td>
<td>.620</td>
<td>B</td>
</tr>
<tr>
<td>24</td>
<td>One of the family members shows empathy towards another family member.</td>
<td>.440</td>
<td>B</td>
</tr>
<tr>
<td>25</td>
<td>The attachment theme is re-enacted more than once in the same story such that resolutions lack a sense of permanence.</td>
<td>.950</td>
<td>C</td>
</tr>
<tr>
<td>26</td>
<td>The attachment issue or amount of care needed is exaggerated.</td>
<td>.865</td>
<td>C</td>
</tr>
<tr>
<td>27</td>
<td>The attachment theme is repeated in another story.</td>
<td>.851</td>
<td>C</td>
</tr>
<tr>
<td>28</td>
<td>Participant raises additional</td>
<td>.731</td>
<td>C</td>
</tr>
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</table>
An exploratory factor analysis was used to develop scales that describe the traditional secure and insecure attachment representations. A principle axis factor analysis with promax rotation and scree plot examination yielded a two-factor model accounting for 42 percent of the variance (30 and 12% before rotation, respectively; sums of squared loadings following rotation were 3.5 and 1.5). Following rotation, five items loaded strongly (> .5 or < -.5) on the first factor, and three loaded strongly on the second factor. In second iteration of the factor analysis, items were removed if the primary factor loading was less than an absolute value of .5, and/or its cross-loading on another factor was greater than an absolute value of .3. The resultant two-factor solution accounted for 56% of the variance, with the identical set of items loading on the two factors after rotation. As seen in Table 2, items loading on Factor 1 described children’s portrayal of parents as involved and effective in helping them resolve attachment-related problems. This factor was labeled “Effective Parental Help.” One item was reverse-scored. Items loading on the second factor described children’s exaggeration of attachment problems, or inclusion of additional issues to be resolved, over and above those introduced in the story system. The factor was labeled “Exaggerated Attachment Themes.” Rather than using factor scores (which are sample-specific) for analyses, we created two scale scores by averaging items that loaded on each factor. Internal consistency for these scales, together with descriptive statistics, intercorrelations are presented in Table 3.

**Table 2. Factor loadings from the pattern matrix**
Factor Loadings

<table>
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<tr>
<th>Factor 1: Effective Parental Help</th>
<th>Item Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>.88 Item 1</td>
<td>The child’s attachment-related need or vulnerability is acknowledged by parent.</td>
</tr>
<tr>
<td>.83 Item 6</td>
<td>One or both parent(s) provide spontaneous help to resolve the attachment issue that was not solicited by the child.</td>
</tr>
<tr>
<td>.86 Item 8</td>
<td>One or both parent(s) provide effective help and/or care to resolve attachment issue.</td>
</tr>
<tr>
<td>-.52 Item 12 (reverse-scored)</td>
<td>Parent(s) provide an answer or explanation for attachment issue that increases, rather than decreases, anxiety.</td>
</tr>
<tr>
<td>.85 Item 21</td>
<td>Parent(s) are involved in the resolution of attachment issues (whether or not it is effective)</td>
</tr>
</tbody>
</table>

Factor 2: Exaggerated Attachment Themes

<table>
<thead>
<tr>
<th>Item 25</th>
<th>The attachment theme is re-enacted more than once in the same story such that resolutions lack a sense of permanence.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 26</td>
<td>The attachment issue or amount of care needed is exaggerated.</td>
</tr>
<tr>
<td>Item 28</td>
<td>Participant raises additional attachment issue(s) that require help/comfort from parent(s).</td>
</tr>
</tbody>
</table>

Table 3. Descriptive statistics and internal consistency for child Doll Play narrative Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean (SD)</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective Parental Help</td>
<td>.09 (2.15)</td>
<td>.88</td>
</tr>
<tr>
<td>Exaggerated Attachment Themes</td>
<td>-.50 (1.67)</td>
<td>.66</td>
</tr>
</tbody>
</table>
Appendix D: Maternal Behaviour Q-Set- Preschool (MBQS-Preschool)

Pederson, Bailey, Bento, Xue & Moran, 2013

Detailed explanations for the following item statements are available in the Maternal Behaviour Q-Sort (MBQS) Manual by Pederson, Moran, and Bento

1. Provides C with little opportunity to contribute to the interaction
2. Awkward and ill at ease during interaction with C
3. Unaware or indifferent to C’s distress or frustration
4. Ignores bids, requests for assistance or attention
5. Conveys information which C understands
6. Accepts C’s initiatives
7. Responds to signals of distress or frustration
8. Content and pace of interaction are set by parent rather than C’s responses
9. Responds with flat affect when interacting with C
10. Non-synchronous interactions
11. Acknowledges C’s positive emotions: joy, excitement, and contentment
12. Skillful in dividing attention between C and competing demands
13. Realistic expectations regarding C’s self-control of affect
14. Praises C, parent takes advantage of opportunity for positive evaluation
15. Is comfortable in close contact or physical proximity
16. Mislabels C’s affect
17. Delights in C
18. Annoyed, irritated, or impatient with C
19. Emphasizes parent’s needs and wishes
20. Offers acceptable alternatives to divert attention from inappropriate activity
21. Inflexible when interacting with C
22. Builds on focus of C’s attention
23. Structures activities to provide opportunities for C to be successful or satisfied
24. Makes verbal commands of C
25. Well resolved interactions; interaction revolves around C’s tempo and current state and ends when C is satisfied