Validation of the *Preschool Attachment Rating Scales* and Demonstration of their Utility to Understand how Preschool Child-Mother and Child-Father Attachment Promote Children's Social Adaptation

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“We will not be turned around or interrupted by intimidation, because we know our inaction and inertia will be the inheritance of the next generation. Our blunders become their burdens. But one thing is certain, if we merge mercy with might, and might with right, then love becomes our legacy, and change our children’s birthright.”

— Amanda Gorman, 2021 presidential inauguration

“Women will have achieved true equality when men share with them the responsibility of bringing up the next generation.”

— Ruth Bader Ginsburg

“Always aim high, work hard, and care deeply about what you believe in. And, when you stumble, keep faith. And, when you’re knocked down, get right back up and never listen to anyone who says you can’t or shouldn’t go on.”

— Hillary Rodham Clinton, 2008 presidential campaign

Abstract

Attachment theory is a core theory of child development. The theory proposes a framework to understand how children's early relationships to their caregiver shape children's lifelong development. Most attachment research, however, is limited to categorical assessments of infant-mother attachment. This results in a reductionist understanding of children's development, one that rests on a number of questionable assumptions. From an assessment perspective, categorical measures of attachment assume that all children fit neatly into a fixed number of categories, and that all children within a category present similar attachment behaviors. From a developmental perspective, a focus on infant attachment assumes little change in children's caregiving environments, and this, despite evidence showing that changes may occur between infancy and the preschool years. Such changes influence child-caregiver attachment relationships. From a caregiver perspective, children's relationships with their mothers are influential, but they do not span the gamut of children's early relationships. Fathers, for example, are increasingly involved in child rearing and are influential in children's development.

This dissertation sought to overcome these limitations through the use of the *Preschool Attachment Rating Scales* (PARS), a novel, continuous measure of child-caregiver preschool attachment. The first study demonstrated the reliability and validity of the PARS as a measure of child-mother and child-father preschool attachment. This study examined the inter-rater reliability, the convergent validity, the construct validity, the predictive validity, and the incremental validity of the PARS. The second study used a longitudinal design to examine the independent and interactive influence of child-mother and child-father attachment in the preschool years on boys' and girls' externalizing behaviors in middle childhood. This latter study showed that the prediction of externalizing behavior varied as a function of children's and

parents' genders, as well as the attachment pattern (e.g., security, avoidance). Taken together, this dissertation shows that a continuous measure of attachment can help uncover the complexity of different attachment patterns, and in turn, provide a more nuanced understanding on how such patterns affect children's social, emotional, and psychopathological development.

Keywords: child-mother attachment, child-father attachment, preschool years, validation, externalizing behaviors

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Statement of Co-Authorship

I prepared both articles presented in this dissertation in collaboration with my PhD supervisor, Dr. Jean-François Bureau. Both studies relied on data collected as part of his longitudinal study on child-parent relationships and child socioemotional adaptation, which was funded by two Insight Grants awarded by the Social Sciences and Humanities Research Council of Canada (SSHRC) (No. 410-2009-0724 and 435-2013-0230).

The first article (Chapter 2), entitled "Validation of the Preschool Attachment Rating Scales with child-mother and child-father dyads", was published in 22nd volume of *Attachment and Human Development* (DOI: 10.1080/14616734.2019.1589546). The version presented in this dissertation is a slightly modified version of the published article. I contributed to the Time 1 data collection for this study. I also conceptualized the research question, planned and performed the analyses, wrote the manuscript, and revised the manuscript for publication. Authors of this article include Dr. Jean-François Bureau, Dr. Kim Yurkowski, and Dr. Ellen Moss. Their role consisted of assisting with the attachment coding and revising the final manuscript. Dr. Bureau and Dr. Yurkowski assisted in coding the PARS for inter-rater reliability. Their contributions helped ensure that I did not code both parents from a same family. Dr. Moss coded attachment using the gold-standard measure, the PACS, which allowed the team to test construct validity. She also developed the coding manual of the PARS.

The second article (Chapter 3), entitled "Do child-father and child-mother preschool attachment predict boys' and girls' externalizing behaviors in middle childhood?", was submitted for publication in a developmental journal. I led the data collection of the Time 2 assessment for this study; I conceived of the research question, planned and performed the analyses, and wrote

the manuscript. Authors on this article include Dr. Jean-François Bureau and Dr. Kim Yurkowski, who assisted with the attachment coding and revising the final manuscript.

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CHAPTER 1 (General Introduction)

Attachment theory, developed by John Bowlby and Mary Ainsworth, is one of the most significant areas of child development research. One commentator suggests that attachment theory represents "arguably the most important theoretical achievement in the scientific investigation of mother-child love relationships ever" (Dixon, 2015, p. 128). Since its inception, attachment theory has spawned an expansive research agenda that uncovers the importance child-caregiver relationships and the lifelong effects that ensue. Child-parent attachment predicts different developmental trajectories in children, notably in the spheres of social, emotional, and psychopathological development.

Different attachment patterns lie at the core of these developmental trajectories. In the early days of attachment theory, these patterns were conceptualized as differences in kind, and not in levels (Ainsworth et al., 1978). This approach encouraged the use of categorical measures of attachment, which require researchers to classify complex attachment dynamics into a set number of categories (e.g., three in Ainsworth et al., 1978), depending on the measure. Scholars now question this categorical conceptualization of child-parent attachment. These scholars ground their criticism in theoretical approaches and empirical evidence. They argue that child-parent attachment is represented better with continuous than categorical measures (e.g., Fraley & Roisman, 2014; Fraley & Spieker, 2003; Roisman et al., 2007). A continuous measure of attachment can uncover specific correlates of different attachment patterns, thus providing a nuanced understanding of these patterns' effects on social, emotional, and psychopathological development.

This dissertation helps advance attachment theory's ambition toward continuous measures by focusing on preschool child-caregiver relationships. The dissertation provides evidence for the validity—and demonstrates the particular utility of the *Preschool Attachment*

Rating Scales (PARS; Moss et al., 2015), a continuous measure of preschool child-caregiver attachment. The dissertation proceeds in four chapters. The current chapter presents the theoretical foundations of attachment theory with a special focus on preschool attachment, child-father attachment, and continuous measures of attachment. This chapter, in effect, introduces the framework that drives the dissertation's two empirical studies.

The second chapter presents the dissertation's first empirical study, which demonstrates the reliability and validity of the PARS to measure preschool child-mother and child-father attachment. This study notably provides evidence for the instrumental value of the PARS in relation to a categorical measure of preschool attachment, parental sensitivity, and externalizing behaviors in children.

The third chapter presents the dissertation's second empirical study, which applies the PARS to predict boys' and girls' externalizing behaviors in middle childhood. This study provides further evidence of the practical utility of the PARS.

The fourth and final chapter discusses the dissertation's contributions toward advancing continuous measures of child-parent attachment, and, more broadly, attachment research.

Attachment Theory

Theoretical and Empirical Foundations

Attachment theory, or the theory of how human children form strong emotional bonds (attachments) with their caregivers, is the fruit of the forty-year "interdigitated… partnership" between Bowlby and Ainsworth (Ainsworth & Bowlby, 1991, p. 333). The partnership first began with Bowlby's observational and theoretical work. Drawing on psychoanalysis as a "frame of reference" (Bowlby, 1969/1982, p. xxxi), Bowlby believed that childhood is a sensitive period during which experiences have a long-lasting effect, especially in regard to

psychopathology. His observations of vulnerable children, including children evacuated during World War II (Bowlby et al., 1939), clinically referred children (Bowlby, 1944), and hospitalized children (Bowlby et al., 1952) kindled an interest in children's experiences with their caregiver. He noted a pattern whereby children who experienced long-term separations from their mother protested and cried upon separation, followed by a display of prolonged sadness, which Bowlby called despair, and finished with detachment during the mother's absence. (Bowlby, 1973). Children were angry and rejected the mother upon her return. Bowlby sought to explain how a child, who has their needs met by a non-caregiver adult, experiences negative emotions and long-term sequelae due to a separation from their mother. Bowlby (1969/1982) was dissatisfied with the psychoanalysts' and secondary drive theorists' explanations of the effects of separation. Bowlby thereby expanded his theoretical framework to include elements of ethology, evolution theory, systems theory, and cognitive theory (see Duschinsky, 2020, for a more thorough discussion of Bowlby's theoretical influences).

Ainsworth built on Bowlby's work by expanding the empirical basis of attachment theory. Ainsworth's work on attachment theory started when she worked as a postdoctoral researcher for Bowlby in the 1950s. She later drew from attachment theory to conduct comprehensive observations of children living in rural areas of Uganda (Ainsworth, 1967). Upon her return in the United States, Ainsworth devised a landmark study of white middle-class children in Baltimore (Ainsworth et al., 1972), which forms the empirical basis of attachment work to this day. In addition, Ainsworth and Bowlby exchanged considerable correspondence in which they discussed and challenged each other's views of attachment (see Duschinsky, 2020). The sum of these contributions birthed attachment theory as we know it.

Operationalization of Child-Caregiver Attachment

Attachment theory is at heart an account of how children seek proximity from and form an attachment bond with an *attachment figure*. Drawing on ethological notions of behavioral drives (Hinde, 1956) and imprinting (Lorenz, 1937), Bowlby (1969/1982) posited that children are 'biologically primed' to become attached to their caregiver. Bowlby added to this idea the notion of behavioral systems (Baerends, 1976) and further postulated that the behaviors, emotions, and cognitions aimed at promoting caregiver proximity are organized into a behavioral system of attachment. Bowlby believed that moments of need or distress activate a child's attachment system, which prompts proximity-seeking behavior (Bowlby, 1969/1982, 1973, 1980). Countless instances of activation of the attachment system may occur over the course of children's early years. Children may be hungry, tired, scared, or hurt, for example. In such cases, children are biologically primed to alert their attachment figure for help or comfort. Despite being "built-in… [and] genetically determined" (Bowlby, 1965), the attachment behavioral system, particularly its assemblage, is dependent upon experience (Duschinsky, 2020). An attachment figure may—or may not—respond to a child's bid for attention in the same manner as other caregivers, and therein lies the environmental influence on child-caregiver attachment.

The caregiver's sensitivity and responsiveness to a child's bid for attention are the primary environmental influences of child-parent attachment (Ainsworth, 1969). Sensitive caregivers pay attention to their child's signals, interpret the signals accurately, and respond to the signal in an appropriate and timely manner. In contrast, insensitive caregivers may fail to notice, fail to respond, or provide a delayed response to the child's signal. Their response may be inappropriate, notably if the caregiver misinterprets the signal in the context of their own needs instead of the child's needs. The culmination of these varying environmental influences has life-long effects on the child in the form of different attachment expression. Different expressions, or

attachment patterns, may contribute to different trajectories of social and emotional development, and may create risk psychopathology (e.g., DeKlyen & Greenberg, 2016; Fearon et al., 2010; Groh et al., 2012, 2014; Madigan et al., 2013).

In attachment theory, the concept of attachment patterns is operationalized in terms of *security* and *insecurity*. Children are more likely to develop a secure, or positive, attachment bond when their caregiver is sensitive (Ainsworth et al., 1978). On an inferential basis, secure children appear confident in their caregiver's ability to provide a *safe haven* in which comfort and reassurance may be provided. Secure children also seem to derive said comfort from the caregiver. Moreover, these children are able to resume exploratory behaviors such as playing, because their caregiver provides a *secure base* to support their exploration. In contrast, children who experience insensitive caregiving are more likely to develop an insecure attachment to their caregiver. Children may develop an insecure attachment if they are unable to trust their caregivers as safe havens in times of need. These children may, alternatively, be unable to derive comfort from their caregivers. Children in these situations may be incapable of returning to exploratory behaviors and incapable of using the caregiver as a secure base. The concepts of secure and insecure attachments lie at the core of empirical research examining the influence of child-caregiver attachment on later adaptation.

The Importance of a Secure Attachment for Child Development

Bowlby (1969/1982, 1973, 1980) believed that inner cognitive structures called *internal working models* (IWM) explain how children's attachment relationships come to shape their development. The concept of IWM draws from cognitive and representation process theories of that time period (see Gardner, 1986). Bowlby (1973) conceived of IWM as cognitive structures and representations that contain expectations about the caregiver's availability and their expected

responses. Children's IWM also informs whether the child feels accepted by the caregiver. Take the example of a child who consistently receives adequate, prompt, and sensitive support from their caregivers in moments of need. The IWM of that child may see the child as worthy of help and love, and have an expectation that "When I need help, others help me." In contrast, a second child who experiences rejection to their bids of attention from the caregiver may have IWM marked by unworthiness and an expectation that "When I need help, others do not provide it. I need to rely on myself instead." The content of IWM related to self-worth and their defense processes are expected, much like attachment patterns, to contribute to the development of psychopathology and to broader child development (Bowlby, 1969/1982).

The relevance of attachment theory for child development research is striking when we consider the role of attachment security in predicting later outcomes. Bowlby (1969/1982, 1973, 1980) expected that attachment would predict children's social, emotional, and social cognition development. Decades of subsequent research have confirmed his expectations. Secure children, for example, are better able to regulate their emotions than insecure children (Thompson, 2016). Within the context of attachment relationships, secure children learn to understand, express, and discuss their emotions with the support and acceptance of their caregiver, which form the basis of the emotion regulation skills. Such skills may explain why secure children, when compared to insecure children, have greater interpersonal skills (Groh et al., 2014; Pallini et al., 2014). Secure children are also more competent in social problem-solving tasks (Raikes & Thompson, 2008). Meta-analytical evidence suggests that the benefits of a secure attachment may also be generalized to language development (van IJzendoorn et al., 1995). Plausible reasons for this association may be that secure children and their caregivers are more engaged, which affords

them more opportunities to interact and communicate than insecure child-caregiver dyads (Moss et al., 2001; van IJzendoorn et al., 1995).

Attachment security is considered a protective factor for psychopathology, while attachment insecurity is a risk factor (DeKlyen & Greenberg, 2016). Meta-analytic studies show that secure children present fewer externalizing (Fearon et al., 2010) and internalizing behaviors (Groh et al., 2012; Madigan et al., 2013) than their insecure counterparts. These results show that insecure children may be more at risk of developing disorders that impair everyday functioning, such as increased anxiety (Colonnesi et al., 2011) and depressive symptoms (Bureau et al., 2009). Moreover, some patterns of insecure attachment put children at risk of later major psychopathology symptoms, such as dissociation and borderline personality disorder (Carlson, 1998; Ogawa et al., 1997; Shi et al., 2012). These studies are indicative of the implications of attachment theory for child-caregiver relationships and positive child development.

The Empirical Assessment of Infant-Caregiver Attachment

The Strange Situation Procedure

Ainsworth devised the Strange Situation Procedure (SSP), the traditional procedure to assess infant-caregiver attachment. The SSP is an empirical laboratory-based procedure that allows to distinguish qualitative differences in 12- to 20-month-old infants' attachment to their caregiver (Ainsworth et al., 1978). The traditional Ainsworthian SSP consists of eight increasingly stressful episodes that combine "natural cues of danger" (Bowlby, 1973). The goal of the SSP is to activate infants' attachment systems in ways that are similar to everyday activations at home with the goal of capturing infants' attachment, proximity-seeking, and exploratory behaviors (Ainsworth et al., 1978). Ainsworth ensured that the SSP taped in similar attachment behaviors as those exhibited by children during home observations that she

conducted with infant-mother dyads in Baltimore (Ainsworth et al., 1978). The natural cues to danger of the SSP include the unfamiliarity of the laboratory environment, the presence of a stranger, and the temporary separation from the caregiver. These cues are all likely to provoke anxiety in an infant. Infants show different behaviors in reaction to the anxiety induced by the SSP. These behaviors are expected to reflect infants' attachment patterns, or the organization of their attachment behavior (Sroufe & Waters, 1977), toward their caregiver. While other attachment procedures have since been developed for different age groups and observation contexts, the SSP remains a gold standard in attachment research.

The Organized Attachment Patterns

Trained researchers use video-recordings of the SSP to *code* infant-caregiver attachment. The assessment relies on the infants' reaction to the separation from—and the reunion with the caregiver. Separations and reunions are performed in the presence and in the absence of a stranger. Ainsworth and her colleagues (1978) identified three *organized* attachment patterns, or categories: secure (B), insecure-avoidant (A), and insecure-resistant (C). Secure, avoidant, and resistant infants vary in important ways in the attachment behaviors they use to ensure the proximity of their caregiver. However, these patterns are said to be organized in that they reflect a "single attentional focus" for ensuring the caregiver's proximity (Main, 1995).

The traditional Ainsworthian system asks coders to examine the SSP for evidence of one of these three attachment patterns. For instance, during the SSP, secure infants signal their distress directly and openly, and seem to be comforted by the caregiver. Secure infants typically resume exploration once comforted; should they need assistance or comfort during the exploration, these infants are able to seek out the caregiver. Avoidant infants behave differently during the SSP. They show little distress related to the separation and reunion with the caregiver.

Avoidant infants explore independently without involving the caregiver; exploration seems to be the child's focus. Scholars believe that avoidant infants show independence and autonomy as to hide their distress from a caregiver who may be rejecting in moments of need (Ainsworth et al., 1978). In contrast, resistant infants seem highly distressed by the separation from the parent. Resistant infants do not seem to derive comfort from the parent's return; these infants instead struggle to resume exploration. Researchers expect that these infants experience inconsistent care from their caregiver (Ainsworth et al., 1978; Cassidy & Berlin, 1994). As a result, resistant infants may exaggerate their distress and emphasize their dependency upon the caregiver in order to receive adequate attention. Based on these clues, coders may classify a child's attachment to their caregiver into one of the three categories for the purposes of attachment research or clinical practice.

The Disorganized Attachment Pattern

As the use of the SSP grew among the attachment community, Mary Main's Berkeley research group identified disorganization as a fourth attachment pattern. Following the publication of Ainsworth's seminal study (Ainsworth et al., 1978), research groups across the United States and even in Germany sought to replicate her results, including Main, one of Ainsworth's former students (Duschinsky, 2020). Main noted that some infants present conflicted behavior during the SSP. The behaviors were odd, disoriented, or contradictory. Such behaviors are even more common in high-risk populations and in maltreated children. The existing ABC coding system generally led to two outcomes with such cases: (a) they were deemed unclassifiable, for the infants failed to present behavior indicative of a secure, avoidant, or resistant classification; or (b) they were classified as secure because they initiate an approach when the caregiver returned, although this approach was sometimes interrupted or accompanied

by contradictory behaviors. Hinde's work (1956) identified analogous conflicted behaviors in animals, which inspired Main and her group to theorize a novel disorganized (D) classification for infants presenting conflicted behavior (Main et al., 1986).

The protocol to code disorganized attachment identifies a set of behaviors that ought to be considered disorganized (Main et al., 1990). These behaviors include "sequential" or "display of contradictory behavior"; "undirected, misdirected, incomplete, and interrupted" behavior; "stereotypies, asymmetrical movements, mistimed movement, and anomalous postures"; "freezing, stilling, and slowed" behavior; "direct indices of apprehension" of the caregiver, and "direct indices of disorganization or disorientation" (Main et al., 1990, pp. 135–140). These disorganized behaviors reflect the collapse or absence of an attachment strategy. Main and Hesse (1990) explained that disorganized infants experience an unresolvable paradox, wherein the caregiver represents a safe haven and a source of fear, simultaneously. Their explanation supported by meta-analytical evidence that reveals an association between disorganized attachment and anomalous caregiver behavior (r = .34, k = 9, N = 644; Madigan et al., 2006). Such anomalous behaviors include: non-abusive threatening, dissociative, frightened, disrupted, and extremely insensitive caregiving behaviors during infant-parent interactions such as the SSP (see Main & Hesse for a description of the FR-coding system and Lyons-Ruth et al., 1999 for a description of the AMBIANCE coding system of anomalous behaviors). Such experiences of "fright without solution" (Hesse & Main, 2006, p. 312) are likely to promote the rise of disorganized behaviors in infants.

Current Challenges in the Field of Attachment Theory

The early iteration of attachment theory suffers from several important limitations, many of which remain to this day. Three limitations are most relevant for the purposes of this

dissertation: (a) a focus on infancy to the detriment of other important developmental periods including the preschool years; (b) a fixation on attachment to mothers over other influential attachment figures such as fathers; and (c) a reliance on rigid attachment classifications, which present substantial limitations that may be mitigated through the use of continuous measures of attachment. The following sections explain each of these limitations in turn.

Attachment in the Preschool Years

The attachment field remains, on the whole, focused on infant attachment and is less attentive to attachment in later developmental periods. One such neglected period is the preschool years (i.e., ages 3 to 5), despite the existence of valid measures of preschool attachment. For example, a meta-analysis on child-mother attachment and externalizing behaviors identified 12 studies (N = 708 preschoolers) that assessed preschool attachment with the gold standard separation-reunion procedure, a modest figure when compared to the 43 studies (N = 4,488 infants) that assessed infant attachment using the SSP (Fearon et al., 2010). This disparity is all the more concerning given that the preschool years represent an important developmental period for socialization, as well as cognitive, self-regulation, and brain development (T. T. Brown & Jernigan, 2012; Bureau et al., 2019).

Two primary reasons support the view that attachment remains critical for children's development during the preschool years. First, the core attachment concepts of caregiver support and protection are still relevant for preschoolers, who have not yet achieved autonomous maturity (Cicchetti et al., 1990). Preschoolers need their caregiver for comfort in moments of need, for help and support in daily activities, and for help in emotional regulation. In short, preschool-aged children need their caregiver to act as a safe haven and a secure base, although the precise manifestations of the attachment system differ when compared to those of infants.

Second, an infant's attachment is not immutable. It may change as the infant ages (Cicchetti et al., 1990). Various events may occur during the preschool years that may alter a child's attachment or reduce the stability of attachment from one period to the next. Such events include the loss or serious illness of a family member, the birth of a sibling, or the separation of parents (see Moss et al., 2005). Preschool-aged children also develop a desire for increased autonomy, along with better perspective-taking and communication skills, all of which may alter their own reactions and those of caregivers during interactions. In fact, a recent meta-analysis shows that the stability of secure, avoidant, ambivalent, and disorganized attachment from infancy to the preschool years is only small to moderate ($r = .31$, $k = 9$, $N = 720$; Opie et al., 2020). There is therefore a need to explore preschool attachment further in order to understand how it predicts concurrent outcomes and later development.

The following subsections will describe (a) how attachment manifestations differ in the preschool years, (b) the transition of infant disorganization in the preschool years, and (c) the separation-reunion procedure and the Preschool Attachment Coding System (PACS), the gold standard procedure and measure of preschool attachment. These steps will help clarify the particularities of preschool attachment.

Attachment Manifestations in the Preschool Years. Preschool children manifest their attachment behavior differently than infants, notably due to their increased verbal and cognitive capacities (Bureau et al., 2019). For example, the notion of proximity is different for an infant and a preschooler. A distressed infant seeks to achieve physical contact to be soothed. A preschooler, on the other hand, does not always need physical proximity to be comforted; they may be reassured by a verbal interaction with the caregiver, or even a glance at the caregiver (Cassidy et al., 1992). The adaptive functions of the attachment behaviors remain consistent over

time, although their discrete manifestations may evolve to reflect the development level of the child (Sroufe & Waters, 1977).

Another important distinction for preschool attachment is the concept of *goal-corrected partnership* (Bowlby, 1969/1982; Cassidy et al., 1992). Preschool-aged children and their caregiver may become active partners in play and in everyday life—partners that hold different desires, goals, and emotions. Preschoolers' increased perspective-taking skills help them understand that the caregiver may have their own agenda. A key aspect of preschool attachment lies in how the dyad negotiates their goals and communicates (successfully or not) to form a joint plan.

The specific behaviors that reflect secure, avoidant, and ambivalent attachments differ in the preschool years, but their underlying functions remain similar from infancy to the preschool years (Cassidy et al., 1992). Secure children display a calm enjoyment of the caregiver's presence. They maintain a goal-corrected partnership that considers the caregiver's perspectives and ideas. Secure children may express distress upon separation and may need the caregiver's assistance. In such cases, they are comfortable expressing their needs and may be calmed by the caregiver. Avoidant children try to maintain neutrality during their interactions with the caregiver. The interactions focus on toys and exploration and remain impersonal. Avoidant children may respond to a caregiver's request or bid for attention, but they usually do so through brief, neutral responses. Such a response appears more efficient to maintain neutrality than blatantly ignoring the caregiver, which could create a conflict. Ambivalent children (the equivalent of the resistant infant classification) appear overly dependent upon the caregiver, to the detriment of exploration. Some ambivalent children exaggerate their distress and seek close physical contact to the parent. Even if comforted, they may be unable to return to exploration

that is typical of children their age. They may instead exhibit rudimentary play or relying on the caregiver to take charge of the interaction. Other ambivalent children engage in conflictual interactions with the caregiver. These interactions are marked by frustration and resistance. The dyad does not achieve a joint plan because they fail to agree and negotiate their plan. These two ambivalent strategies hinder children's exploration and the progress of the dyadic interaction. Despite different behavioral manifestations, the functions of organized attachment remain similar to the original Ainsworthian description of these attachment patterns.

Disorganization in the Preschool Years. A major difference between infant attachment and preschool attachment lies in the disorganization attachment pattern. Disorganization in the preschool years includes different manifestations, or subgroups, of disorganization: 'behavioral disorganization', controlling-caregiving, and controlling-punitive.

A majority of disorganized infants develop controlling behaviors toward their caregiver in the preschool years (Main & Cassidy, 1988; Moss et al., 2005). Controlling behaviors are the means by which a child takes charge of the dyad, creating a *reversal of the roles* in the child-caregiver relationship. This role reversal may allow the child to have more control with an otherwise unpredictable caregiver who may be frightening (Solomon et al., 1995). Indeed, the child is less likely to experience fear when they direct the caregiver's attention and organize the caregiver's actions. Children exhibiting controlling behaviors may seem to have an attachment strategy that is more optimal than that of disorganized children, however, controlling attachments are maladaptive. Or as Bowlby (1969/1982) notes, "the reversal of roles between child, or adolescent, and parent, unless very temporary, is almost not only a sign of pathology in the parent, but a cause of it in the child" (p. 377).

Children who are involved in a role-reversed dyad present one of two controlling attachments: a controlling-caregiving attachment based on the provision of care to the parent, or a controlling-punitive attachment based on humiliating or being hostile toward the parent (Cassidy et al., 1992). Controlling-caregiving children direct the caregiver's attention and behaviors through cheery, entertaining actions and demeanor. These children are focused on their caregiver's needs, which may lead them to minimize and forget their own needs. In contrast, controlling-punitive children seek to direct the interaction through punitive, threatening, humiliating, and hostile commands and behaviors. These children actively or passively act in ways that are derogatory or restricting to the parent.

The other subgroup of disorganized preschool attachment is behavioral disorganization. Approximately a third of disorganized infants continue to exhibit disoriented, contradictory, and apprehensive behaviors toward their caregiver as they grow into the preschool years. Children who continue to display such overt displays of fear are classified as "behaviorally disorganized" (e.g., Moss, Cyr, et al., 2004; Moss et al., 2005; O'Connor et al., 2011), a term used to distinguish their behavior from the broader disorganization classification. The defining characteristics of behavioral disorganization in the preschool years are in line with the description of infant disorganization (Main et al., 1990; see p. 10).

The three subgroups of preschool disorganization are often combined into a single disorganized group, despite some evidence showing that the types of disorganization predict different correlates. There are currently very few samples that have distinguished between behaviorally disorganized, controlling-caregiving, and controlling-punitive attachments. One challenge in the way of making such comparisons is achieving sufficient statistical power. Some

samples may only have a handful of disorganized children, let alone behaviorally disorganized children, thereby preventing any further investigation comparing the disorganized subgroups.

To our knowledge, only two samples distinguished between disorganized subgroups: Ellen Moss' sample of French-Canadian child-mother dyads from diverse socioeconomic backgrounds and the National Institute of Child Health and Human Development (NICHD) study of Early Child Care Research Network (ECCRN), which included a national representation of child-mother American dyads. Moss, Cyr, and colleagues (2004) compared 12 controlling-caregiving, 12 controlling-punitive, and 12 behaviorally disorganized children. Mothers of controlling-caregiving children considered their child well-adapted and reported a decrease in parenting stress over a two-year period, when their children were 4 years old and 6 years old. Mothers of controlling-punitive children, on the other hand, experienced an increase in parenting stress and considered their child hyperactive and demanding. There was no difference across time in the parenting stress levels of mothers of behaviorally disorganized children. These mothers nonetheless differed from mothers of other disorganized children (i.e., controlling-caregiving and controlling-punitive) in that they reported a dysfunctional marital relationship (Moss, Cyr, et al., 2004). This study also reported that controlling-punitive children and, to a lesser extent, behaviorally disorganized children showed higher externalizing behaviors than secure children. Controlling-caregiving children presented similar levels of externalizing behaviors to those of secure children. However, controlling-caregiving children presented higher levels of internalizing behaviors than secure children (Moss, Cyr, et al., 2004). Children in the three disorganized subgroups in this sample continued to exhibit different outcomes in adolescence (Lecompte & Moss, 2014).

A majority of Moss' results were replicated with larger numbers in the NICHD ECCRN sample, which compared 85 behaviorally disorganized children, 43 controlling-caregiving children, and 26 controlling-punitive children (O'Connor et al., 2011). Mothers of behaviorally disorganized children presented significantly lower levels of romantic relationship quality than mothers of controlling children. There were no differences regarding maternal depression and maternal parenting stress variables among the three disorganized subgroups. Among these subgroups, controlling-punitive children were reported by their mothers as having the highest levels of disruptive behaviors, internalizing behaviors, and externalizing behaviors at 36 months. At 54 months, teachers of behaviorally disorganized and controlling-punitive children reported high levels of externalizing behaviors, while controlling-caregiving children exhibited low levels of externalizing behaviors comparable to those of secure children (O'Connor et al., 2011). From these studies, one could assume that controlling-caregiving children are relatively well-adapted. Scholars, however, urge caution against this conclusion. The controlling-caregiving attachment pattern seems to become particularly insidious as children grow older. Adolescents and young adults with a controlling-caregiving attachment may experience difficulty in forming an identity that is distinct from the parent (Meier & Bureau, 2018). They may also have more difficulty in forming healthy friendships and romantic relationships. Among the limited available research, reports show that, at 20 years old, controlling-caregiving young adults present more suicidal ideation and self-injury behaviors than those who present an organized attachment (Lyons-Ruth et al., 2009). These studies, despite being limited in sample size, show that the three disorganized subtypes of preschool attachment differ in important ways. This topic remains underdeveloped and thus requires further research.

Measuring Preschool Attachment. Preschool attachment is measured in a similar fashion to infant attachment, although there are some modifications to account for differences in age and attachment manifestations. First, the procedure to measure preschool attachment relies on a modified SSP, called the separation-reunion procedure (Cassidy et al., 1992). The SSP and the separation-reunion procedure differ insofar as the latter does not include a stranger. In the SSP, the stranger first interacts with the caregiver before interacting with the child. For an infant, the stranger signals danger even if they are friendly toward the caregiver. In contrast, a preschool-aged child is more likely to consider a friendly stranger a playmate, which defeats the purpose of including a stranger in the procedure. The length of each episode is another difference between the procedures. The separation-reunion procedure increases each episode's time from three to five minutes. The longer separations in the separation-reunion procedure help ensure the activation of the children's attachment system. The rest of the procedure is similar: both procedures include a pre-separation as well as two consecutive separations and reunions from the caregiver.

The gold standard measure to code preschool children's attachment behaviors in the separation-reunion procedure is the *Preschool Attachment Coding System* (PACS; Cassidy et al., 1992). The PACS was developed by the *MacArthur Attachment Working Group*, a group of 24 influential attachment researchers including Ainsworth, Main, Cassidy, and Marvin. The PACS, much like the original Ainsworth system (Ainsworth et al., 1978), relies on classifications (i.e., mutually exclusive categories) for each of the six patterns of preschool attachment: secure, avoidant, ambivalent, behaviorally disorganized, controlling-caregiving, and controlling-punitive. The secure, avoidant, and ambivalent classifications are further divided into subclassifications (e.g., B3 for children who only show markers of security, B1 for children who

are primarily secure but show some markers of avoidance, B4dep for children who are primarily secure but show some markers of ambivalence). Coders automatically rate subclassifications during their coding process. The subclassifications are rarely used for two main reasons. First, the certification process does not require coders to achieve reliability on subclassifications. Second, most samples are too small to allow this level of subdivision within children of a classification.

Numerous studies attest of the PACS' validity as a measure of child-caregiver attachment. The PACS presents convergent validity with other attachment measures such as attachment representations (Bretherton, Ridgeway, et al., 1990) and Q-Sort secure-base behavior (Moss et al., 2006). The PACS is associated with key variables, such as parental sensitivity (De Wolff & van IJzendoorn, 1997; O'Neill et al., 2021), maternal well-being (Badovinac et al., 2018; Manassis et al., 1994; Moss, Bureau, et al., 2004), and the quality of child-mother interactions (Barnett et al., 1998; Moss, Bureau, et al., 2004). The PACS also holds adequate predictive validity in its ability to predict children's socioemotional adaptation (Badovinac et al., accepted; Bureau & Moss, 2010; Moss, Bureau, et al., 2004; O'Connor et al., 2011). These results show why the PACS is considered the method of choice to assess qualitative differences in child-caregiver attachment during the preschool years (McElwain et al., 2012). These studies, however, mostly focused on child-mother dyads.

Child-Father Attachment

Attachment research is limited by the lack of attention directed toward child-father dyads. The paucity of information is apparent from a quick search in PsycInfo conducted in January 2021: the search term "attachment" and "father" returned 954 results, while the search terms "attachment" and "mother" returned 4,252. These results amount to a 4:1 ratio between child-

mother and child-father attachment studies. To use another metric, approximately 10% of articles in the specialized journal *Attachment and Human Development* address child-father attachment (Cowan & Cowan, 2019). Despite a renewed academic interest in fathers over the last 20 years, deep theoretical issues and unanswered questions remain. These issues include the lack of validated measures of child-father attachment, insufficient understanding of child-father disorganization, and limited comprehension of independent and joint influences of child-father attachment on child development.

Initial Skepticism and Renewed Interest for Child-Father Attachment Research.

Research interest in child-father attachment was limited throughout the formative years of attachment research. A misunderstanding of Bowlby's writing is a major reason for the neglect of child-father attachment. The source of confusion rises from his use of the term "monotropy" in his seminal trilogy: "Because the bias of a child to attach himself especially to one figure seems to be well established… In the earlier paper I referred to it as 'monotropy'" (Bowlby, 1969/1982, p. 309). The research community interpreted this segment within the confines of relationship dynamics of the times: children only form an attachment to one attachment figure, the mother. This interpretation precluded consideration of fathers as attachment figures and, thus, as possible research subjects. Bowlby's use of "monotropy," however, only expressed that bonds between child and caregiver are unique; Bowlby's word choice was not meant to preclude bonds with more than one attachment (Duschinsky, 2020). In addition to this unfortunate misunderstanding, Ainsworth's Baltimore study did not include fathers. This was reflective of a time when the role of fathers in the family was seen as that of a husband and a breadwinner, not that of an actively involved caregiver (Lamb, 2014). Duschinsky (2020) explains that "Ainsworth was not ruling out the role of fathers on theoretical grounds, though neither did she

encourage it" (p. 149). The first empirical studies on infant-father attachment were produced, nonetheless, by Ainsworth's former students and collaborators, namely, Kotelchuck and Lamb.

The first studies on infant-father attachment showed that fathers, like mothers, can be attachment figures. Kotelchuck (1976) found that 12- to 21-month-old infants exhibited attachment behaviors to their father similar to those exhibited toward mothers: infants protested the departure of their father, failed to explore their surroundings in the absence of their father, and had positive reactions to their father's return. Lamb (1976a, 1976c) similarly found that distressed infants displayed attachment behaviors to their caregiver regardless of gender. In the presence of both caregivers, 12- and 18-month-olds preferentially sought their mothers for comfort, while 8- and 21-month-olds did not display a systematic preference for one caregiver over the other (Lamb, 1976a, 1976b, 1976c). These studies demonstrated at a relatively early time in attachment research that infants form attachment bonds to mothers and fathers.

Research interest in child-father attachment did not grow in a continuous fashion (Bretherton, 2010), but received sustained interest since 2000 (Schoppe-Sullivan & Fagan, 2020). This coincides with the publication of Natasha Cabrera's canonical piece on fatherhood, which illustrated that recent societal trends such as the increased participation of women in the workforce and of men in child rearing has changed the role of fathers in the family (Cabrera et al., 2000). In Canada, for example, only 21.6% of women participated in the labor force in 1950; 82% did in 2015 (Moyser, 2017). These conditions favored an increase in fathers' participation in childcare. Fathers' involvement has, however, never matched women's growing participation in the workforce. In 1986, one Canadian father in three participated daily in daily childcare. One in two Canadian fathers participated in childcare in 2015 (Houle et al., 2017). These statistics show that women still assume more responsibility for childcare despite also being breadwinners

(e.g., Canadian women spend 30% to 40% more time than Canadian fathers engaged in childcare; Moyser & Burlock, 2018). Nonetheless, in many families, fathers are coparents (Cabrera et al., 2000; Pleck & Pleck, 1997) who help with childcare tasks, participate in making decisions pertaining to their child, and—most importantly for attachment studies—spend time with their child (Lamb & Tamis-LeMonda, 2004). These trends make it harder to "forget about the contributions of fathers to child development" (Lamb, 1975), as exemplified by two recent special issues on child-father attachment (Ahnert & Schoppe-Sullivan, 2020 and Cowan & Cowan, 2019), although research in this field remains scarce in comparison to research on mothers (G. L. Brown & Aytuglu, 2020), especially in the case of longitudinal studies.

Lack of Validation with Child-Father Dyads. Similar to the broad field of fathering research (Cabrera et al., 2018; Fagan et al., 2014), attachment measures are often validated with child-mother dyads and applied to child-father dyads without a comparable validation process for fathers. This process undermines measurement equivalence: the validity of the construct is assessed for child-mother attachment, but the same cannot be said of child-father attachment (Adamsons & Buehler, 2007). Under such circumstances, any differential relation between attachment to mothers and to fathers and other variables (e.g., behavior problems) is not necessarily indicative of a difference between child-mother and child-father attachment. Instead, the difference may be due to the inadequacy of the measure to assess child-father attachment. For this reason, there is a need to validate new attachment measures with child-mother as well as child-father dyads (see G. L. Brown & Aytuglu, 2020; Solomon & George, 2016).

Insufficient Understanding of Child-Father Disorganization. The persistent interest in child-mother disorganization has not translated into research on child-father disorganization. Child-mother attachment research shows that infant disorganization is an important risk factor

for the development of behavior problems and psychopathology (DeKlyen & Greenberg, 2016). Similar associations hold for preschool attachment. Studies conducted in Canada (Moss et al., 2004, 2005) and in the United States (O'Connor et al., 2011) show that behaviorally disorganized and controlling-punitive children present more maladaptive behaviors (e.g., externalizing and disruptive behaviors). The relevance of disorganization to mothers is such that interest in the topic is common in clinicians and policymakers (Forslund et al., 2021; Granqvist et al., 2017).

Despite this keen interest in child-mother disorganization, little is currently known about child-father disorganization and its role in early childhood socioemotional development. This issue arises partly from a general lack of research on child-father attachment, and partly from the common practice of collapsing insecure attachment patterns (avoidant, ambivalent, behaviorally disorganized, controlling-caregiving, and controlling-punitive) into a single insecure group, which prevents the individual analysis of disorganization. To our knowledge, only one study reported specifically on observed child-father disorganization and child outcomes. The study examined the association between attachment at 15 months in a sample of low-risk American families and behavior problems at 6.5 and 8 years old, as rated by the child, the teacher, the mother, and the father (Kochanska & Kim, 2013). Only one association was significant: child-father disorganized attachment at 15 months predicted higher mother-rated externalizing behaviors at 8 years old, even when accounting for child-mother disorganization. There is, to our knowledge, no study that assessed behavioral disorganization and controlling attachments in an observational paradigm in the preschool years. It remains unknown whether similar patterns to those of child-mother dyads are expected in child-father dyads. These patterns suggest that controlling-punitive and behaviorally disorganized children are particularly at risk of

maladaptation. There is thus a pressing need for research on child-father disorganization in order to inform future research, clinical, and policy work.

Limited Comprehension of the Independent and Joint Influences of Child-Father Attachment. An important limitation of existing child-father attachment research is that it assumes a complete independence from child-mother attachment in its influences on child development. This more traditional approach reflects an independent hypothesis framework (van IJzendoorn et al., 1992), which assumes that child-father and child-mother attachment hold completely independent influences. For example, researchers may examine whether child-father attachment security promotes social competence, and whether child-mother attachment promotes social competence. Such questions are important to understand the unique role of child-father attachment in promoting positive development in children, however, the independence hypothesis neglects an important piece of the puzzle. Indeed, parents do not exist in separate silos. There is rather a constant interplay between child-father and child-mother attachment, which are two coexisting—and continuously interacting—relationships.

Family systems theory proposes an alternative approach that better captures the coexisting nature of child-mother and child-father attachment. This theory holds that a family is composed of different interdependent systems that influence one another dynamically (Cox & Paley, 1997). For instance, a family comprises a child-mother system, a child-father system, a mother-father coparenting system, and so forth. There has long been a plea for a family systems approach to the study of attachment (e.g., Cowan, 1997; Cowan & Cowan, 2019; Fagan, 2020). This approach adds to the ecological validity of attachment research and reveals the potential additive and buffering effects of child-mother and child-father relationships.

Under a family systems approach, the main research question expands from ‘Does child-mother and child-father attachment independently predict an outcome?’, to include also ‘How does the configuration of these two attachments also predict this outcome?’ For example, an additive effect may show that children present more optimal outcomes when they present two secure attachments, and worse outcomes with two insecure attachments (Dagan & Sagi-Schwartz, 2018). Children with one secure relationship present worse outcomes that children with two secure attachments, but better outcomes than children with two insecure attachments. Alternatively, a buffering effect may show that having one secure attachment buffers against the effect of an insecure one (Dagan & Sagi-Schwartz, 2018). Children with one or two secure attachments present similar outcomes, while children with two insecure attachments present worse outcomes.

Questions of interactive effects between child-mother and child-father attachment represent an emerging area of research, however, methodological challenges remain, such as the lack of adequate measures to investigate interactive effects (Cox & Paley 2003). For preschool attachment, one such challenge is the reliance on categorical systems. For example, it may be difficult to examine interactive effects in small samples with only a small number of children who present two insecure attachments. Moreover, it is often inconceivable to look at the interactive effects of specific insecure patterns for this same reason; it is hard to imagine a sample large enough to have sufficient children with two avoidant attachments, for instance. In sum, although a family systems approach has the potential to further our understanding of the ways that child-father and child-mother attachment influence child development, there are important limitations in existing attachment measures that may limit our ability to use the family systems approach to its full potential.

The Limitations of Categorical Measures to Assess Child-Caregiver Attachment

Attachment measures to code children's behavior during the SSP or the separation-reunion procedure assume that attachment behaviors vary only in kind, in a qualitative fashion (see Sroufe & Waters, 1977 on the importance of such assumptions for research). This reliance on categorical conceptualizations of attachment dates back to Ainsworth (Ainsworth et al., 1978). Her clinical background guided her preference for attachment categories over scales, along with a conviction that differences in behavior patterns, and not in particular behaviors, were the distinctive features of attachment (Ainsworth & Marvin, 1995). Ainsworth also argued that categories inspired more attention to causal factors and provided a greater focus on the behavioral manifestations of attachment and thus a clearer picture of associated outcomes; however, it remains unclear how categories provide these advantages over scales (Duschinsky, 2020). Despite a conviction that categories are the best method to capture attachment, Ainsworth's method of classifying children's behavior in the SSP relied on first coding continuous scales of interactive behaviors (i.e., avoidance, proximity and contact seeking, contact maintenance, and resistance to contact; Ainsworth et al., 1978), which were then set aside in favor of categories for publication.

The dual coding of attachment categories and scales in the SSP allowed new generations of researchers to question the unilateral use of categories for attachment research. This endeavor was based on the NICHD ECCRN sample (n = 1,139) and involved the use of taxometric techniques (Fraley & Spieker, 2003). Taxometric techniques aim to determine whether members of a group (or in this case, a classification) represent a true distinct type (or *taxon*), or whether continuous dimensions underlie variation within the group (Meehl, 1973). Take the example of attachment security. The categorical nature of attachment security would be supported if there

were (a) little variation among secure children on the interactive scales, and (b) high variation on the interactive scales when comparing secure children to children of other groups (e.g., avoidant). In contrast, the continuous nature of security would be supported provided there was (a) considerable variation among secure children on the interactive scales, and (b) little to moderate variation on the interactive scales between secure children and those of other groups. The application of taxometric techniques to the NICHD ECCRN sample revealed that attachment security, avoidance, and ambivalence are best represented through continuous scales, due to their non-categorical nature (Fraley & Spieker, 2003). The nature of disorganization remains uncertain, as there were too few indicator variables to conduct the taxometric analysis adequately for disorganization (Fraley & Spieker, 2003). It is worth noting, however, that disorganization is frequently reported on a continuous rating scale (e.g., Bureau et al., 2009; Carlson, 1998; Luijk et al., 2011). Overall, the taxometric analysis suggested that continuous measures of attachment may be more valid as they represent better the nature of attachment behaviors.

In addition to the validity argument, proponents of continuous measures of attachment praise the statistical and practical advantages of continuous measures over categorical measures. From a statistical standpoint, categorical measures possess lower statistical power than continuous measures. In a statistical model explaining 25% of the variance, the model may reach 80% power with two continuous predictors, but only 50% power with a dichotomous predictor such as secure-insecure (Fraley & Spieker, 2003). This is especially relevant to attachment research, which often relies on a secure-insecure dichotomy, precisely to maximize statistical power (Solomon & George, 2016). The observational assessment of attachment is time-consuming, costly, and labor intensive, which often prevent the collection of large sample sizes. In the absence of such large samples, it is difficult to distinguish between different types of

insecure attachment patterns, which are lumped into a single insecure group. Any meaningful difference between insecure patterns is thereby omitted for publication (DeKlyen & Greenberg, 2016). This may be especially relevant for avoidant and ambivalent attachments, which only share their insecure nature, but present dissimilar behavioral manifestations and outcomes (Erickson et al., 1985). In the case of preschool attachment, the merger of all insecure attachment patterns also combines behavioral disorganization and controlling attachments despite their inherent differences (see pp. 15–17; Moss, Cyr, et al., 2004; O'Connor et al., 2011). In contrast, continuous measures allow for the distinction between insecure attachment patterns, provided that the scales reflect the patterns (e.g., an avoidant scale to reflect the avoidance pattern). Continuous measures may be more adapted than categorical measures to the identification of underlying mechanisms of maladaptation (DeKlyen & Greenberg, 2016).

From a practical standpoint, classifications assume the absence of individual differences for children within the same classification (Feeney, 2016). This assumes, for example, that all secure children exhibit the exact same behaviors during the SSP or the separation-reunion procedure. In practice, however, the behavioral manifestations of security vary considerably from one secure child to another. Some secure children may present strong indicators of secure behavior and very little behavior indicative of another attachment pattern, while other secure children may present almost as much security as avoidance. These nuances are lost within a single secure group. In addition, the classification process involves the loss of important information to describe accurately a child's attachment behavior. For a child who presents comparable levels of security and avoidance, it is possible that their true attachment lies at the border between these two classifications (Cummings, 2003). Forcing the child into a secure or avoidant classification mischaracterizes their attachment relationship. On a practical note, the

case of borderline children also creates reliability issues between coders. The border between secure-reserved (B1) and avoidant-neutral (A2) is renowned for being less reliable (Main & Cassidy, 1988; Speltz et al., 1990), while some go as far as saying that classification of such a borderline case is arbitrary (Duschinsky et al., 2020). For these reasons, continuous measures of attachment may characterize individual differences in attachment and borderline cases than categorical measures of attachment.

Continuous measures of attachment hold advantages over categorical measures of attachment; this prompted the development of a number of continuous measures. One of the most popular and well-validated continuous measure of attachment is the *Attachment Q-Sort* (AQS; Waters & Deane, 1985). The classic AQS procedure relies on home observations of a 12- to 48-month-old infant and their caregiver. An observer (who may be a research assistant or a parent) sorts 90 statements based on how descriptive they are of the child's attachment behaviors. The sort of statements is then correlated with the sort of a prototypical child. This measure yields a single security score ranging from highly insecure (-1) to highly secure (+1). The AQS is a compelling continuous measure of attachment in the preschool years, but it lacks specificity concerning the insecure attachment patterns. From the AQS score, it is impossible to derive whether a child presents more avoidant, ambivalent, or disorganized behaviors, for example. This is an important limit given the different developmental correlates of insecure attachment patterns (see e.g., Erickson et al., 1985; Groh et al., 2017, O'Connor et al., 2011). Valid continuous measures of attachment that include individual scales for each attachment pattern exist, but they are limited to the assessment of attachment in middle childhood (e.g., the *Middle Childhood Attachment Scales*, Brumariu et al., 2018). There is currently no valid,

continuous measure of attachment in the preschool years that allows to distinguish between insecure attachment patterns.

The Present Dissertation

The purpose of this dissertation is to providence evidence for the validity of a new continuous measure of preschool attachment, the PARS, and show its utility to address the limitations in the field of attachment described above. The PARS are used to rate 2.5- to 7-year-old children's behavior in the separation-reunion procedure. The PARS include six scales, each of which represents one of the six preschool attachment patterns (secure, avoidant, ambivalent, behaviorally disorganized, controlling-caregiving, and punitive-caregiving). An unpublished coding manual establishes the guidelines to code these scales (Moss et al., 2015). The PARS allow to uncover associations pertaining to each attachment pattern individually to gain a better understanding of the mechanisms by which attachment in early childhood fosters or hinders positive child development.

The first study evaluates the reliability and validity of the PARS to assess child-mother and child-father attachment. The validation strategy is consistent with the guidelines for the validation of novel attachment measures (Solomon & George, 2016). We first assess the inter-rater reliability of the PARS. We explore the intercorrelations between the scales as indicators of construct validity. For example, we may expect the security scale to be negatively correlated with insecure attachment scales. We then demonstrate the PARS' convergent validity with the PACS, the gold-standard measure of categorical attachment. Lastly, we examine the predictive validity of the PARS by showing their association with key variables in attachment research, namely parental sensitivity and child externalizing behaviors. The association of the PARS with this latter variable also shows the incremental validity of the measure over the PACS. This study

answers the need for more research on preschool attachment and for validated measures of child-father attachment. It also advances the field forward in providing evidence for the validity of a new continuous measure of attachment that may be used to answer more specific research questions.

The second study examines whether child-mother and child-father attachment patterns measured through the PARS predict boys' and girls' externalizing behaviors in middle childhood. This study adopts a family systems approach to consider the independent and interactive influence of each attachment pattern on externalizing behaviors in a longitudinal study design. This study highlights the utility of the PARS in addressing unanswered questions in attachment research. Indeed, the use of six independent scales allows researchers to uncover the independent and interactive association between all insecure attachment patterns (including the three disorganization subgroups) and externalizing behaviors. The statistical power of the PARS makes it possible to further detail this relationship with respect to children's gender. In so doing, this study demonstrates how the use of a continuous measure can help advance research in the field of attachment, particularly for child-father attachment.

CHAPTER 2 (Study 1)

Reliability and Validity of the PARS

Based on the article published in *Attachment and Human Development*:

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Abstract

Growing evidence points to the theoretical and statistical advantages of continuous (rather than categorical) assessments of child-caregiver attachment. The *Preschool Attachment Rating Scales* (PARS) is a continuous coding system to assess preschool attachment that is complementary to the categorical *MacArthur Preschool Attachment Coding System* (PACS). The current study aims to evaluate the reliability and validity of the PARS to measure both child-mother and child-father attachment during the preschool period. Participants included 144 preschool-aged children (M = 46.89 months, SD = 8.77; 83 girls) and their parents. Results support the reliability and validity of the PARS: good inter-rater reliability, expected associations between scales, convergence with the PACS, and association with parental sensitivity and child externalizing behaviors. These findings support the application of continuous assessments of child-caregiver attachment in the preschool years. They also align with previous work on child-mother attachment, and present avenues for future research on child-father attachment.

Keywords: preschool period, continuous scales, validity, child-mother attachment, child-father attachment

Validation of the *Preschool Attachment Rating Scales* with Child-Mother and Child-Father Dyads

Attachment theory provides a theoretical framework on how children's early interactions with their caregivers come to shape their subsequent development. Initially centered on infants' attachment to their mothers as measured through the Strange Situation Procedure (SSP; Ainsworth et al., 1978), attachment research has expanded to other developmental periods, caregivers, and assessment methods. A notable recent focus aims to understand the specificity of preschool attachment, an important developmental period for children's socialization and socioemotional development. Although previous work supports continuous assessments of attachment in other developmental periods (e.g., Fraley & Spieker, 2003), the *MacArthur Preschool Attachment Coding System* (PACS; Cassidy et al., 1992—often described as the "gold standard" measure of preschool attachment; Solomon & George, 2016) uses a primarily categorical approach to qualify qualitative differences in child-caregiver attachment, similar to the infant SSP coding system. The current study aims to provide evidence for the reliability and validity of a continuous measure of preschool child-mother and child-father attachment that is complementary to the PACS, the *Preschool Attachment Rating Scales* (PARS; Moss et al., 2015).

Preschool Attachment

The preschool period (i.e., 3 to 5 years old) is characterized by children's socialization beyond the immediate family context, along with considerable growth in linguistic, cognitive, and self-regulatory abilities (Marvin et al., 2016). Generally, fathers play an increased role in child rearing as compared with infancy (Black et al., 1999; Lamb, 2004), making the assessment of child-father attachment in the preschool period especially desirable. Children's developmental

changes during this period are concomitant with behavioral changes in attachment behavior, as compared with infant manifestations. However, the underlying functions of attachment behavior remain similar across these two periods. For example, preschool children are no longer limited to physical contact to achieve proximity with the caregiver (Cassidy et al., 1992) and may initiate verbal interactions to gain comfort or reassurance. Furthermore, enhanced cognitive abilities improve preschool children's perspective taking capacity, allowing them to understand better the caregiver's goals and feelings. These skills are an integral part of a *goal-corrected partnership* in which caregiver and child are able to communicate and negotiate their goals to form a joint plan (Bowlby, 1969/1982).

Although organized attachment (i.e., secure, avoidant, and ambivalent) is similar during the infancy and preschool periods, an important developmental shift occurs for disorganized infants. Some of them continue to display infant-like disorganized and disoriented behaviors such as freezing, contradictory behaviors, and stereotypies (Cassidy et al., 1992). However, most disorganized infants instead develop controlling behaviors in the preschool years (Main & Cassidy, 1988; Moss et al., 2005; Wartner et al., 1994). Role-reversal in the child-caregiver dyad can materialize into distinct forms of controlling behaviors (Cassidy et al., 1992; Main & Cassidy, 1988). Controlling-caregiving children direct the caregiver's attention and behaviors through cheery and entertaining behaviors. They become attuned to their caregiver's needs to the point of minimizing and forgetting their own needs or distress. In contrast, controlling-punitive children control the interaction through punitive, threatening, and hostile behaviors. Solomon and colleagues (1995) posit that controlling behaviors may render interactions with the caregiver more predictable, thus allowing for increased emotion regulation. Although some could argue that controlling behaviors are a step forward from behavioral disorganization, Bowlby

(1969/1982, p. 377) theorizes that "the reversal of roles between child, or adolescent, and parent, unless very temporary, is almost not only a sign of pathology in the parent, but a cause of it in the child".

Limitations Related to Categorical Attachment Assessments

Given the maturation of the attachment system (e.g., greater tolerance to short separations) and differences in behavioral attachment manifestations between the infancy and preschool periods, Cassidy and her colleagues (1992) proposed an adapted SSP for preschool-aged children and an adapted coding system (PACS). Their *separation-reunion procedure* is similar to the traditional SSP yet involves longer stages (5 minutes instead of 3) and uses only the caregiver's departure as an attachment-activating situation (as preschool children tend to perceive strangers as non-threatening playmates).

The PACS, much like the infancy coding system, relies primarily on categorical assessments of attachment, allowing for classification into one of six attachment types: secure, avoidant, ambivalent, behaviorally disorganized, controlling-caregiving, and controlling-punitive. However, scholars dispute the use of categorical attachment measurements. Fraley and Spieker (2003) argue that previous methodological tools (e.g., latent class analysis and cluster analysis) used to address the "categorical vs. continuous debate" 'forced' data into a grouping structure to reveal types. Instead, they suggest using taxometric techniques as they can determine whether members of a group form a true type (or *taxon*; Meehl, 1992). They applied these techniques to the National Institute of Child Health and Human Development (NICHD) sample and found that infant security, avoidance, and ambivalence are not categorical in nature (Fraley & Spieker, 2003). They were not able to uncover the structure of disorganization due to a limited

number of indicator variables. This analysis—although limited to infancy—raises the question as to whether attachment in the preschool years follows a similar continuous pattern.

Furthermore, categorical attachment assessments limit our knowledge to differences between classifications, thereby neglecting individual differences *within* classifications (Feeney, 2016). Within a given classification, there is considerable variation (e.g., some secure children may present only strong indicators of security whereas others may present a mix of security and avoidance), which could be meaningful in itself. As children's attachment can only be put into one classification, categorical assessment implies mutual exclusivity, even though a child's true attachment type may lie on the border between two classifications (as could be the case for a child showing a mix of security and avoidance; Cummings, 2003).

From a statistical standpoint, categorical assessments also limit power to detect differences. To reach the statistical power necessary to find reliable group differences between classifications (Solomon & George, 2016), it is necessary to gather larger sample sizes. Given the challenges associated with observational research, the number of cases in each insecure classification is often insufficient to warrant individual analysis. Some scholars thus rely on a secure-insecure attachment binary model to respect statistical postulates (e.g., Anan & Barnett, 1999; Bureau et al., 2017; Moss et al., 2005; Speltz et al., 1999), which limits our understanding of the different insecure groups. In contrast, others choose to compare insecure groups, but their results often rely on a small number of cases. These limitations hinder our understanding of insecure attachments and their comorbidity, which notably makes it impossible to determine whether controlling children present increased levels of behaviorally disorganized behaviors, although this phenomenon is observed by PACS coders (Moss & Bureau, 2015).

Continuous Scales of the PACS

Although the PACS is used primarily as a categorical assessment of attachment, the PACS coding manual (Cassidy et al., 1992) includes Main and Cassidy's (1987) continuous scales for security and avoidance in six-year-old children (measured on 1-9- and 1-7-point scales, respectively). Although there is no behavioral disorganization scale in the PACS manual, some studies (e.g., Chatoor et al., 1998; Seifer et al., 2004) use the 1-9-point scale infancy disorganization scale (Main & Solomon 1990) with a preschool sample. In spite of these scales' statistical advantages over classifications, they present two important limitations. First, they were not developed and adapted specifically for preschool attachment, as their descriptions refer to attachment behaviors associated with other developmental periods. Second, this lack of adaptation to preschool attachment results in the absence of scales for half of the preschool attachment types, as there are no scales for ambivalence, controlling-caregiving, and controlling-punitive attachment.

The absence of scales for these attachment types is especially problematic given their concurrent and longitudinal correlates with socioemotional adaptation (e.g., ambivalence and externalizing behaviors, Fearon et al., 2010; controlling-caregiving and internalizing behavior, Moss, Cyr, et al., 2004; controlling-punitive and disruptive behavior, O'Connor et al., 2011). Furthermore, it prevents the differentiation of the different preschool disorganization *subtypes* (behavioral disorganization, controlling-caregiving, and controlling-punitive), although previous research highlights their distinctness. Indeed, results from the NICHD sample (N = 1,364; O'Connor et al., 2011) showed that controlling-punitive children presented the highest levels of disruptive behaviors, while controlling-caregiving children displayed the lowest (even lower than secure children). Behaviorally disorganized children presented worse relationships with their teachers at 54 months than controlling-caregiving children. Among all groups, behaviorally

disorganized and controlling-punitive children had the most maladaptive profile across 18 variables (O'Connor et al., 2011). The need to differentiate disorganized subtypes was also confirmed in middle childhood, as behaviorally disorganized and controlling-punitive, but not controlling-caregiving attachment, were associated with externalizing behaviors (Bureau et al., 2009). Taken together, these results highlight the importance of having distinct scales to assess all types of preschool attachment. It should be noted that previous studies that examined disorganized subtypes separately are limited to child-mother dyads (Moss, Cyr, et al., 2004; O'Connor et al., 2011), as studies with child-father dyads and the PACS in the preschool years did not have a sufficient sample size to examine them independently (e.g., Bureau et al., 2014; George et al., 2010). This limitation leaves the question as to whether comparable differences across subtypes of disorganization are also present in child-father dyads.

Preschool Attachment Rating Scales

Recently, Moss and colleagues (2015) developed a coding manual for continuous scales adapted to preschool attachment, the PARS. These scales are based on the PACS. To our knowledge, it is the only measure of *behavioral* attachment with continuous scales that distinguish insecure patterns of preschool attachment. It is important to note that continuous measures exist for preschool attachment, such as Waters and Deane's (1985) Attachment Q-Sort (AQS) and the Attachment Story Completion Task (ASCT; Bretherton & Ridgeway, 1990). However, they do not provide the same attachment-related information as the PARS. The AQS offers a single scale of security-insecurity, thereby preventing the distinction between insecure attachment patterns. Although some coding systems for the ASCT include differentiated scales for some attachment types, the ASCT is used to evaluate attachment representations (which scholars believe is indicative of children's internal working models), and thus cannot provide

information as to children's actual attachment *behaviors* with their attachment figure. As such, the PARS address a need for continuous scales to measure all preschool attachment behaviors.

The PARS rating criteria are exhaustive and based on indicators specific to the preschool period, thereby preventing coders from interpreting criteria in different ways. Two certified PACS trainers developed the PARS in consultation with Robert Marvin, one of the original developers of the PACS. The scales are grounded in the theoretical and empirical traditions of preschool attachment. Trained and reliable coders use video-recordings of the separation-reunion procedure adapted for the preschool years (Cassidy et al., 1992) to rate the PARS. Based on children's behaviors, coders assign ratings on six scales: security, avoidance, ambivalence, behavioral disorganization, controlling-caregiving, and controlling-punitive. Ratings on a given scale are based on the extent to which a given attachment strategy (as described in the PACS; Cassidy et al., 1992) is globally displayed by the child, while keeping in mind the overall strategy. Scales have a uniform rating of 1 to 9, with every other point defined (i.e., 1, 3, 5, 7, and 9). A score of 5 on a scale generally warrants classification in this attachment pattern under the PACS; however, ratings are independent from (i.e., not based on) the assigned classification.

The PARS were carefully designed to adhere to guidelines for new continuous measures of attachment (Cassidy, 2003; Fraley & Spieker, 2003; DeKlyen & Greenberg, 2016). Indeed, they maintain a *focus on organization of behavior* because each scale represents the extent to which a child displays a specific organization of behavior (instead of representing individual behaviors or their mere frequency). The PARS also allow for the *representation of classic attachment types* and is *grounded in indicators and procedures already used*. Lastly, they allow for a more *detailed description of disorganized subtypes* (i.e., behaviorally disorganized,

controlling-caregiving, and controlling-punitive). This study aims to explore the reliability and validity of the newly developed PARS instrument to assess preschool child-parent attachment.

Validation Strategy

In addition to examining traditional aspects of validity (e.g., inter-rater reliability, convergent validity), this study follows Solomon and George's (2016) recommendations regarding the validation of new attachment measures. As such measures should be usable across attachment figures, and thus, the current study examines the reliability and validity of the PARS for both child-mother and child-father attachment. Research from two research groups (Bureau et al., 2014, 2017; George et al., 2010) supports the adequacy of the modified separation-reunion procedure to evaluate child-father attachment in the preschool years. These research efforts support our simultaneous investigation of child-mother and child-father attachment as assessed by the PARS because their studies report: (a) attachment distributions consistent with previous meta-analytical findings for both child-mother and child-father attachment (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999), and (b) significant associations between child-father attachment and paternal sensitivity as well as with socioemotional adaptation.

Solomon and George (2016) noted that new attachment measures should be associated with parental sensitivity, as this link is a core tenet of attachment theory (Ainsworth et al., 1978). Meta-analyses confirmed this association for maternal sensitivity and infant-mother security (r = .22; De Wolff & van IJzendoorn, 1997) and for paternal sensitivity and infant-father security (r = .12; Lucassen et al., 2011). It should be noted that sensitivity in infancy is typically construed as parents' response to their child's distress and non-distress, whereas in the preschool years, sensitivity is conceived as parents' supportive presence (Raikes & Thompson, 2008). Scholars (including NICHD) thus use semi-structured dyadic interactions during problem-solving,

construction, or free-play tasks to examine parental sensitivity during the preschool years (e.g., Kok et al., 2013; NICHD, 2001; Raby et al., 2015). Play tasks seem especially adapted to the preschool years, in addition to providing an assessment that is more adapted to both parents' interactive styles (see Grossmann & Grossmann, 2002). The Laughing Task procedure (Bureau et al., 2014), which was used in this study to assess the association of the PARS with parental sensitivity, uses a similar semi-structured interaction. It relies on a simple instruction to the parent: "do whatever you do at home to make your child laugh". Without any toys in the room, parents are to try activating and regulating their child's emotion with sensitivity, thereby providing a compelling context to observe these parental behaviors. This procedure shifts the assessment of sensitivity from comfort and nurturance, making it more adapted to both parents.

New attachment measures should also be associated with important aspects of development (Solomon & George, 2016), such as socioemotional adaptation. A recent meta-analysis found significant associations between externalizing behaviors and child-mother security, ambivalence, and behavioral disorganization in the preschool years (Fearon et al., 2010). However, these results are inconsistent with studies that include both child-mother and child-father attachment, which show that child-father attachment security is associated more strongly with socioemotional adaptation than child-mother attachment (e.g., Boldt et al., 2014; Kochanska & Kim, 2013; Verissimo et al., 2011; Verschueren & Marcoen, 1999).

Objectives and Hypotheses

Objective 1. Inter-Rater Reliability of the PARS

We hypothesized the scales to present good (intraclass correlations, ICC = .60 to .74) or excellent (ICC = .75 to 1.00; Cicchetti, 1994) reliability as coders followed extensive training and achieved reliability with expert coders on an independent set of cases.

Objective 2. Associations Between Individual Scales

Given the theoretical and practical evidence arising from previous studies with continuous scales (e.g., Brumariu et al., 2018; Fraley & Spieker, 2003; McCartney et al., 2004; Moss et al., 2015), we expected security scores for a parent to be associated with low scores on the five insecure scales for the same parent, and vice versa. We also expected to find negative associations between avoidance and resistance, and positive associations the behavioral disorganization scale and both the controlling-caregiving and controlling-punitive scales. As for the association between child-mother and child-father scales, we expected to find a moderate correlation between the security scales and similar mean scores on the scale (based on significant concordance in infancy: van IJzendoorn & De Wolff, 1997, and middle childhood: Boldt et al., 2016). We did not pose a hypothesis for insecure scales as there is limited research examining concordance between insecure groups.

Objective 3. Convergence of the PARS with the PACS

Although the PARS and the PACS were examined based on the same separation-reunion behaviors, it is necessary to determine whether assessment of the PARS is consistent with an independent assessment of the PACS (this analysis is conducted on a subset of the sample for which PARS and PACS were coded independently). We expected PACS classification in a given category to be associated with higher scores on the associated PARS scale.

Objective 4. Association of the PARS with Key Variables

We assessed the association between the individual attachment scales and two key variables: parental sensitivity (while controlling for the other parent's sensitivity level to compensate for the potential shared variance associated with the other parent's sensitivity) and

child externalizing behaviors. We also compared the PARS' predictive power by examining whether it accounted for comparable or supplemental variance when compared to the PACS.

We expected maternal sensitivity to be positively associated with the child-mother security scale (De Wolff & van IJzendoorn, 1997), and paternal sensitivity to be positively associated with the child-father security scale (Lucassen et al., 2011). We also expected to uncover associations with some insecure scales but refrained from specifying which ones, as previous research was mostly predicated on a secure-insecure dichotomy. As for externalizing behaviors, we expected to find associations between externalizing behaviors and security, ambivalence, and behavioral disorganization (Fearon et al., 2010) but refrained from specifying for which parent given inconsistencies in the literature. We expected these associations to be comparable to those of the PACS, or to explain supplemental variance beyond the PACS.

Method

Participants

The initial sample comprised 157 preschool-aged children and their parents. Of this number, we excluded 13 families for the purpose of this study: 12 families failed to complete experimental sessions with both parents, while a technical error irreversibly compromised video-recordings for another family. The final sample consisted of 144 children (M = 46.89 months, SD = 8.77; 83 girls) who completed a separation-reunion procedure with each parent. One hundred seven of these families were part of previous studies by Bureau and colleagues (2014, 2017), while the rest (n = 37) were added subsequently using the same protocol to increase the sample size. We recruited all participants from a low sociodemographic risk population in a large Eastern Canadian city through radio, newspapers, and online advertisements between 2009 and 2013. Children had to be between 3 and 5 years old and living with both parents to be eligible for

participation. Non-biological parents considered to be a parental figure were eligible to participate if they had been living with the child for a minimum of two years. The sample included two non-biological parents (an adoptive father and a step-father). No same-sex families chose to participate.

Families were English-speaking (79.2%) and French-speaking (20.8%), with a majority of mothers identifying themselves as Caucasian (84.7%). The rest identified as Asian (6.3%), Middle Eastern (4.2%), Black (3.5%), and First Nations (1.4%). Fathers also mostly identified as Caucasian (84.7%), whereas others identified as Asian (7.6%), Middle Eastern (4.2%), Black (2.1%), First Nations (0.7%), and Latino (0.7%). Most families were not at socioeconomic risk, with only 20.1% reporting a gross annual household income lower than $75,000. Furthermore, 71.1% of mothers and 63.9% of fathers reported completing a university degree. These characteristics were representative of the region's population (Statistics Canada, 2017).

Procedure

Children participated in a two-hour video-recorded laboratory session with each parent. Sessions were scheduled in a counterbalanced order, six months apart; all procedures were conducted independently for each parent. After receiving parental consent and child assent, child-parent dyads completed the Laughing Task procedure (Bureau et al., 2014), a semi-structured validated task to evaluate parental sensitivity. In this task, we asked parents to make their child laugh without using any toys. Dyads then completed a separation-reunion procedure (Cassidy et al., 1992) in a testing room containing age-appropriate toys and magazines. This procedure allowed for the observation of children's attachment behaviors through two sets of 5-minute separations and reunions with the parent. Afterwards, children completed activities with a research assistant while the parent answered questionnaires on their child's socioemotional

adaptation and sociodemographic information. Following their participation, parents received monetary compensation and children received a toy. The institution's Research Ethics Board approved all procedures and measures used in this study.

Instruments

Categorical Measure of Child-Parent Attachment. Trained and reliable coders classified children's attachment behavior during the separation-reunion procedure following the PACS (Cassidy et al., 1992) guidelines. The PACS is widely accepted as the method of choice to assess qualitative differences in child-parent attachment during the preschool years (Solomon & George, 2016). It presents adequate psychometric properties with child-mother dyads (Moss, Bureau, et al., 2004; NICHD, 2001; O'Connor et al., 2011) and child-father dyads (Bureau et al., 2014, 2017; George et al., 2010).

The training for the PACS is currently offered by certified trainers along with the PARS training. The training requires two weeks of training during which coders learn the characteristics of the different attachment styles and how to identify them. Trainees watch a number of taped cases and apply their new knowledge throughout the training. After the training, trainees must code 20 practice tapes for independent study. They then code another 20 exam tapes from a pre-established set of tapes to test for reliability. Coders receive their certification if they achieve at least 80% reliability (or 16/20) on the exam tapes.

Coders must choose one of six possible attachment classifications: secure, insecure-avoidant, insecure-ambivalent, behaviorally disorganized, controlling-caregiving, or controlling-punitive. The choice of classification is based on the entire separation-reunion procedure (pre-separation, separations, and reunions), because attachment coding is about organization of behaviors, and not merely spotting specific behaviors in children (Sroufe & Waters, 1977). That

said, a particular emphasis is put on the reunions, and even the first moments of reunion, when tension created by the procedure is at its peak. Coders thus base their judgement on a wealth of information when making their judgment for the attachment classification of a child, a judgement that is based on their extensive training with expert coders.

In the current study, five coders (who were blind to other study variables and to the other parent's rating) coded the tapes. In the current sample, sixty-eight percent of cases were double-coded (97 child-mother tapes and 99 child-father tapes). Coders reached 92% agreement for child-mother dyads (*kappa* = .83) and 90% agreement for child-father dyads (*kappa* = .83) for the 6-way classification. Reliability reached 95% (*kappa* = .88) and 92% (*kappa* = .83) agreement for secure-insecure classification with child-mother and child-father tapes, respectively. Coders reviewed any disagreement until they reached a consensus. Distribution of attachment classification was as follows: 97 child-mother dyads (67.4%) were secure, 2 (1.4%) avoidant, 13 (9.0%) ambivalent, 12 (8.3%) behaviorally disorganized, 18 (12.5%) controlling-caregiving, and 2 (1.4%) controlling-punitive. For child-father attachment, 89 dyads (61.8%) were secure, 9 (6.3%) avoidant, 14 (9.7%) ambivalent, 11 (7.6%) behaviorally disorganized, 20 (13.9%) controlling-caregiving, and 1 (0.7%) controlling-punitive.

Continuous Measure of Child-Parent Attachment. Children's behavior during the separation-reunion procedure was also assessed using the PARS (Moss et al., 2015) to obtain continuous ratings of attachment. Coders assign scores on six continuous 1–9 scales for each child: security scale, insecure-avoidance scale, insecure-ambivalence scale, behavioral disorganization scale, controlling-caregiving scale, and controlling-punitive scale. Ratings of 5 are considered the cut-off point for classification, but coders may assign a score of 5 or above to more than one scale; such ratings normally mandate a behaviorally disorganized primary

classification as behaviors represent a mix of attachment strategies (or lack thereof; Moss et al., 2015).

Coders assign a single score on each scale based on the entire separation-reunion procedure (i.e., global coding). Similar to the PACS coding, coders are particularly attentive to the reunions, but also rely on other segments of the procedure to make their judgement. Coders consider all of the modalities of children's behaviors (body orientation/proximity, speech, gaze, and affect). A child's score on a scale represents both the duration and frequency of their behaviors, as well as the developmental appropriateness of the behavior (as the system is intended for use with children between 2.5 and 7 years of age).

Three coders rated the PARS: one of the co-developers of the PARS and two trained coders who achieved excellent reliability (ICC > 0.75) with the certified trainer on a separate set of tapes. Coders were blind to other study variables and to the child's attachment with the other parent. They were also blind to attachment classifications (PACS) for 107 families. They participated in PACS classification for the remaining 37 families; for this reason, convergent validity analyses only used the 107 families for which classification (PACS) and scales (PARS) were rated by independent coders.

Parental Sensitivity. Four coders assessed parental sensitivity with a modified version of the *Parent-Child Interaction Scale for the Preschool and School Periods* (Moss et al., 1996). This coding system has previously been used across a wide range of tasks (e.g., picture-book reading: George & Solomon, 2016; semi-structured dyadic activities: Hobson et al., 2016; snack-time interaction: Milot et al., 2010). The modified version of the system used for the current study was adapted and validated for use with the Laughing Task procedure by Bureau and colleagues (2014). It yields two main factors (Dyadic Synchrony and Task Management) and 10

subscales (including parental sensitivity) assessing different aspects of child-parent interactions. Bureau and his colleagues (2014, 2017) found that both parents provided similar efforts during the task, but that mothers achieved a greater synchrony with their child. They also found that parental sensitivity was associated with child-mother and child-father attachment.

For the purpose of this study, we only used the parental sensitivity subscale. Scores on this subscale range between 1 (absence of parental sensitivity) to 4 (greater parental sensitivity). Coders were blind to other study variables and to the other parent's ratings. Pearson intraclass correlations reached .77 (single measures) based on 20% (29 cases) double-coded tapes for maternal sensitivity, and .71 based on 21% (30 cases) double-coded tapes for paternal sensitivity. Coders reviewed all disagreements until they reached consensus.

Externalizing Problems. Mothers and fathers completed the *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997) to report on their child's externalizing behaviors. The SDQ presents good psychometric properties and strong correlations with the Child Behavior Checklist (Achenbach, 1991; Goodman & Scott, 1999). The SDQ comprises 25 items pertaining to children's positive and negative behaviors, rated as "Not true", "Somewhat true", and "Certainly true". For the purpose of this study, we used a broader externalizing scale comprising conduct problems and hyperactivity/inattention items instead of using the subscales individually. This is in line with previous work suggesting that the broader externalizing scale is more appropriate for low-risk samples (Goodman et al., 2010). We used averaged scores of mother- and father-reported externalizing behaviors, as previous research suggests that averaged parental report can avoid the over- or underestimation of children's behavioral problems that is associated with single informants (Alakortes et al., 2017). The internal consistency of the externalizing behaviors scale was adequate (α = .80).

Results

Preliminary Analyses

Prior to the main analyses, we explored the potential effects of sociodemographic variables (child age, child gender, family income, and visit order) on study variables. For the PARS in child-mother dyads, analyses revealed the following significant associations: ambivalence and child age (r = -.18, p < .05); controlling-caregiving and child age (r = .17, p < .05); controlling-caregiving and child gender (t[142] = -2.15, p < .05, boys: M = 2.36, SD = 1.63; girls: M = 3.00, SD = 1.86) and; controlling-punitive and family income (r = -.22, p < .01). Significant covariates of the PARS in child-father dyads included: ambivalence and child-age (r = -.20, p < .05); behavioral disorganization and child gender (t[142] = 2.63, p < .01, boys: M = 2.22, SD = 2.09; girls: M = 1.46, SD = 1.03) and; controlling-caregiving and child gender (t[142] = -2.28, p < .05, boys: M = 2.18, SD = 1.47; girls: M = 2.83, SD = 1.93). The following covariates were also significant for other study variables: the PACS in child-father dyads and child gender (χ^2(5, N = 144) = 17.36, p < .01, post hoc analyses show that boys were more likely to be classified as behaviorally disorganized and less likely to be controlling-caregiving, whereas the reverse was true for girls. We thus performed analyses while controlling for child gender, child age, and family income.

Inter-Rater Reliability of the PARS

Table 2.1 presents descriptive statistics and reliability scores for each individual child-mother and child-father attachment scale. The continuous nature of the scales guided our decision to assess reliability using two-way mixed, absolute agreement, single-measure ICCs (Hallgren, 2012). Analyses are based on 20% of double-coded tapes for child-mother (n = 29) and child-father (n = 29) attachment. All child-mother scales presented excellent reliability

(ICCs ranging from .88 to .96; Cicchetti, 1994). Child-father scales also presented excellent reliability (ICCs between .75 and .92), except for the controlling-punitive scale which presented good reliability (ICC = .60; Cicchetti, 1994).

Associations Between Individual PARS

In order to determine if scales correlated with one another in the expected direction, we computed partial correlations between each scale while controlling for child gender, child age, and family income (see Table 2.2; zero-order correlations are also presented). Child-mother security scale was significantly negatively correlated with all child-mother insecurity scales (*r*s ranging between -.23 and -.60). Correlation difference tests based on Steiger's *z*-test (using zero-order correlations) revealed differences in the magnitude of correlations between the security scale and the insecure ones: the correlations between security and behavioral disorganization as well as security and ambivalence were significantly stronger than the correlation between security and avoidance ($z = -4.07$, $p < .001$ and $z = -2.84$, $p < .01$, respectively). The correlation between security and behavioral disorganization was also stronger than that between the security and controlling-punitive scales ($z = 3.68$, $p < .01$). Intercorrelations between insecure scales revealed that behavioral disorganization was positively correlated with all other insecure scales (*r*s ranging between .17 and .29); Stieger's *z*-test found no significant difference in the magnitude of these correlations. As for the other scales, ambivalence was associated negatively with avoidance and positively with the controlling-punitive scale.

Results for child-father scales (Table 2.2) revealed significant negative correlations between security and all insecure scales (*r*s ranging between -.37 and -.46). Stieger's *z*-test showed that these correlations were of comparable magnitudes. For insecure scales, ambivalence was associated negatively with avoidance and positively with the controlling-punitive scale.

In order to examine the association between child-mother and child-father scales, we performed correlations for attachment scale pairs (e.g., $Secure_{mother}$ and $Secure_{father}$; $Avoidant_{mother}$ and $Avoidant_{father}$). As shown in Table 2.3, all pairs, except for the controlling-punitive scale, were significantly correlated (*r*s ranging from .21 to .42). Paired difference t-tests between attachment scale pairs enabled us to examine whether the mean score of the child-mother scale was comparable to that of the child-father scale. Scores on all scales were comparable (i.e., means of child-mother scales are not different from the means of child-father scales), except for avoidance, for which the child-father mean was higher than child-mother.

Convergence of the PARS with the PACS

For the current analysis, we used cases for which attachment scales and attachment classifications were coded by two different and independent coders ($n = 107$; i.e., a first coder coded classification only and a second independent coder rated scales only). For child-mother attachment, we ran a multivariate general model analysis with 6-way attachment classification and the six attachment scales (Table 2.4). The pattern of attachment scale scores varied across classifications, $F(30) = 26.92$, $p < .001$, and scores varied across categories. LSD post-hoc tests revealed that, for all scales, scores were highest among children classified in the associated classification (e.g., secure children presented significantly higher scores on the security scale than children in all other classifications). Post-hoc comparisons revealed other significant differences. Ambivalent children presented higher security scores than their behaviorally disorganized counterparts. Behaviorally disorganized, controlling-caregiving, and controlling-punitive children all had higher ambivalence scores than secure and avoidant children. Children classified as controlling-caregiving and controlling-punitive presented higher behavioral disorganization scores than their secure and insecure-organized peers. Behaviorally disorganized

children scored higher on the controlling-caregiving scale than secure and ambivalent children. Lastly, controlling-caregiving children displayed higher scores on the controlling-punitive scale than secure, insecure-organized, and behaviorally disorganized children.

A second multivariate general model analysis with child-father 5-way attachment classification (only one child was classified as controlling-punitive, forcing us to exclude the classification from this analysis) and the six attachment scales (n = 107) revealed results similar to those of the child-mother model: a significant multivariate effect, $F(26) = 28.73$, $p < .001$, significant univariate effects for each scale, and significant post-hoc comparisons showing that scores were highest among children classified in the associated category (Table 2.4). Other post-hoc comparisons revealed that behaviorally disorganized and controlling-caregiving children presented higher levels of avoidance than their secure and ambivalent counterparts. Children classified as behaviorally disorganized had higher ambivalence scores than their secure and avoidant peers. Controlling-caregiving children had higher behavioral disorganization scores than secure and insecure-organized children. Children classified as ambivalent presented higher scores on the behavioral disorganization and controlling-punitive scales than their secure counterparts.

Association of the PARS with Key Variables

Correlational analyses between attachment scales and parental sensitivity showed that, as expected, higher parental sensitivity is associated with higher scores on the security scale for both child-mother and child-father attachment (see Table 2.2). These results remained significant (and of comparable magnitude) after controlling for the other parent's sensitivity levels, suggesting a direct association between paternal sensitivity and the quality of the child-father attachment relationship that goes beyond the bounds of maternal sensitivity, and vice versa.

In order to determine if the associations between the security scales and parental sensitivity accounted for comparable or supplemental variance when compared to the PACS classification, we used Haynes and Lench's (2003) incremental validity assessment techniques. For each parent, it involved computing two hierarchical regression models. In Model 1, a PACS dummy variable (e.g., secure vs. non-secure) was entered first, and the associated PARS scale second (e.g., security scale). In Model 2, a PARS scale (e.g., security scale) was entered first, and the associated PACS dummy variable second (e.g., secure vs. non-secure).

If both models show a significant step 1 but not step 2, it would show that the scale and classification hold similar predictive power (that do not account for variance beyond one another). In contrast, if one model features a significant step 2 while the other does not, it would indicate that the significant one holds supplemental predictive power over the nonsignificant one. This latter case applied to child-mother security, as the scale was associated with maternal sensitivity beyond the PACS in the first model ($\Delta F = 6.60$, $p < .01$, $\beta = .45$), whereas the classification did not contribute beyond the PARS in the second model ($\Delta F = 1.86$, $p > .05$, $\beta = .24$). The same pattern applied to child-father security: the scale was associated with paternal sensitivity beyond the classification ($\Delta F = 4.58$, $p < .05$, $\beta = .39$), whereas the classification did not contribute beyond the scale in the second model ($\Delta F = 0.06$, $p > .05$, $\beta = .05$). These results show that the PARS security scale provides supplemental predictive variance compared to the PACS security classification in the relationship with parental sensitivity.

For child-mother insecure scales, analyses revealed that maternal sensitivity was negatively associated with child-mother ambivalence and behavioral disorganization. Using Haynes and Lench's (2003) incremental validity assessment technique, we found that the ambivalence scale was associated with maternal sensitivity beyond the classification ($\Delta F = 8.05$,

$p < .01$, $\beta = -.31$), whereas the classification did not contribute beyond the scale in the second model ($\Delta F = 2.66$, $p > .05$, $\beta = -.18$). This suggests that the PARS ambivalence scale provides additional predictive power when compared to the PACS ambivalence classification. For behavioral disorganization, although both the scale and classification were significantly associated with maternal sensitivity when entered in the first step, they failed to explain additional variance when entered in the second step (scale: $\Delta F = 1.49$, $p > .05$, $\beta = -.19$ and classification: $\Delta F = 0.03$, $p > .05$, $\beta = .02$). This indicates that the PARS behavioral disorganization scale holds comparable predictive power to the PACS behavioral disorganization classification.

For child-father insecure scales, paternal sensitivity was negatively associated with the child-father controlling-caregiving and controlling-punitive scales. Incremental validity analyses revealed that although both the controlling-caregiving scale and classification were significantly associated with paternal sensitivity when entered in the first step, they failed to explain additional variance when entered in the second step (scale: $\Delta F = 0.25$, $p > .05$, $\beta = -.06$ and classification: $\Delta F = 3.14$, $p > .05$, $\beta = .22$). For the controlling-punitive scale, the first model showed the scale was associated with paternal sensitivity beyond the classification ($\Delta F = 6.43$, $p < .01$, $\beta = -.23$), whereas the classification did not contribute beyond the scale in the second model ($\Delta F = 0.19$, $p > .05$, $\beta = .04$). These results suggest that the PARS controlling-caregiving scale holds comparable predictive power and that the controlling-punitive scale provides supplemental predictive power when compared to the PACS.

We also examined the correlations between child-mother and child-father attachment scales and child externalizing behaviors to assess the PARS' predictive validity. Results revealed no significant associations between child-mother scales and externalizing behaviors (Table 2.2).

For child-father scales, child externalizing behaviors were negatively associated with security and positively associated with ambivalence. Incremental validity analyses revealed that the security and ambivalence scales hold comparable predictive power to that of the PACS classification, as they were significantly associated with externalizing behaviors when entered in the first step, but they failed to explain additional variance when entered in the second step (security scale: $\Delta F = 2.65$, $p > .05$, $\beta = -.30$ and security classification: $\Delta F = 0.03$, $p > .05$, $\beta = .03$; ambivalence scale: $\Delta F = 2.39$, $p > .05$, $\beta = .17$ and ambivalence classification: $\Delta F = 0.43$, $p > .05$, $\beta = .07$).

Discussion

Given the absence of a continuous system conceived and validated specifically for preschool attachment, this study aimed to provide evidence for the validity of the PARS (Moss et al., 2015). This study was the first to examine the reliability and validity of the PARS. Results show that the PARS is a reliable and valid instrument that is well-suited to a fine-grained analysis of preschool children's attachment to their mother and father. Reliability analyses showed that the PARS is a reliable instrument, as child-mother and child-father scales all presented good or excellent reliability. It is apparent that the ICC of the child-father controlling-punitive scale is lower than other scales, despite being within the "good reliability" range (Cicchetti, 1994). This could be explained by the relative rarity of these behaviors in a normative sample such as ours, as low frequency reduces reliability (Haynes et al., 2011). To address such issues of low disorganized scores, future research may use a composite score of the behavioral disorganization and controlling-punitive scales. This approach was used by Bureau and his colleagues (2009) in middle childhood, as behavioral disorganization and controlling-punitive behaviors were moderately correlated and loaded on a same factor. In contrast, the controlling-

caregiving scale was not associated with behavioral disorganization (and was negatively associated with the controlling-punitive scale) and loaded on its own factor. It is, however, worth noting that Bureau and colleagues' (2009) study only included child-mother dyads; future research will be necessary to determine if such grouping is warranted for child-father dyads.

The lower ICC of the controlling-punitive scale may also indicate that the conception of controlling-punitive attachment itself, which is based on child-mother samples, does not apply fully to child-father dyads. It is conceivable that a father's dominating presence in some non-optimal familial contexts discourages the child from exhibiting strong forms of punitive behaviors toward their father. They could instead be expressed in a subtler manner. As the current study is the first to examine both controlling-punitive and controlling-caregiving attachments in child-father dyads in the preschool years (be it with categorical or continuous measures), the concept of child-father role-reversal as a whole warrants further investigation, notably in a clinical sample.

Results also show that the PARS possess good validity. The intercorrelations between scales were consistent with previous theoretical and empirical work, notably with studies of middle childhood (Brumariu et al., 2018). Brumariu and colleagues (2018) used six attachment scales (one for each attachment type) to evaluate child-mother attachment during a conflict task in which child-mother dyads discussed a topic of conflict. Consistent with this study, we found that the security scale was negatively associated with all insecure scales for both child-mother and child-father attachment. For child-mother attachment, the strongest correlation was with the behavioral disorganization scale, as was the case in Brumariu and colleagues' (2018) study. The size of the association between security and behavioral disorganization was also similar to what was found in the 36-month NICHD sample (r = -.60 for child-mother and r = -.45 for child-

father scales in our sample, r = -.55 in the NICHD sample; McCartney et al., 2004). Pursuing the comparison with Brumariu and colleagues' (2018) study, we both found a negative association between avoidance and ambivalence, and a positive association between ambivalence and the controlling-punitive scale for both parents. For child-mother attachment, we also replicated the association between behavioral disorganization and the controlling-punitive scale. Although minor differences were present across our studies, our results attest to the similarity between preschool and middle childhood attachment, and thus the pertinence of such comparisons in future research.

Significant associations between child-mother and child-father security scales are in line with previous research showing concordance between security/insecurity to mother in infancy (r = .17; van IJzendoorn & De Wolff, 1997). This association was, however, larger in our preschool sample (r = .42; Stieger's z-test: z = 3.06, p < .01). This difference may be explained by a self-forming bias of family composition—by the preschool years, many parents may already be separated. One can expect that separated families are more likely to present discordant attachments, which could contribute to a negative and conflictual familial environment. In contrast, concordant attachments may reduce strains associated with child rearing within the couple relationship, thereby contributing indirectly to parents remaining a couple through the preschool years. As a result, preschool samples of intact families may feature higher concordance than infant ones. This interpretation is supported by studies of intact families in middle childhood such as those by Boldt and colleagues (2016), who found a correlation of r = .55 between security to mother and father at age 10 (which is in line with our results; Stieger's z-test: z = -1.31, p > .05).

Comparisons between child-mother and child-father scales also indicate that the PARS can be used across multiple caregivers. Indeed, children did not present higher scores on child-mother than on child-father scales (nor the reverse). One notable exception was the avoidance scale, which displayed higher scores under the child-father scales than the child-mother scales. Although this result may suggest higher avoidance with father, replication is necessary to determine if this is a simple artifact of our sample which presented low levels of avoidance to mother. It should be noted that studies of preschool attachment tend to have lower avoidance rates (e.g., 4.8% in NICHD, 2001, 3.8% in the control sample of Speltz et al., 1999) than what is typically reported in infancy (i.e., 15%; see van IJzendoorn et al., 1999). This may indicate a need to refine the understanding of avoidance in the preschool years to fully grasp subtle behavioral manifestations of avoidance.

The current study also showed that the PARS present convergent validity with independently coded categorical attachment. Levels of each scale were the highest for children who were classified in the contiguous PACS classification for child-mother and child-father attachment. Although categorical and continuous scores are based on the same separation-reunion procedure, the correspondence between the two shows that the PARS derive similar information from this procedure as the PACS. Moreover, the PARS go beyond information provided by the PACS, as exemplified in the post-hoc comparisons. For example, findings illustrate that children classified as controlling-caregiving presented higher levels of behavioral disorganization than their secure, avoidant, and ambivalent peers. This result shows that despite controlling-caregiving children being perceived as nice and helpful by the parent (see Moss et al., 2011 for a review), a profound disorganization at the level of the dyad itself remains.

The associations between the PARS scales and key variables support the PARS' validity. As the influence of parental sensitivity on child-caregiver attachment is central to attachment theory (Ainsworth et al., 1978), the validity of the PARS was contingent upon uncovering this relationship (Solomon & George, 2016). Results revealed a small to moderate association between the security scale and parental sensitivity for both parents. In child-mother dyads, the association between attachment and maternal sensitivity (r = .23) was consistent with meta-analytical results in infancy (r = .22 in De Wolff & van IJzendoorn, 1997: Stieger's z-test: z = 0.12, p > .05) as well as middle childhood and adolescence (r = .31 in Koehn & Kerns, 2018: Stieger's z-test: z = -1.02, p > .05). The association between paternal sensitivity and attachment (r = .34) was stronger than meta-analytical findings of this relationship in infancy (r = .12 in Lucassen et al., 2011: Stieger's z-test: z = 2.64, p < .01), but not in middle childhood and adolescence (r = .19 in Koehn & Kerns, 2018: Stieger's z-test: z = 1.87, p > .05). This may suggest that the association between parental sensitivity and attachment becomes more important after infancy.

The different conceptualizations of parental sensitivity between these periods may also explain the stronger associations in the preschool years and beyond. Indeed, assessment of parental sensitivity during infancy focuses on parental response to distress and non-distress, whereas it centers on the parent's supportive presence in the preschool years (Raikes & Thompson, 2008). According to Grossman and colleagues (2002), fathers are prone to providing a supportive presence during child exploration, and less prone to providing comfort under a traditional definition. It is thus possible that the association between paternal sensitivity and attachment is larger in our sample due to the developmental period studied or to the task itself (which both present an important focus on exploration)—despite this difference, both Lucassen

and colleagues' (2011) meta-analysis and our results show a link between paternal sensitivity and child-father attachment, supporting the use of a separation-reunion paradigm to assess child-father attachment. Furthermore, this relationship held even when controlling for maternal sensitivity (see Bretherton, 2010).

We also found associations between parental sensitivity and insecure scales. Consistent with previous studies in infancy and middle childhood, our study revealed a small association (r = -.21) between child-mother behavioral disorganization and maternal sensitivity (r = -.18 in Koehns & Kerns, 2018: Stieger's z = 0.03, p > .05; r = -.10 van IJzendoorn et al., 1999 – Stieger's z = 1.29, p > .05). Child-mother controlling-caregiving and controlling-punitive attachment, despite their association to behavioral disorganization in this study, were not associated with maternal sensitivity. In contrast, child-father controlling-caregiving and controlling-punitive attachment, but not behavioral disorganization, were associated with paternal sensitivity. These associations for insecure attachments may differ across risk contexts. Only replication across varied familial contexts will allow drawing robust conclusions regarding the differences between insecure attachment to mother and father. It is also interesting to note that unlike Koehns and Kerns' (2018) meta-analysis, we did not find an association between avoidance and parental sensitivity. This difference supports the aforementioned suggestion that researchers may not yet understand the full subtleties of avoidance in the preschool years.

The current study identified that externalizing behaviors were associated significantly with child-father security, ambivalence, and behavioral disorganization. These results mirror the associations uncovered for child-father attachment in middle childhood by Boldt and colleagues (2016). However, they also found associations with child-mother security and behavioral disorganization, whereas we only found a marginal association for security. This result is

inconsistent with meta-analytical findings (Fearon et al., 2010). It is possible that more complex interactions between child-mother and child-father attachment are at play; such interactions are documented in prior studies (e.g., Kochanska & Kim, 2013; Verschueren & Marcoen, 1999) and warrant further investigation to better understand their underlying mechanisms.

We were also able to determine that the PARS' predictive power is comparable or higher than that of the PACS. This finding supports the use of the PARS (by itself or alongside with the PACS) when suitable to address the research questions scholars want to investigate (e.g., when examining specific subtypes of disorganization). Through the use of PACS classification and individual PARS scales, researchers will have access to valid, categorical and continuous measures of preschool attachment.

Limitations

This study was unable to evaluate test-retest reliability as it would have required children to complete four repeated assessments of the strange situation (two with each parent). This may be problematic as repeated attachment assessments can make the setting more familiar, or simply make the child more distressed (Ainsworth et al., 1978). The current study also examined convergent validity based on the same observations. Although informative, future work using the PARS should examine its concordance with other measures of attachment such as the ASCT or AQS. Furthermore, the study used a normative sample, which limits generalization to at-risk families. Future studies should examine if the same patterns hold, especially for the disorganized scales, in clinical or at-risk samples, which generally present higher rates of these attachment patterns. The study also relied on a mostly Caucasian sample, which warrants further validation in a more diverse sample.

Conclusion

This study provides evidence of the PARS' reliability and validity for both child-mother and child-father attachment. The current study is also the first to report results specific to role-reversal in child-father dyads during the preschool years, and to explore the association between parental sensitivity and attachment while controlling for the other parent's sensitivity levels. The level of precision of results found with the PARS attests to the usefulness of a continuous measure of preschool attachment that includes individual scales for all preschool attachment types.

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Tables

Table 2.1

Descriptive Statistics and Intraclass Correlations for Attachment Scales

	Child-mother attachment						Child-father attachment					
Scale[1]	ICC[2]	*M*(*SD*)	Range of scores	Distribution of scores[3]			ICC[2]	*M*(*SD*)	Range of scores	Distribution of scores[3]		
				1–3	3–5	5–9				1–3	3–5	5–9
B	.96 (.91-.98)	5.43 (1.86)	1–8.5	10.4%	22.2%	67.4%	.81 (.64-.91)	5.24 (1.90)	1–9	16.7%	21.5%	61.8%
A	.92 (.83-.96)	1.99 (1.20)	1–6	78.5%	18.1%	3.5%	.90 (.80-.95)	2.49 (1.44)	1–7	61.8%	29.2%	9.0%
C	.93 (.86-.97)	2.74 (1.68)	1–8	59.0%	27.8%	13.2%	.83 (.67-.92)	2.77 (1.75)	1–7.5	50.7%	35.4%	13.9%
D	.92 (.84-.96)	1.90 (1.74)	1–8	81.9%	7.6%	10.4%	.92 (.84-.96)	1.78 (1.61)	1–7	82.6%	9.7%	7.6%
CC	.94 (.87-.97)	2.73 (1.79)	1–8	56.3%	30.6%	13.2%	.75 (.53-.87)	2.55 (1.78)	1–8	63.9%	21.5%	14.6%
CP	.88 (.76-.94)	1.30 (.88)	1–8	93.1%	5.6%	1.4%	.60 (.30-.79)	1.28 (.77)	1–5.5	92.4%	6.3%	1.4%

Note. $N = 144$. *M* = mean, *SD* = standard deviation, ICC = intraclass correlations. [1]B = security, A = avoidance, C = ambivalence, D = behavioral disorganization, CC = controlling-caregiving, CP = controlling-punitive. [2]Two-way, absolute agreement, single-measure intraclass correlations based on double-coding 20% of cases. [3]Participants' distribution on the scale (i.e., proportion of participants who scored between 1 and 3, 3 and 5, and 5 and 9 on the 1–9 rating scale).

Table 2.2

Zero-Order Correlations Between Study Variables (Partial Correlations Controlling for Child Age, Child Gender, and Family Income)

	Attachment scales						Parental sensitivity		Socioemotional adaptation
	B	A	C	D	CC	CP	Not controlling for other parent's sensitivity	Controlling for other parent's sensitivity	Externalizing behaviors[a]
Child-mother attachment									
B	-						.24** (.23**)	.21* (.21*)	-.14^{t} (-.14^{t})
A	-.22** (-.23**)	-					-.01 (-.01)	-.01 (-.01)	-.08 (-.11)
C	-.51*** (-.50***)	-.19* (-.19*)	-				-.19* (-.18*)	-.17* (-.16^{t})	.14^{t} (.14)
D	-.60*** (-.60***)	.16* (.17*)	.19* (.18*)	-			-.21* (-.21*)	-.20* (-.20*)	.06 (.02)
CC	-.50*** (-.52***)	.00 (.02)	-.09 (-.08)	.27** (.29**)	-		-.08 (-.10)	-.07 (-.09)	.11 (.15^{t})
CP	-.34*** (-.33***)	-.03 (-.02)	.20* (.14^{t})	.20* (.18*)	.10 (.08)	-	-.06 (-.07)	-.06 (-.07)	-.02 (-.01)
Child-father attachment									
B	-						.35*** (.34***)	.35*** (.33***)	-.33*** (-.30***)
A	-.36*** (-.37***)	-					-.08 (-.10)	-.10 (-.12)	-.10 (-.11)
C	-.47*** (-.46***)	-.21* (-.21*)	-				-.12 (-.09)	-.11 (-.08)	.22** (.17*)
D	-.45*** (-.43***)	.08 (.07)	.15^{t} (.10)	-			-.09 (-.07)	-.08 (-.07)	.21** (.13)

CC	-.41*** (-.42***)	-.08 (-.08)	-.11 (-.10)	.09 (.14[t])	-	-.23** (-.22**)	-.22** (-.21*)	.11 (.17[t])
CP	-.45*** (-.44***)	.03 (.03)	.26** (.26**)	.12 (.12)	.16[t] (.15[t])	-.25** (-.24**)	-.25** (-.24**)	.15[t] (.12)

Note. $N = 144$. [a] Mother- and father-report scores were averaged for each scale. B = security, A = avoidance, C = ambivalence, D = behavioral disorganization, CC = controlling-caregiving, CP = controlling-punitive.

[t] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2.3

Correlations and Differences Between Associated Child-Mother and Child-Father Scales

Attachment scale pair	Zero-order correlation (Partial correlation[a])	Paired difference test between attachment scale pair	
		df	*t*
$B_{mother} - B_{father}$	.42*** (.42***)	143	1.15
$A_{mother} - A_{father}$	.26** (.26**)	143	-3.70*** (C-F > C-M)
$C_{mother} - C_{father}$	.38*** (.37***)	143	-0.24
$D_{mother} - D_{father}$	.21** (.21*)	143	0.69
$CC_{mother} - CC_{father}$	.33*** (.31***)	143	1.03
$CP_{mother} - CP_{father}$	-.04 (-.05)	143	0.86

Note. [a] Controlling for child age, child gender, and family income. $N = 144$. B = security, A = avoidance, C = ambivalence, D = behavioral disorganization, CC = controlling-caregiving, CP = controlling-punitive, C-F = child-father scale, C-M = child-mother scale.

** $p < .01$, *** $p < .001$

Table 2.4

Convergence Between 6-way Attachment Scales (PARS) and Attachment Classifications (PARS)

Attachment scale (PARS)	Attachment classification (PACS)						Univariate *F*-test (η_p^2)	Significant post-hoc differences between classifications
	Secure	Avoidant	Ambivalent	Behaviorally disorganized	Controlling-caregiving	Controlling-punitive		
Model 1: Child-mother attachment								
B	6.75	3.25	3.37	2.34	2.81	2.03	73.54*** (.80)	B > A, C, D, CC, CP C > D
A	2.03	6.04	2.04	2.77	2.33	1.60	5.32*** (.22)	A > B, C, D, CC, CP
C	2.10	1.48	6.19	3.66	3.58	3.97	27.85*** (.60)	C > B, A, D, CC, CP D, CC, CP > B, A
D	1.18	1.43	1.41	6.92	3.51	4.26	83.78*** (.82)	D > B, A, C, CC, CP CC, CP > B, A, C
CC	1.99	2.67	2.25	3.49	6.31	3.06	8.70*** (.32)	CC > B, A, C, D, CP D > B, C
CP	1.13	1.06	1.27	1.44	2.22	6.46	40.25*** (.68)	CP > B, A, C, D, CC CC > B, A, C, D
Model 2: Child-father attachment								
B	6.74	3.33	3.02	2.44	2.80		90.21*** (.79)	B > A, C, D, CC
A	2.06	6.24	2.24	2.37	3.39		30.14*** (.56)	A > B, C, D, CC D, CC > B, C
C	1.95	1.89	6.58	2.93	3.11		31.84*** (.58)	C > B, A, D, CC D > B, A
D	1.30	1.35	1.47	6.53	2.09		69.40*** (.75)	D > B, A, C, CC CC > B, A, C C > B
CC	1.87	1.55	1.76	3.62	5.58		9.64*** (.29)	CC > B, A, C, D

CP	1.00	1.04	1.58	1.39	2.92	4.12** (.15)	CC > B, A C > B

Note. $N = 107$. B = security, A = avoidance, C = ambivalence, D = behavioral disorganization, CC = controlling-caregiving, CP = controlling-punitive. Controlling for child age, child gender, and family income. Multivariate effect: Model 1: $F(30) = 26.92$, $p < .001$, $\eta_p^2 = .61$. Model 2: $F(26) = 28.73$, $p < .001$, $\eta_p^2 = .59$.
** $p < .01$, *** $p < .001$

CHAPTER 3 (Study 2)

Do Child-Father and Child-Mother Preschool Attachment Predict Boys' and Girls' Externalizing Behaviors in Middle Childhood?

Author's Note

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Abstract

Considerable research has examined the role of child-mother attachment in the development of children's externalizing behaviors. Only limited work has examined whether child-father attachment may also predict externalizing behaviors. Even less work has considered child-mother and child-father attachment as coexisting relationships that may simultaneously influence children as a joint effect. Existing work also neglects the impact of children's gender within the context of child-father relationships. The current study addresses these limitations by investigating how child-father attachment, child-mother attachment, and their interaction in the preschool years predict boys' and girls' externalizing behaviors in middle childhood. The sample included 144 preschool-aged children (M = 46.89 months, SD = 8.77, 83 girls) and both of their parents. Children completed independent separation-reunion procedures with each parent, which were coded using the *Preschool Attachment Rating Scales.* When children reached middle childhood, parents completed the *Strengths and Difficulties Questionnaire* to report on their children's externalizing behaviors. Results showed that child-father security predicted fewer externalizing behaviors in boys. Child-father ambivalence predicted more externalizing behaviors in boys, but only when child-mother ambivalence was at medium or high levels. Child-father behavioral disorganization predicted more externalizing behaviors in boys, while it predicted fewer externalizing behaviors in girls when in conjunction with high child-mother behavioral disorganization. Lastly, child-mother and child-father punitive attachment predicted more externalizing behaviors, their joint effect was significant at high levels of punitive attachment. These results provide insight into the ways that different types of insecure child-father and child-mother attachment may predict later socioemotional adaptation.

Keywords: preschool period, middle childhood, child-father attachment, child-mother attachment, externalizing behaviors

Do Child-Father and Child-Mother Preschool Attachment Predict Boys' and Girls' Externalizing Behaviors in Middle Childhood?

Considerable research has sought to identify precursors of children's externalizing behaviors. Among such precursors is a child's attachment relationship to their caregiver. A meta-analysis has shown that child-mother attachment insecurity predicts more externalizing behaviors in boys, but not in girls (Fearon et al., 2010). However, limited research has examined whether child-father attachment insecurity poses similar risks for the development of externalizing behaviors. The work conducted in this area is often limited to infant attachment, despite the fact that fathers become more involved in their children's lives during the preschool years (Lamb, 2004). In addition, it is unclear whether a gender effect similar as that reported in the child-mother attachment meta-analysis is present for child-father attachment. Lastly, very little work has used a family systems approach to examine the link between child-father attachment and externalizing behaviors. Such approach suggests that child-mother and child-father attachment may jointly predict externalizing behaviors (Cowan & Cowan, 2019; Dagan & Sagi-Schwartz, 2018). Recent evidence supports this idea, notably by showing that children with two insecure attachments present more behavior problems, while children with two secure attachments present fewer behavior problems (e.g., Boldt et al., 2014; Kochanska & Kim, 2013). Most of this work remains limited to cross-sectional designs and limited to a combined 'insecure group' that neglects the difference between various attachment patterns. This study seeks to address the aforementioned limitations by examining whether different child-father and child-mother attachment patterns in the preschool years independently and jointly predict boys' and girls' externalizing behaviors in middle childhood. This study uses a valid, continuous measure of attachment, the *Preschool Attachment Rating Scales* (PARS; Deneault et al., 2020), to secure

sufficient statistical power to delve into comparisons of different insecure patterns (i.e., avoidance, ambivalence, behavioral disorganization, controlling-caregiving, and controlling-punitive patterns) across boys and girls.

Child-Caregiver Attachment and Socioemotional Adaptation

Considerable research effort has been dedicated to the study of child-caregiver attachment and subsequent socioemotional adaptation. This is notably because the association between child-caregiver attachment and later socioemotional functioning is a core tenet of Bowlby's attachment theory (Bowlby, 1969/1982). Bowlby posited that children form mental representations (internal working models; IWM) through their repeated interactions with their caregiver. Children's IWM contain information about the likely availability of the caregiver to respond to their needs, as well as information about the worth of the self in relation to the caregiver's availability. These IWMs are believed to be one potential way that attachment relationships may influence children's adaptation (Bretherton et al., 1990).

Under attachment theory, sensitive caregiving and attachment security constitute protective factors against psychopathology and consequently put children on a more optimal trajectory of socioemotional development. The trust that secure children place in their caregiver allow children to express and discuss their emotions with the caregiver. In return, a sensitive caregiver meets the child's emotions with openness and discusses them in a way that helps children understand and regulate their emotions (Fearon & Belsky, 2004; Thompson, 2016). These skills, learned within the context of a secure attachment relationship, make secure children better equipped to cope with stressful situations in their environments.

Comparatively, insensitive or disrupted caregiving and insecure attachment are expected to increase risk for later psychopathology through a suboptimal developmental path (Kobak et

al., 2006). Insecure children may have a reduced ability to cope with stressful situations within and even beyond the child-caregiver relationship. Insecure children may be unable to learn adequate emotion regulation skills within the child-caregiver relationship (see Thompson, 2016), thereby reducing their ability to cope with stressful situations and increasing the risk for maladaptation.

Externalizing Behaviors in the School Years

One of the most frequent markers of maladaptation in children is externalizing behaviors. Externalizing behaviors comprise a range of behaviors by which children exert negative actions toward the external environment (Liu, 2004). Examples of such behaviors include aggression, noncompliance, delinquency, hyperactivity, and poor impulse regulation. These behaviors are related to anger, impulsivity, and reduced emotion regulation (Eisenberg et al., 2001). Many of the behaviors considered regrouped under the rubric of externalizing behaviors are seen as normal by caregivers when children are young, because they are not yet fully able to regulate their behaviors (Calkins & Fox, 2002). Once children reach kindergarten, it is expected that children's newly developed self-regulation skills allow them to 'outgrow' externalizing behaviors (Belsky et al., 2007; Tremblay, 2010). Some children continue, however, to engage in externalizing behaviors during later developmental periods, often because they remain unable to regulate their emotions and behaviors (Gilliom & Shaw, 2004). Children who engage in externalizing behaviors during the school years are at risk for later maladaptation, such as delinquent, criminal, and violent behaviors, social difficulties, and school failure (see Perry et al., 2018). Some studies find that school-aged boys with externalizing behaviors, but not girls, are at risk of later violent and nonviolent delinquency (Broidy et al., 2003).

There is still debate to this day about the ways that gender contributes to different levels of externalizing behaviors in children (Campbell et al., 2010; Crick & Zahn-Waxler, 2003). Some studies report that boys engage in more externalizing behaviors than girls (Broidy et al., 2003), and that boys are more likely to act out through physical aggression than girls (Tremblay, 2010). This gap is believed to widen with age, such that in adulthood, men present more externalizing behaviors than women, as supported by an American national survey of over 43,000 adults (Eaton et al., 2012). However, other studies identified similar trajectories and levels of externalizing behaviors in boys and girls (Odgers et al., 2008; Perry et al., 2018). Despite these conflicting reports, it is possible that distinct precursors put boys and girls differentially at risk for externalizing behaviors. It is thus imperative to understand which precursors, such as child-caregiver attachment, predict the maintenance of externalizing behaviors during the school years among boys and girls.

Existing Literature on Attachment and Externalizing Behaviors

Research on child-caregiver attachment and externalizing behaviors typically considers whether externalizing behaviors are predicted by (a) child-mother attachment, and (b) child-father attachment. Consistent with most work in attachment research, the majority of studies examined infant-mother attachment in relation to later externalizing behaviors. For the most part, the studies relied on behavioral attachment assessments (e.g., Strange Situation Procedure [SSP]) and were summarized in a 2010 meta-analysis (Fearon et al., 2010). A more recent research agenda aims at examining the independent influence of child-father attachment on externalizing behaviors (e.g., Bureau et al., 2020; Goffin et al., 2018; Kochanska & Kim, 2013); such studies were not included in the Fearon and colleagues (2010) meta-analysis for only one study met their inclusion criteria at the time.

Recent work on child-father attachment has also expanded beyond independent effects to consider the joint effects of child-father and child-mother attachment. This is in line with calls for the application of a family systems approach to the study of attachment (Cowan & Cowan, 2019; Fagan, 2020). This approach suggests that different systems within the family coexist and influence one another. For example, child-father and child-mother attachment do not exist in isolation from one another. The inclusion of both attachments and their joint effect is necessary to understand how child-caregiver attachment shapes children's socioemotional adaptation. The integrative hypothesis proposes a conceptualization of the joint effect of child-mother and child-father attachment (Dagan & Sagi-Schwartz, 2018). Under the *additive hypothesis*, a child benefits from more optimal developmental outcomes when they present a secure attachment to both caregivers, compared to children who present one or no secure attachment. Children with two insecure attachments present the least optimal developmental outcomes. This hypothesis thus suggests benefits of presenting secure attachments to both caregivers, and cumulative risks of presenting insecure attachments to both caregivers. In contrast, the *buffering hypothesis* suggests that having one secure attachment buffers against an insecure attachment. Children with one or two secure attachments benefit from more optimal developmental outcomes, while only children with two insecure attachments suffer from least optimal developmental outcomes. Although the integrative hypothesis proposes an interesting way of understanding children's development, work in this area is only burgeoning (Dagan & Sagi-Schwartz, 2018).

Child-Mother Attachment and Externalizing Behaviors

Fearon and colleagues' (2010) meta-analysis on child-mother attachment and externalizing behaviors included 69 studies and 5,947 participants. These studies assessed child-

mother attachment through an observational measure (e.g., SSP) and children's externalizing behaviors before age 12 through questionnaires, observation, or clinical interview.

The meta-analysis identified a robust, small to moderate relationship between child-mother attachment insecurity and externalizing behaviors (d = .31, p < .01, 95% CI: 0.23, 0.40), showing that insecure children present more externalizing behaviors than secure children. The meta-analysis also considered potential moderators of this relationship. The most pertinent variables for the purposes of the current study are children's gender and the study's coding system (i.e., infancy or preschool coding system). Results showed that gender was a significant moderator of the relationship between child-mother insecure attachment and externalizing behaviors, which was only significant for boys (d = .35, p < .01, 95% CI: 0.17, 0.54), but not for girls (d = -.03, 95% CI: -0.16, 0.11). The coding system was not a significant moderator, and the effect size specific to preschool attachment (d = .37, p < .01, 95% CI: 0.16, 0.57) did not differ from that of infant attachment. These results show that child-mother attachment insecurity, as a whole, predicts more externalizing behaviors in boys.

In addition to this analysis, Fearon and colleagues (2010) delved into the relation between specific insecure attachment types and externalizing behaviors. Child-mother avoidant attachment was significantly associated with externalizing behaviors (d = .12, p < .01, 95% CI: 0.03, 0.21); however, there were too few studies in this analysis and results are to be interpreted with caution. Moderator analysis showed that the effect was significant for boys (d = .19, p < .05, 95% CI = 0.03, 0.36) but not for girls (d = .13, 95% CI: -0.09, 0.34). The effect size specific to preschool attachment did not reach statistical significance (d = .13, 95% CI: -0.11, 0.37). Evidence for an association between child-mother avoidant attachment and externalizing behaviors, especially for preschool attachment, remains limited.

The meta-analysis also considered the relation between resistant child-mother attachment and externalizing behaviors (Fearon et al., 2010). The relationship failed to reach significance (d = .11, 95% CI: -0.04, 0.26), and did not vary as function of children's gender (girls: d = .16, 95% CI: -0.20, 0.52; boys: d = .16, 95% CI: -0.02, 0.24). Although the moderator analysis for coding system was not significant, it is worth noting that the association between preschool ambivalence and externalizing behaviors was significant (d = .25, p < .05, 95% CI: 0.05, 0.45). This may suggest that there is a particular association between externalizing behaviors and resistance in the preschool years, which may not extend to assessments of attachment in other developmental periods.

Lastly, the meta-analysis considered the association between disorganized child-mother attachment and externalizing behaviors (Fearon et al., 2010). This relation was significant (d = .34, p < .01, 95% CI: 0.18, 0.50), such that children with a disorganized attachment exhibited more externalizing behaviors. This relationship, however, differed considerably based on gender. Disorganized boys presented more externalizing behaviors than other children (d = .35, p < .05, 95% CI = 0.03, 0.66), while disorganized girls presented *fewer* externalizing behaviors than their peers (d = -.20, p < .01, 95% CI: -0.39, -.01). This puzzling result was only briefly mentioned, but not thoroughly explained by the authors. The coding system was not a significant moderator, and the effect size specific to preschool attachment was also significant (d = .50, p < .01, 95% CI: 0.16, 0.84). These results show an effect of child-mother behavioral disorganization on externalizing behaviors that vary based on children's gender.

This meta-analysis provides a reliable synopsis of the literature on child-mother attachment and externalizing behaviors, yet it also presents some limitations when applied to preschool attachment. First, gender and coding systems were analyzed as separate moderators.

Results pertaining to gender were derived from the entire sample of studies (which included infant attachment) and were not specific to preschool attachment. It is possible, however, that the effect of child gender in the relationship between child-caregiver attachment and externalizing behaviors becomes more salient as children age. The gap in externalizing behaviors between boys and girls widens as children age (Broidy et al., 2003), which may result in even more differentiated links between preschool attachment and externalizing behaviors based on children's gender. In addition, the meta-analysis had a focus on infant attachment, meaning that attachment types specific to the preschool years (i.e., controlling-caregiving and controlling-punitive) were not examined. Extant literature points to important differences for these two attachment types. For example, in a socio-economically diverse sample of Canadian mothers, controlling-punitive children presented significantly more externalizing behaviors than secure children, whereas this relationship was only marginal for behaviorally disorganized children (Moss et al., 2004). The relation between controlling-caregiving attachment and externalizing behaviors was not significant (Moss et al., 2004). These results were consistent with those of a large national American sample (National Institute of Child Health and Human Development Study of Early Child Care Research Network; N = 1,364; O'Connor et al., 2011). This study found that controlling-punitive preschoolers were rated by their mothers as more disruptive than controlling-caregiving and behaviorally disorganized preschoolers. Controlling-caregiving preschoolers presented the lowest levels of disruptive behaviors (M = 10.19), comparable to levels of secure (M = 10.54) and insecure-organized preschoolers (M = 10.56). Results from the Moss and O'Connor studies suggest an association between externalizing behaviors and child-mother controlling-punitive, but not controlling-caregiving attachment. They, however, do not provide insight into possible gender differences in these associations.

Child-Father Attachment as an Independent and Joint Predictor of Externalizing Behaviors

Despite little research on child-father relationships, increasing theoretical and empirical evidence points to the unique importance of child-father interactions on children's socioemotional adaptation, particularly for elements such as externalizing behaviors. For example, paternal sensitivity promotes positive development in children across different domains (Rodrigues et al., 2021). According to activation theory, this may be because fathers open up their children to unfamiliar settings in the larger environment, and encourage them to take more risks in new situations (Paquette, 2004). Fathers achieve this through structured yet challenging play activities such as rough-and-tumble play. These interactions help children understand and regulate their emotions better, which contribute to more positive interactions with their peers (Carson et al., 1993). A recent literature review and meta-analysis confirmed that fathers' physical play predicted lower aggression (N = 1,521, k = 16; StGeorge & Freeman, 2017). Broader studies on fathers support the idea that child-father relationships are of a unique importance for the development of externalizing behaviors in children.

Infant Attachment. Limited studies have examined how child-father attachment predicts externalizing behaviors (Brown & Aytuglu, 2020). Among these, some considered children's attachment representations to fathers through doll-play tasks (e.g., Verschueren & Marcoen, 1999), while only a handful of studies assessed behavioral attachment through the SSP or the separation-reunion procedure. Kochanska and Kim (2013) assessed child-mother and child-father attachment in the SSP at 15 months and children's behavior problems at 6.5 and 8 years as rated by teachers, mothers, and fathers. They found an additive effect by which children with two secure attachments presented the lowest levels of teacher- and child-rated behavior problems, and children with two insecure attachments presented the most behavior problems. In addition,

the study further delved into comparisons based on the Ainsworth continuous scales of attachment insecurity (Kochanska & Kim, 2013). Avoidant child-mother and child-father attachment presented no independent or joint influence on behavior problems. Resistant attachment followed a buffering model by which two highly resistant attachments predicted more behavior problems (i.e., worse outcomes). Lastly, disorganized attachment followed an independent model, by which only child-father disorganization predicted higher levels of mother-rated externalizing behaviors (Kochanska & Kim, 2013). The results for security were further replicated in the same sample, but using a continuous measure of attachment security (Attachment Q-Sort) at age 2. Indeed, children with two secure attachments presented fewer behavior problems at 8 years old, while children with two insecure attachments presented the most behavior problems (Boldt et al., 2014). In this sample, there was also further support for an independent model, by which the child-father attachment security at age 2 predicted fewer antisocial behaviors at age 12, while child-mother attachment and the joint effect were not significant predictors (Goffin et al., 2018). These studies show that different models may apply to each attachment pattern when predicting externalizing behaviors. Some attachment patterns may be better represented with an additive model (e.g., security), while others may follow an independent model (e.g., disorganization). These studies do not provide support for a buffering model. Although informative, these studies did not examine preschool attachment, nor did they examine whether these results varied based on children's gender.

Preschool Attachment. In the preschool years, the only studies available on child-father attachment and externalizing behaviors are the ones conducted with the sample of this dissertation (Bureau et al., 2017, 2020; Deneault et al., 2020). A first study examined whether attachment security/insecurity to fathers in the preschool years predicted concurrent conduct

problems (Bureau et al., 2017). This study found a main effect of child-father attachment security in the prediction of conduct problems in children, along with a joint effect by which children with two insecure attachments presented the most conduct problems. A later study examined whether child-father attachment security/insecurity in the preschool years also predicted child-reported externalizing behaviors in middle childhood (Bureau et al., 2020). This study also identified an additive effect, by which children with two secure attachments presented fewer externalizing behaviors than children with one or no secure attachment. These two studies were only able to report on secure/insecure differences due to the sample size and the categorical nature of the attachment assessment (Deneault et al., 2020). It is nonetheless important to understand how individual insecure attachment patterns (i.e., avoidance, ambivalence, behavioral disorganization, controlling-caregiving, and controlling-punitive) independently and jointly predict externalizing behaviors (DeKlyen & Greenberg, 2016).

Thus far, only one study has examined insecure patterns of preschool attachment individually with a continuous measure of preschool attachment. This study revealed that child-father ambivalence and behavioral disorganization were associated with higher levels of externalizing behaviors in children (Deneault et al., 2020). However, the study did not examine the joint effects of child-father attachment and child-mother attachment, and was limited to concurrent effects. Because a core premise of attachment theory is the lasting influence of attachment relationships on adaptation, it is important to examine whether child-father and child-mother attachment in the preschool years hold a lasting influence on children's externalizing behaviors beyond the preschool years. Middle childhood is particularly well suited to the study of externalizing behaviors in a longitudinal design. Indeed, by middle childhood, most children outgrow 'typical' early childhood externalizing behaviors (Tremblay, 2010), which allows to

isolate children who truly present difficulty in this area. In addition, past work on preschool attachment failed to consider whether there are differences in these relationships based on child gender (Bureau et al., 2017, 2020; Deneault et al., 2020), despite evidence showing different associations between child-caregiver attachment and externalizing behaviors across genders (Fearon et al., 2010). To our knowledge, no study has examined the independent and joint influence of preschool child-father and child-mother attachment on later externalizing behaviors across children's gender.

Current Study

The current study aims to address limitations in the extant literature on preschool child-father and child-mother attachment and externalizing behaviors using the *Preschool Attachment Rating Scales* (e.g., Deneault et al., 2020). The advantages of the PARS over categorical assessments of attachment allow us to address a number of limitations. First, the PARS allow us to examine the relation between all of the preschool attachment types and children's externalizing behaviors. To our knowledge, this study is the first to examine the link of preschool avoidance, ambivalence, behavioral disorganization, controlling-caregiving, and controlling-punitive attachments in child-father dyads with later externalizing behaviors. Second, the increased statistical power of the PARS over attachment classifications allowed to further divide the sample to compare the relation between child-caregiver attachment and externalizing behaviors across children's genders. Third, the PARS allow to consider the joint effects of child-father and child-mother attachment for all attachment types. With categorical measures, only a secure vs. insecure comparison is usually possible for joint effects (Dagan & Sagi-Schwartz, 2018), limiting the understanding of insecure attachment types. In contrast, the PARS allow for the assessment of interactive, joint effects between all attachment styles. This study uses the

unique characteristics of the PARS to address important limitations pertaining to child-father and child-mother preschool attachment.

Another important contribution of this study is the longitudinal design which investigates whether the influence of preschool attachment on externalizing behaviors is maintained when externalizing behaviors are assessed in a later developmental period. Such longitudinal studies are essential to establish a relationship between early attachment and later socioemotional functioning (Achenbach & Rescorla, 2006), especially in assessments of post-infancy attachment (Kobak et al., 2006). This period is commonly used to study the longitudinal effect of attachment, but rarely in the context of multiple caregivers (Kerns & Brumariu, 2016).

Objectives and Hypotheses

The current study aimed to address limits in preschool child-father and child-mother attachment by asking whether the six types of preschool child-father and child-mother attachment (i.e., security, avoidance, ambivalence, behavioral disorganization, controlling-caregiving, and controlling-punitive) predict children's externalizing behaviors in middle childhood. We also asked whether these results vary as a function of children's gender.

We tested three hypotheses: (a) an independent hypothesis in which child-father and child-mother attachment independently predict externalizing behaviors, (b) an additive hypothesis in which high levels of security to both parents predict fewer externalizing behaviors and high levels of insecurity to both parents predict more externalizing behaviors, and (c) a buffering hypothesis in which having high levels of security toward one parent buffer against the effect of low security toward the other parent, and in which having high levels of insecurity toward one parent does not predict more externalizing behaviors if insecurity toward the other parent is low. Based on past studies, we expected high child-father security in boys to predict

fewer externalizing behaviors, and expected this effect to be stronger when child-mother security was also high. We did not expect to find a relation between avoidance and externalizing behaviors for boys or for girls. We expected child-father and child-mother resistant attachment in boys to predict more externalizing behaviors; this effect was hypothesized to be stronger when ambivalence to both parents was high. Child-father and child-mother behavioral disorganization in boys were expected to predict more externalizing behaviors, while we expected lower levels for girls. We did not expect controlling-caregiving attachment in boys or in girls to predict externalizing behaviors. Lastly, we expected controlling-punitive attachment to predict externalizing behaviors, although we did not provide a detailed account for boys/girls or parents given that this question was rather exploratory.

Method

Participants

Participants in the current study were part of a larger longitudinal study on child-parent attachment in the preschool years and socioemotional adaptation (Bureau et al., 2014, 2017, 2020; Deneault et al., 2020). The original sample included 157 preschool-aged children and their parents recruited from a low-risk population in a large Eastern Canadian city between 2009 and 2013. Recruitment methods included radio, newspapers, and online advertisements. The eligibility criteria consisted of (a) having a 3- to 5-year-old child (b) that lives with both parents. Step-parents (n = 1) and non-biological parents (n = 1) were eligible to participate provided that they were a parental figure and resided with the child for at least two years.

Time 1

The study sample included 144 children (M = 46.89 months, SD = 8.77, 83 girls) who completed an assessment of child-parent attachment with both parents at Time 1. A majority of

families were English-speaking (79.2%) while the rest were French-speaking (20.8%). Parents primarily identified as White (84.7% of fathers and mothers). The rest of fathers identified as Asian (7.6%), Middle Eastern (4.2%), Black (2.1%), Indigenous (0.7%), and Latino (0.7%), while the rest of mothers identified as Asian (6.3%), Middle Eastern (4.2%), Black (3.5%), and Indigenous (1.4%). Most parents had completed a university degree (63.9% of fathers and 71.1% of mothers) and were not at socioeconomic risk (20.1% reported a gross household annual income below $75,000). The sociodemographic characteristics of the sample are consistent with the region's population (Statistics Canada, 2017).

Time 2

Families were invited to participate in the second time point of the study approximately five years after their participation at Time 1 (i.e., if children were 3 years old at Time 1, they were approximately 8 years old at Time 2; if children were 5 years old at Time 1, they were approximately 10 years old at Time 2). A research assistant contacted parents via email or telephone to explain in what consisted this part of the study; 102 families accepted to participate (70.83%). The remaining 42 families did not participate for the following reasons: 30 never replied or were unavailable to participate, 6 were separated and refused to participate, 4 were unreachable (i.e., they had changed phone number and email address), and 2 had moved away and refused to participate. A comparison of families who had participated in Time 2 and those who did not participate revealed no systematic difference on key sociodemographic variables at Time 1: children's gender ($\chi 2$ [144] = 2.63, p = .11), household income (F[1, 142] = 0.36, p = .55), paternal education (F[1, 142] = 3.93, p = .06), maternal education (F[1, 142] = 2.63, p = .11), paternal ethnicity ($\chi 2$ [144] = 0.82, p = .37), and maternal ethnicity ($\chi 2$ [144] = 0.15, p = .70).

Among families who participated in Time 2, 98 completed the questionnaires on their children's externalizing behaviors at ages 7 to 12 (M = 104.22 months, SD = 13.11, 61 girls). The majority of the families who completed the assessments at Time 2 were English-speaking (80.61%) while the rest were French-speaking (19.39%). Fathers identified as White (83.67%), Asian (8.16%), Middle Eastern (4.08%), Black (3.06%), and Latino (1.02%). Mothers identified as White (83.67%), Asian (7.14%), Black (4.08%), Middle Eastern (4.08%), and Indigenous (1.02%). A majority of fathers (68.37%) and mothers (83.67%) had completed a university degree. Only 15.3% reported a gross household income below $75,000. The sociodemographic characteristics of the sample are consistent with the region's population (Statistics Canada, 2017).

Procedure

Time 1. Children completed an independent laboratory visit with their father and their mother. Visits occurred six months apart in a counterbalanced order and lasted two hours. The length of time between the visits ensured that children did not or only minimally remembered tasks from the first visit. Parents provided written consent and children provided verbal assent to participate in the study. Child-parent dyads completed a modified strange situation procedure adapted to the preschool years, the separation-reunion procedure (Cassidy et al., 1992). This procedure involves a pre-separation and a series of two separations and reunions, each lasting for 5 minutes. During separations, the parent steps away from the testing room, leaving the child alone with age-appropriate toys. The reunions see the parent returning to the testing room. The separation-reunion procedure is video-recorded and later coded for children's attachment behaviors. Following this procedure, parents completed a series of questionnaires, including one on their sociodemographic information, while children were completing activities with a research

assistant in an adjacent room. Parents received a monetary compensation for their participation and children received a toy.

Time 2. Parents were invited to complete a series of questionnaires five years after their participation in Time 1 of the study. Each of the parents received a secure hyperlink to complete the online questionnaires. These questionnaires included questions on children's socioemotional adaptation and on the family's sociodemographic information. Parents received a monetary compensation for completion of the questionnaires. The institution's Research Ethics Board approved all procedures and measures used in Time 1 and Time 2.

Instruments

Continuous Measure of Child-Parent Attachment. We used the *Preschool Attachment Rating Scales* (PARS; Moss et al., 2015) to assess children's attachment behavior during the separation-reunion procedure. The PARS yield a continuous score of attachment on six scales reflecting different preschool attachment patterns: security, avoidance, ambivalence, behavioral disorganization, controlling-caregiving, and controlling-punitive. Possible scale scores range from 1 to 9 based on the presence or absence of indicators of each attachment pattern. Coders assign a single score on each scale based on the entire procedure and all modalities of children's behaviors (see Study 1).

Secure children display a calm enjoyment of the caregiver during the separation-reunion procedure. If these children become distressed upon separation, they are able to derive comfort from the caregiver and to resume exploration. Avoidant children seek to maintain neutrality in interactions with their caregiver. They show little distress upon separation from their caregiver, and little interest in interacting with the caregiver upon their return. The interaction is focused on exploration. Ambivalent children place an exaggerated focus on dependency from the caregiver,

to the detriment of exploration. Ambivalent children may display considerable distress upon separation, distress that is not soothed by the caregiver's return. These children may also show anger, struggle, and resistance when interacting with the caregiver. Behaviorally disorganized children display odd, contradictory, disorganized behaviors that are similar to disorganized behaviors displayed by infants. These children do not have a coherent strategy to interact with their caregiver, who may be both a source of fear and comfort for them. Controlling-caregiving children try to control the interaction with their caregiver through entertaining, cheery, and caring behaviors. These children may neglect their own needs in so doing. Lastly, controlling-punitive children try to control the interaction through hostile, derogatory, and punitive commands directed at humiliating the parent.

The PARS present adequate psychometric properties (Deneault et al., 2020). Indeed, they present good inter-rater reliability and convergent validity with the PACS. In addition, they are associated with parental sensitivity and concurrent child externalizing behaviors. The association with externalizing behaviors presents incremental validity over the PACS (Deneault et al., 2020).

Three coders used the PARS to code children's attachment behavior. One was a developer of the PARS while the other two received training and certification for achieving an excellent level of reliability on a separate set of tapes. The coders only rated one child-parent dyad per family (i.e., if they coded child-father attachment, they did not code child-mother attachment). The coders were also blind to other study variables. Inter-rater reliability, based on 20% of the cases (29 child-father tapes and 29 child-mother tapes) revealed good to excellent reliability on all scales (Cicchetti, 1994). Indeed, intraclass correlations (ICC) ranged from .88 to .96 for child-mother scales, and from .81 to .92 for child-father scales, with the exception of the

punitive child-father scale which had an ICC of .60 due to its low frequency in the sample (see Deneault et al., 2020).

Parent-Reported Socioemotional Adaptation. At Time 2, fathers and mothers completed the *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997) to report on their child's socioemotional adaptation. The SDQ comprises 25 items pertaining to children's positive and negative behaviors, rated as "Not true", "Somewhat true", and "Certainly true". This questionnaire yields 5 scales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviors. The externalizing scale is computed as the sum of the conduct problems and hyperactivity/inattention scales. The SDQ presents good psychometric properties and strong correlations with the Child Behaviour Checklist (Achenbach, 1991; Goodman & Scott, 1999; Stone et al., 2010). To reduce the number of analyses, this study examined averaged scores of fathers' and mothers' reports (significantly correlated with an r = .62, $p < .001$) on the externalizing scale ($\alpha = .87$).

Analytical Strategy

We conducted preliminary analyses, descriptive analyses, and correlations using R (R Core Team, 2020) and the *psych* (Revelle, 2020) and *dplyr* packages (Wickham et al., 2020). We first examined patterns of missing data and normality postulates for the study variables. We also considered the association between potential covariates, child age and family income, and study variables. We then computed correlation analyses using the full-information maximum likelihood (FIML) estimator to account for missing data. The next step of the analysis was to conduct multi-group regression models using Mplus 7.0 (Muthén & Muthén, 2012), with gender as the grouping variable. Prior to testing the models, we mean-centered the attachment variables to reduce multicollinearity and created interaction terms. We tested a model for each attachment

type, in which child-father attachment, child-mother attachment, and their interaction were predictors of children's externalizing behaviors. These models also accounted for child age and family income as covariates. If the interaction term was a significant predictor of externalizing behaviors, we tested the interaction using Aiken and West's (1991) technique to examine simple slopes. Child-father attachment was the predictor and child-mother attachment the moderator. The relation between child-father attachment scales and externalizing behaviors were examined at low, medium, and high values of child-mother attachment, that is 1, 5, and 7. We chose these values instead of the typical values (low values being represented by -1 SD below the mean, medium values by the mean, and high values by +1 SD above the mean; Aiken & West, 1991) for two main reasons. First, these values represent agreed upon low, medium, and high values of attachment behaviors based on different attachment coding systems (e.g., Cassidy et al., 1992; Main & Cassidy, 1987; Moss et al., 2015). Second, choosing values that are aligned with anchor points of attachment scales make the findings more interpretable and allow for a more accurate representation of insecure attachment scales.

Results

Preliminary Analyses

The analyses relied on the whole sample of children that completed a separation-reunion procedure at Time 1 (n = 144). We first examined missing data in the current study. Time 1 variables did not have missing data. Because some families did not return to participate in Time 2 (see Participants section), Time 2 variables presented missing data: 28.5% for child age and family income, and 31.9% for externalizing behaviors. This level of missing data is within the norms for longitudinal research in the attachment field (e.g., Dutra et al., 2009). Little's MCAR test revealed that data were missing completely at random (χ^2 = 33.72, p = .29). We thus

included all observations (n = 144) and relied on the FIML estimator to account for missing data (see Enders, 2001). The use of maximum likelihood to handle missing data is considered one of the preferred methods to handle missing data in longitudinal data, and this method is preferable to alternatives such as listwise deletion (Enders, 2012; Jeličić et al., 2009). This method is suitable to handle moderate to high rates of missing data (Widaman, 2006), as is the case in this study.

Normality analyses revealed a small positive skew on the externalizing behaviors variable. A square root transformation normalized the variable. We then explored potential control variables. Child age and family income at Time 1 were put in relation with child-father and child-mother attachment scales, while child age and family income at Time 2 were put in relation with children's externalizing behaviors. Correlation analyses using the FIML estimator to account for missing data revealed the following significant associations (see Table 3.2). Child-mother attachment security was associated positively with child age for sons (r = .266, p = .038). There were no associations between child-father scales and child age or family income in boys. In girls, the child-mother controlling-caregiving scale was positively associated with child age (r = .243, p = .027), while the controlling-punitive scale presented a negative correlation with family income (r = -.269, p = .014). Child age in girls was positively associated with child-father avoidance (r = .228, p = .038) and negatively associated with child-father ambivalence (r = -.258, p = .019). Lastly, externalizing behaviors at Time 2 were negatively associated with family income at Time 2 in boys (r = -.387, p = .002). These associations prompted us to control for child age at Time 1 and family income at Time 2 in the regression and interaction analyses.

Descriptive statistics of child-father, child-mother attachment, and children's externalizing behaviors are presented in Table 3.1. The table also reports on gender differences

for the main study variables. The analyses revealed that girls presented higher scores on the controlling-caregiving scale than boys did, for both child-mother and child-father attachment. Boys presented higher behavioral disorganization toward their fathers than girls did. Lastly, parents reported that boys were engaging in more externalizing behaviors than girls.

Correlation Analyses

Zero-order correlation analyses examined the association between child-father and child-mother attachment scales at Time 1 and children's externalizing behaviors at Time 2 (see Table 3.2). These correlations used the FIML indicator to account for missing data. When first considering the results for boys, child-father attachment security was negatively associated with externalizing behaviors (r = -.357, p = .005). Child-father ambivalence was positively associated with externalizing behaviors (r = .305, p = .017). In contrast, there was no significant association between child-mother attachment scales and boys' externalizing behaviors.

When considering the results for girls, there were no significant association between child-father attachment scales and externalizing behaviors. The analyses revealed one significant association between child-mother attachment scales and externalizing behaviors. The child-mother controlling-punitive scale predicted higher levels of externalizing behaviors (r = .289, p = .008).

Multi-Group Regression Models

Security. We conducted a multi-group regression model using the FIML indicator, in which child-father and child-mother security as well as their interaction were the predictors of children's externalizing behaviors. Child age and family income were also included as control variables. As depicted in Figure 1, higher child-father attachment security predicted fewer externalizing behaviors in boys (β = -.43, p < .001). Child-mother security and the interaction

were not significant predictors of boys' externalizing behaviors. There were no significant predictors of girls' externalizing behaviors. These results support a main effect hypothesis for child-father attachment security in boys.

Avoidance. We adopted the same strategy to examine the relation between avoidance and externalizing behaviors. Results of the multi-group regression model are presented in Figure 2. Child-father and child-mother avoidance, along with their interaction, were not significant predictor of boys' or girls' externalizing behaviors. These results do not support any association between attachment avoidance and externalizing behaviors.

Ambivalence. We applied the same strategy to attachment ambivalence (see Figure 3). In boys, higher child-father ambivalence scores predicted higher levels of externalizing behaviors ($\beta = .49$, $p < .001$). Child-mother ambivalence was not a significant predictor of boys' externalizing behaviors, but the interaction of child-father and child-mother ambivalence was significant ($\beta = .39$, $p = .002$). We prompted this interaction using simple slopes at three levels of child-mother ambivalence (see Figure 4): low ambivalence (ambivalence score of 1), medium ambivalence (ambivalence score of 5), and high ambivalence (ambivalence score of 7). At low levels of child-mother ambivalence (score of 1), the association between child-father ambivalence and externalizing behaviors was marginally significant ($\beta = .23$, $p = .07$). The relation between child-father ambivalence and externalizing behaviors was significant at medium levels (score of 5; $\beta = .61$, $p < .001$) and high levels of child-mother ambivalence (score of 7; $\beta = .58$, $p < .001$). These results support the presence of a main effect of child-father ambivalence for externalizing behaviors, along with a buffering model by which two mid- or high-ambivalence scores predict more externalizing behaviors.

Behavioral Disorganization. The multi-group regression model for behavioral disorganization is presented in Figure 5. In boys, higher child-father behavioral disorganization predicted more externalizing behaviors ($\beta = .29$, $p = .03$). Child-mother behavioral disorganization and the interaction term did not predict boys' externalizing behaviors. In girls, child-father and child-mother behavioral disorganization did not predict externalizing behaviors. The interaction term was, however, a predictor of girls' externalizing behaviors ($\beta = -.29$, $p < .001$). We prompted this interaction using simple slopes at three levels of child-mother behavioral disorganization (see Figure 6): low behavioral disorganization (behavioral disorganization score of 1), medium behavioral disorganization (behavioral disorganization score of 5), and high behavioral disorganization (behavioral disorganization score of 7). The association between child-father behavioral disorganization and externalizing behaviors was not significant at low levels ($\beta = -.06$, $p = .58$) of child-mother behavioral disorganization. The relation between child-father behavioral disorganization and externalizing behaviors was, however, significant at medium ($\beta = -.45$, $p < .001$) and high levels of child-mother behavioral disorganization ($\beta = -.46$, $p < .001$). These results support the presence of an interaction effect between parents, by which daughters who present high behavioral disorganization toward both parents present low levels of externalizing behaviors.

Controlling-Caregiving. The model for controlling-caregiving attachment is presented in Figure 7. Child-parent controlling-caregiving attachment and their interaction were not significant predictors of boys' or girls' externalizing behaviors. These results do not support any association between child-parent controlling-caregiving attachment and externalizing behaviors.

Controlling-Punitive. We computed the multi-group regression model for controlling-punitive attachment. There was, however, too little variance among boys for the model to

terminate properly. We thus concentrate on results for girls, which are presented in Figure 8. Child- father controlling-punitive attachment ($\beta = .29$, $p = .008$) and child-mother controlling-punitive attachment ($\beta = .48$, $p < .001$) were both significant predictors of daughters' externalizing behaviors. The interaction between child-father and child-mother controlling-punitive attachment was also a significant predictor ($\beta = .23$, $p = .04$). We prompted this interaction using simple slopes at three levels of the child-mother controlling-punitive scale (see Figure 9): low controlling-punitive scores (score of 1), medium controlling-punitive scores (score of 5), and high controlling-punitive scores (score of 7). The association between child-father controlling-punitive scores and externalizing behaviors was not significant at low levels ($\beta = .11$, $p = .33$) of child-mother controlling-punitive behaviors. The relation between child-father controlling-punitive attachment and externalizing behaviors was, however, significant at medium ($\beta = .25$, $p = .02$) and high levels of child-mother controlling-punitive attachment ($\beta = .24$, $p = .03$). These results support the presence of an interaction effect between parents, by which daughters present high levels of externalizing behaviors when they present high controlling-punitive behaviors toward both parents. These results support the presence of a main effect of child-father and child-mother controlling-punitive attachment for externalizing behaviors, along with a buffering model by which two mid- to high- controlling attachments predict more externalizing behaviors.

Discussion

This study aimed at addressing limitations in the extant literature on child-caregiver attachment and externalizing behaviors. Even among child-mother attachment research, little research considers insecure types of preschool attachment individually. In addition, only a few studies have examined child-father attachment and its interaction with child-mother attachment

as predictors of externalizing behaviors. Among this work, very few considered the influence of children's gender on this relation. We examined whether preschool child-father attachment, preschool child-mother attachment, and their interaction predict externalizing behaviors in middle childhood boys and girls. To do so, we relied on the PARS, which allow to consider the association between each preschool attachment type and externalizing behaviors. The results revealed different patterns for child-father and child-mother attachment, which further varied based on the attachment types and child gender.

Child-Father Security Predicts Fewer Externalizing Behaviors

The results indicated that child-father security predicts fewer externalizing behaviors, but only in boys. The gender difference replicates the pattern found in the meta-analysis of child-mother attachment, but with fathers instead of mothers. The meta-analysis found that child-mother security only predicted fewer externalizing behaviors in boys (Fearon et al., 2010), while we found this result for child-father attachment. This finding is consistent with past research showing that fathers are more influential in their sons' lives, notably because it may be easier for men to interact with boys than girls (McBride et al., 2002). In addition, this result is consistent with past studies showing that child-father attachment in the preschool years is a better predictor than child-mother attachment for certain aspects of children's socioemotional adaptation (using behavioral assessments: Bureau et al., 2017, 2020; using representational assessments: Pinto et al., 2015; Veríssimo et al., 2011; Vershueren & Marcoen, 1999). This may be explained by theories such as activation theory, which postulate that fathers act as primary socialization agents for their children (Paquette, 2004). Notably, the particularities of child-father interactions are such that they promote increased emotional regulation skills that can be applied in social contexts (e.g., at school, at day camp, etc.). In middle childhood, it becomes more important than

ever for children to be competent in social contexts. Social interactions with peers become more central to children's lives. The role of child-father attachment may be more salient at a developmental period focused on social interactions, such as middle childhood, compared to earlier developmental periods during which familial interactions still make up most of children's interactions. The development of attachment security toward a father may thus be an important part of boys' socioemotional adaptation.

In contrast to child-father attachment security, child-mother security did not contribute as an independent or interactive predictor to boys' and girls' externalizing behaviors. Among studies that include both child-father and child-mother attachment (e.g., Boldt et al., 2014; Bureau et al., 2017, 2020; Kochanska & Kim, 2013), the absence of an independent effect of child-mother attachment is common. However, these studies commonly find an interactive effect of child-father and child-mother attachment. Interestingly, the absence of a main effect does not correspond with studies that only include child-mother attachment (Fearon et al., 2010). A trend seems to emerge, by which studies that only include child-mother attachment find a main effect on externalizing behaviors, while those who include both parents do not. It is possible that part of the influence of child-mother attachment in mother-only studies derives from the shared variance with the unassessed child-father attachment. The current study shows the importance of assessing attachment toward both parents to disentangle the unique and joint contributions of child-father and child-mother attachment on children's development.

Avoidant and Ambivalent Attachment Predict Externalizing Behaviors Differently

The results found no association between child-parent avoidance and externalizing behaviors. These results were consistent regardless of the gender of parents and children. Interactive effects were also non-significant. This result is consistent with preschool-only studies

in the Fearon and colleagues (2010) meta-analysis, which failed to find a significant effect of preschool child-mother avoidance on externalizing behaviors. This is also consistent with child-father attachment studies which also did not identify an effect of avoidant attachment (Kochanska & Kim, 2013). As such, preschool avoidance may not be a key risk factor in the development of later externalizing behaviors.

In contrast, child-father ambivalence and the interaction term predicted boys' externalizing behaviors. Higher levels of child-father ambivalence were associated with more externalizing behaviors in boys, but only when child-mother ambivalence was at medium or high levels. The relation reached marginal levels of significance when child-mother ambivalence was low. There was no association for girls. This is in line with results for security, which suggest that child-father attachment is particularly important for the prediction of socioemotional adaptation of their sons. In contrast to security, however, child-mother ambivalence also plays an interactive role for externalizing behaviors. This interactive effect of high externalizing behaviors in the presence of two highly ambivalent attachments is consistent with Kochanska and Kim's (2013) study. The presence of a link, albeit interactive, with child-mother attachment is consistent with meta-analytical results specific to the preschool years (Fearon et al., 2010). It is worth noting that the meta-analysis failed to identify an association between child-mother ambivalence at all ages and externalizing behaviors. It is possible that ambivalence in the preschool years is more relevant for the development of externalizing behaviors. Preschool ambivalence, although still centered on dependency, may be manifested in different ways compared to infant resistance. For instance, ambivalence in the preschool years includes anger, negotiation, and protests. These behaviors may readily translate into externalizing behaviors. This is also consistent with Study 1, which found that child-father ambivalence was a concurrent

predictor of externalizing behaviors. Taken together, results from both studies suggest that ambivalence in the preschool years is a key predictor of concurrent and longitudinal externalizing behaviors.

The results for avoidance and ambivalence should caution against grouping these two attachment types under a single insecure-organized group in future research. It is common for attachment research relying on categorical assessments to group avoidant and ambivalent children under a single insecure-organized group. This is usually done to mitigate lack of statistical power. Yet, our results suggest that this may be inappropriate when studying externalizing behaviors, especially for preschool attachment. The idea that avoidance and ambivalence serve different functions and are thereby associated with different outcomes is not novel (Erickson et al., 1985), but bears repeating. To mitigate power issues, researchers may consider adopting continuous measures of attachment such as the PARS to delve into each attachment type separately.

Different Trajectories of Behavioral Disorganization for Boys and Girls

There were associations between behavioral disorganization and externalizing for boys and girls, although the association was strikingly different based on children's gender. The results for boys followed in the same direction as ambivalence, by which behavioral disorganization toward fathers predicted more externalizing behaviors. The pattern of this result is similar to that of attachment security. Indeed, the result follows what was previously identified in child-mother dyads, but for child-father dyads. As we argued earlier, child-father interactions may be particularly salient for boys' socialization. Boys who develop behavioral disorganization toward their fathers may not have the opportunity to learn how to regulate their emotions and

behaviors through positive child-father interactions. This may make them more prone to angry outbursts in the form of externalizing behaviors (Karlen Lyons-Ruth & Jacobvitz, 2016).

In contrast, behavioral disorganization toward fathers may operate under a different mechanism for girls. While there was no main effect of behavioral disorganization toward either parent, there was an interactive effect. This effect showed that girls who exhibited behavioral disorganization toward both parents at medium and high levels presented fewer externalizing behaviors. This finding is counterintuitive in theory, but consistent with empirical results. Indeed, meta-analytical results found that child-mother disorganized attachment predicts fewer externalizing behaviors in girls (Fearon et al., 2010). The directionality of this finding may be explained by going back to the core idea of behavioral disorganization. The main characteristic of this attachment type is an unresolvable paradox in which the parent is both the source of fear and the source of comfort (Main & Hesse, 1990). In short, the child is frightened when interacting with their parent. During the preschool years, the majority of behaviorally disorganized children come to develop controlling behaviors toward the parent (Moss et al., 2005). This allows children to make the interactions with their parent more predictable and thus less frightening (Solomon et al., 1995). Children who continue to display high levels of behavioral disorganization in the preschool years may not be able to develop behaviors that help them regulate their fears, and thus continue to live in a scary world in which their parents are the cause of fear and comfort. One could imagine that daughters who have high levels of behavioral disorganization toward both parents live in a frightening and distressing familial climate. With fear being their dominating emotion, these daughters might not necessarily start to act out through externalizing behaviors. Notably, they might be scared of their fathers' reactions should they act out. Daughters who do present externalizing behaviors may take another developmental

trajectory, notably by developing punitive behaviors. Comparatively, boys may be more likely to act out through externalizing behaviors as a result of the fear resulting from their behaviorally disorganized attachment relationships. In the face of negative emotions, boys are socialized to display anger, while girls are socialized to display sadness (Eisenberg et al., 1998). These socialization processes may be at the root of the differential results for boys and girls who present behavioral disorganization toward both parents. Although more research will be beneficial in this area, these findings also suggest a different developmental trajectory for disorganized infants who develop punitive behaviors compared to those who remain primarily behaviorally disorganized.

Controlling Attachments Present Different Associations with Externalizing Behaviors

Results indicated that child-parent controlling-caregiving attachment was not associated with externalizing behaviors. This is consistent with past research on child-mother attachment which differentiated caregiving from punitive controlling attachments (Moss et al., 2004; O'Connor et al., 2011). There were no past studies differentiating controlling attachments for child-father attachment. This study suggests that, with respect to the development of externalizing behaviors, child-father and child-mother caregiving attachment may act in similar ways, even among boys and girls. Children who present high levels of controlling-caregiving attachment seem unlikely to burst out into externalizing behaviors. They are generally rated as acting similarly to secure children, perhaps because controlling-caregiving children seek to avoid being a burden to their parent in many ways, including through their behaviors toward others. For example, let us imagine a child who took on caregiving behaviors as their mother was highly depressed and uninvolved in interactions. This child is acting as a mature partner in their interactions with the parent, notably by taking the lead and ensuring that the parents' needs are

met. In trying to promote parental well-being, this child tries not to be a burden for the parent. This child is unlikely to get in trouble at school for example, which could burden the parent with a number of meetings with their teachers or principal. Even if these children were to feel negative emotions, be it anger or exhaustion, they are unlikely to express them through externalizing behaviors. Even if caregiving attachment may not relate to externalizing behaviors, it is still likely to cause maladaptation in other spheres of life. Notably, caregiving young adults present more suicidal ideation and impulsive self-damaging behaviors (Lyons-Ruth et al., 2009). Caregiving may even relate to Borderline Personality Disorder (Gunderson & Lyons-Ruth, 2008). As such, caregiving attachment, be it directed toward a father or a mother, and exerted by a boy or a girl, may not promote the development of externalizing behaviors in children, although it may promote other maladaptive behaviors.

Controlling-punitive attachment, directed toward fathers or mothers, and the interaction term were significant predictors of externalizing behaviors in girls. Variance in scores of controlling-punitive attachment among boys was too small to test the model with boys. From a theoretical standpoint, we may expect similar associations among boys, especially given that attachment types of a similar nature (i.e., ambivalence and behavioral disorganization) that share a common root in anger and resistance predicted more externalizing behaviors for boys in this sample. The results of controlling attachment are once more in line with studies that distinguished controlling types, which found that punitive children presented the most externalizing behaviors (Moss et al., 2004; O'Connor et al., 2011). If we dive back to the root of punitive attachment, this is not a surprising finding. Punitive boys and girls are likely to exhibit behaviors that could be considered like externalizing behaviors which are addressed to the parent (e.g., aggressiveness), even in the laboratory assessment of attachment. For example, punitive

children may be hostile or aggressive toward the parent, or noncompliant in refusing to speak or listen to the parent (Cassidy et al., 1992; Moss et al., 2015). These behaviors often go unaddressed and unpunished by the parent. Children are unlikely to learn from interactions with their parents that these externalizing behaviors are inappropriate, and may continue using them within their everyday life. This is very different from caregiving children, and supports the need to distinguish between these different controlling subtypes. Thus, boys and girls who develop a punitive attachment toward their parent are likely to exhibit externalizing behaviors. That being said, the controlling-punitive attachment pattern toward fathers had not been assessed before the current study, except for the first study of this dissertation. There is a need for future studies that examine whether this attachment pattern is more likely to occur toward mothers than fathers, due to a modeling effect of the father's behavior toward the mother. Alternatively, socialization theory may suggest that mothers may be more likely than fathers to tolerate punitive behaviors from their child.

Limitations

This sample was drawn from a low-risk normative population, which generally presents low levels of externalizing behaviors. This precluded the analysis of the link between externalizing behaviors and punitive attachment in boys. The results may not be generalizable to a wider population of at-risk families. For example, it is possible that girls in at-risk populations present more varied levels of externalizing behaviors, which may allow to identify if some attachment types are also risky for girls. Future research should consider whether different preschool attachment types predict externalizing behaviors in boys and in girls. In addition, the sample size was relatively small, especially for boys (n = 61). Our sample size may have limited our ability to detect significant effects. The attrition from Time 1 to Time 2 also forced the use of

statistical methods to account for missing data. Although such methods are adequate under these circumstances, participants would have ideally completed all measures at both time points of the study. Lastly, this study did not have access to reports of external observers such as teachers. Teacher reports may be informative given that both parents interact with their child in a similar context, while teachers witness children's behaviors in a school context. That said, mothers and teachers tend to agree on their evaluation of children's externalizing behaviors (Moss et al., 2006).

Conclusion

This study investigated whether different preschool attachment types predicted externalizing behaviors in middle childhood boys and girls using a newly validated continuous measure of preschool attachment, the PARS. Results showed that child-father attachment security is a protective factor in the development of externalizing behaviors for boys. Child-father ambivalence in boys and child-father controlling-punitive attachment in girls are risk factors for the development of externalizing behaviors, but only when child-mother attachment of the same type is at medium or high levels. Child-father behavioral disorganization is a risk factor for the development of externalizing behaviors in boys. In girls, behavioral disorganization to both parents predicted fewer externalizing behaviors. The results thus indicate important differences between attachment types that are frequently aggregated (e.g., avoidance and ambivalence into an insecure-organized group, or controlling-caregiving and controlling-punitive into a controlling group) for statistical purposes. Similarly, results diverge in considerable ways between boys and girls, especially for behavioral disorganization. The PARS and other continuous measures of attachment can explain the subtle mechanisms by which different types of child-father and child-mother attachment may promote maladaptation in children.

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Tables & Figures

Table 3.1

Descriptive Statistics for Study Variables

	Boys (n = 61)			Girls (n = 83)			Test of difference[a]
Variables	Mean	*SD*	Range	Mean	*SD*	Range	
Child-mother attachment							
Security	5.65	1.68	1–8	5.28	1.97	1–8.5	t = 1.19
Avoidance	2.08	1.19	1–6	1.93	1.21	1–6	t = 0.76
Ambivalence	2.63	1.57	1–7	2.81	1.77	1–8	t = -0.64
Behav. disorganization	1.90	1.77	1–8	1.90	1.72	1–8	t = -0.01
Controlling-caregiving	2.36	1.63	1–8	3.00	1.85	1–8	t = -2.15*
Controlling-punitive	1.24	0.73	1–5	1.34	0.97	1–8	t = -0.71
Child-father attachment							
Security	5.07	2.03	2–9	5.36	1.8	1–8	t = -0.90
Avoidance	2.63	1.6	1–7	2.39	1.31	1–7	t = 0.98
Ambivalence	3.04	1.79	1–7	2.58	1.71	1–7.5	t = 1.58
Beh. disorganization	2.22	2.09	1–7	1.46	1.03	1–7	t = 2.88**
Controlling-caregiving	2.18	1.47	1–8	2.83	1.93	1–8	t = -2.18*
Controlling-punitive	1.27	0.78	1–5.5	1.29	0.76	1–5	t = -0.14
Externalizing behaviors	6.80	3.78	0.5–15.5	4.77	2.6	0–12	t = 3.15**

Note. [a] t-test comparing means across boys and girls. Beh. = behavioral, *SD* = Standard Deviation.
* $p < .05$, ** $p < .01$

Table 3.2

Bivariate Correlations Between Study Variables with the FIML Estimator

	Boys (n = 61)			Girls (n = 83)		
Variables	Child age	Family income	Externalizing behaviors	Child age	Family income	Externalizing behaviors
Child-mother attachment						
Security	.266*	-.015	-.175	.016	.162	-.121
Avoidance	-.002	-.142	-.079	-.011	.135	-.074
Ambivalence	-.233^{t}	.111	.137	-.152	-.021	.115
Behav.-disorganization	-.213^{t}	-.056	.201	.066	-.163	-.183^{t}
Controlling-caregiving	.011	.116	.156	.243*	-.173	.047
Controlling-punitive	-.054	-.106	-.159	.131	-.269*	.289**
Child-father attachment						
Security	.159	.047	-.357**	-.024	.163	-.100
Avoidance	-.012	-.101	.000	.228*	.039	.041
Ambivalence	-.091	-.080	.305*	-.258*	-.094	.101
Beh.-disorganization	-.118	-.155	.142	-.122	.076	-.209^{t}
Controlling-caregiving	-.076	-.083	-.017	.124	-.144	-.116
Controlling-punitive	-.098	.064	.117	.025	-.135	.103
Externalizing behaviors	.18	-.387**	-	-.116	.014	-

Note. Child age and family income at Time 1 are used in the correlations with child-mother and child-father attachment. Child age and family income at Time 2 are used in the correlations with externalizing behaviors.

^{t} $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

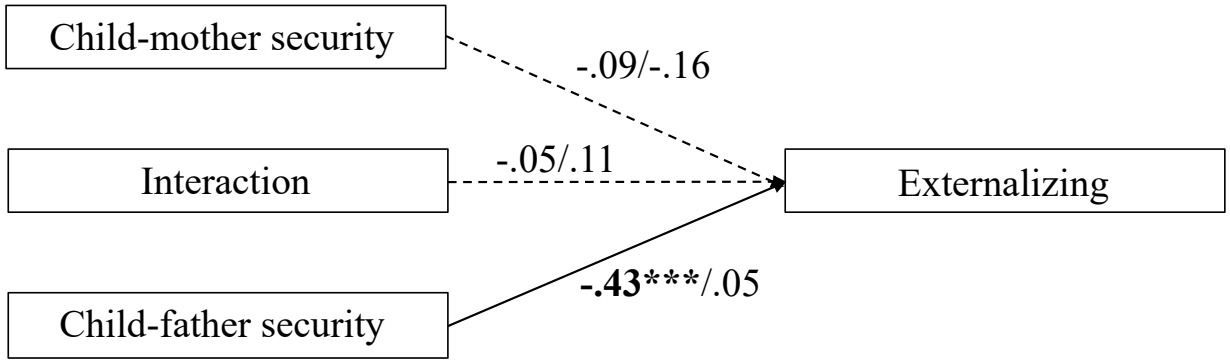

Figure 3.1

Child-mother and child-father security as predictors of externalizing behaviors. Estimates of the multi-group models are presented as follows: Boys (n = 61)/Girls (n = 83).

*** $p < .001$

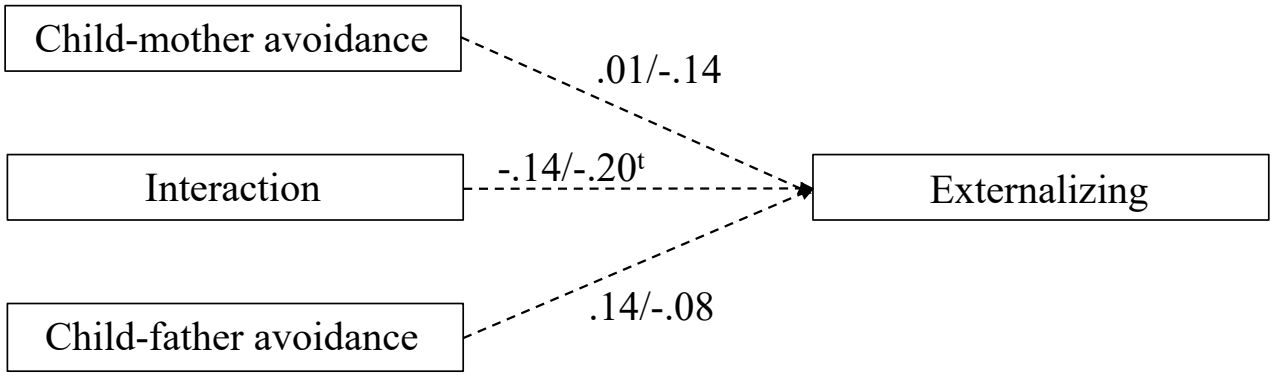

Figure 3.2

Child-mother and child-father avoidance as predictors of externalizing behaviors. Estimates of the multi-group models are presented as follows: Boys (n = 61)/Girls (n = 83).

^{t} $p < .10$

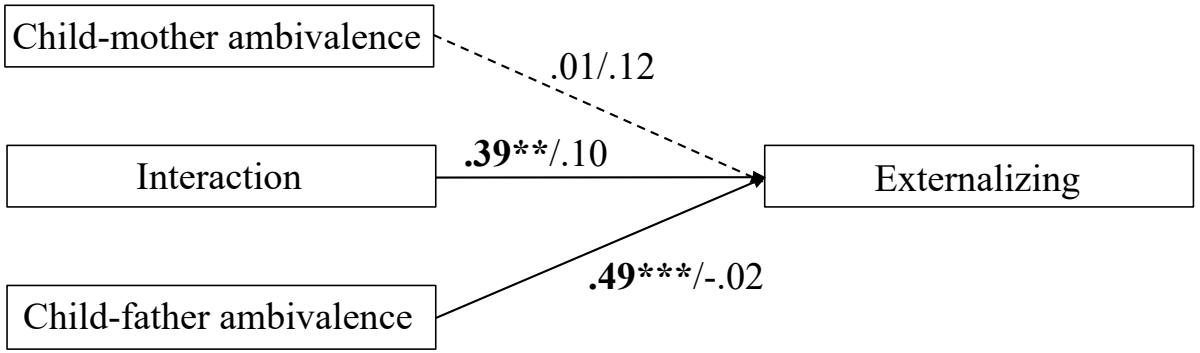

Figure 3.3

Child-mother and child-father ambivalence as predictors of externalizing behaviors. Estimates of the multi-group models are presented as follows: Boys (n = 61)/Girls (n = 83).

** $p < .01$, *** $p < .001$

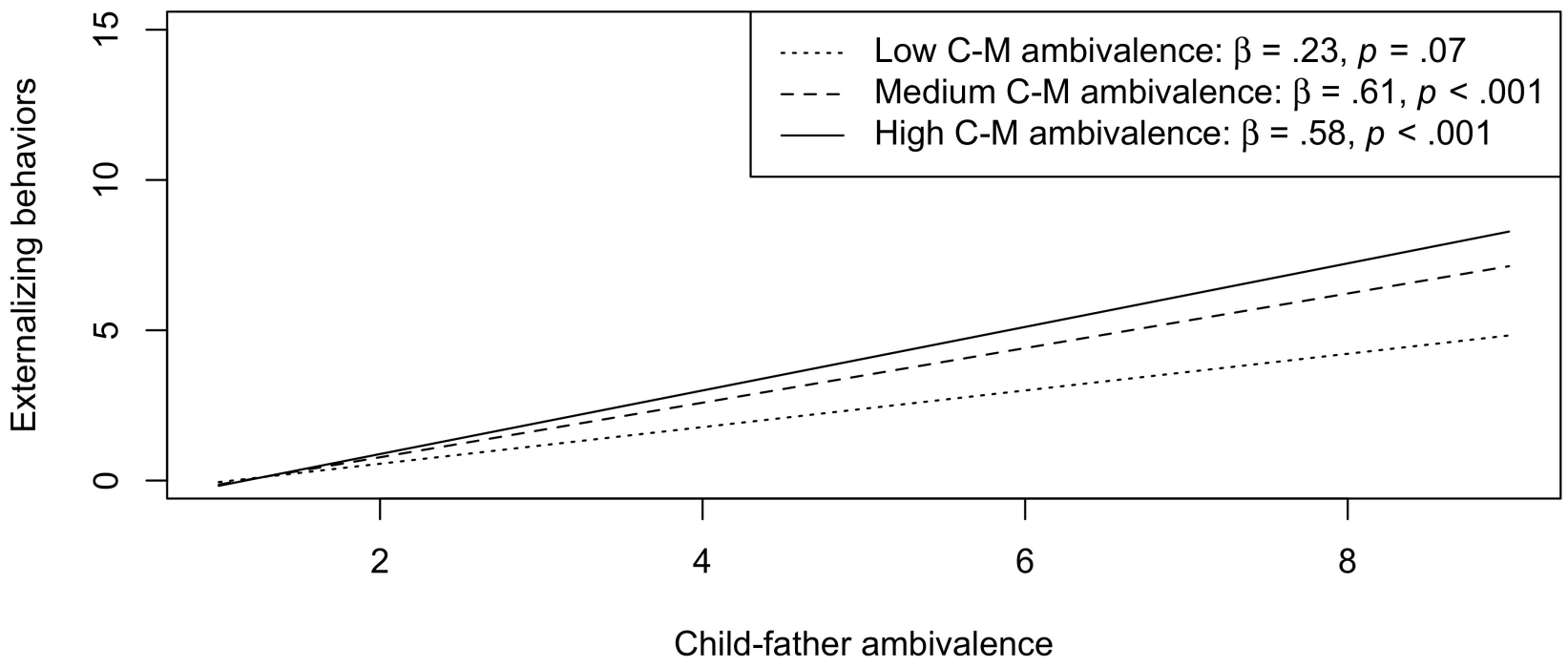

Figure 3.4

Simple slopes for the ambivalence interaction (n = 61). Child-father ambivalence is the predictor of boys' externalizing behaviors at three levels of child-mother ambivalence. The graphical depiction relies on untransformed values for ease of interpretation, statistical values rely on transformed values.

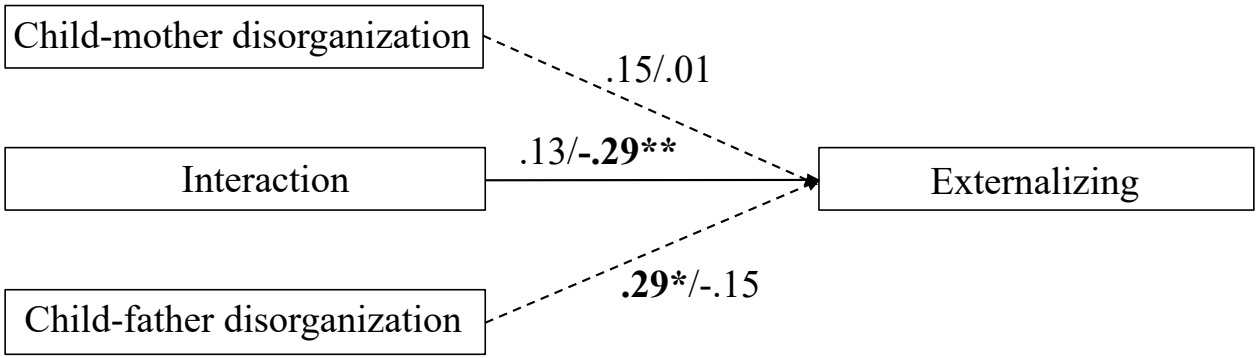

Figure 3.5

Child-mother and child-father behavioral disorganization as predictors of externalizing behaviors. Estimates of the multi-group models are presented as follows: Boys (n = 61)/Girls (n = 83).

* $p < .05$, *** $p < .001$

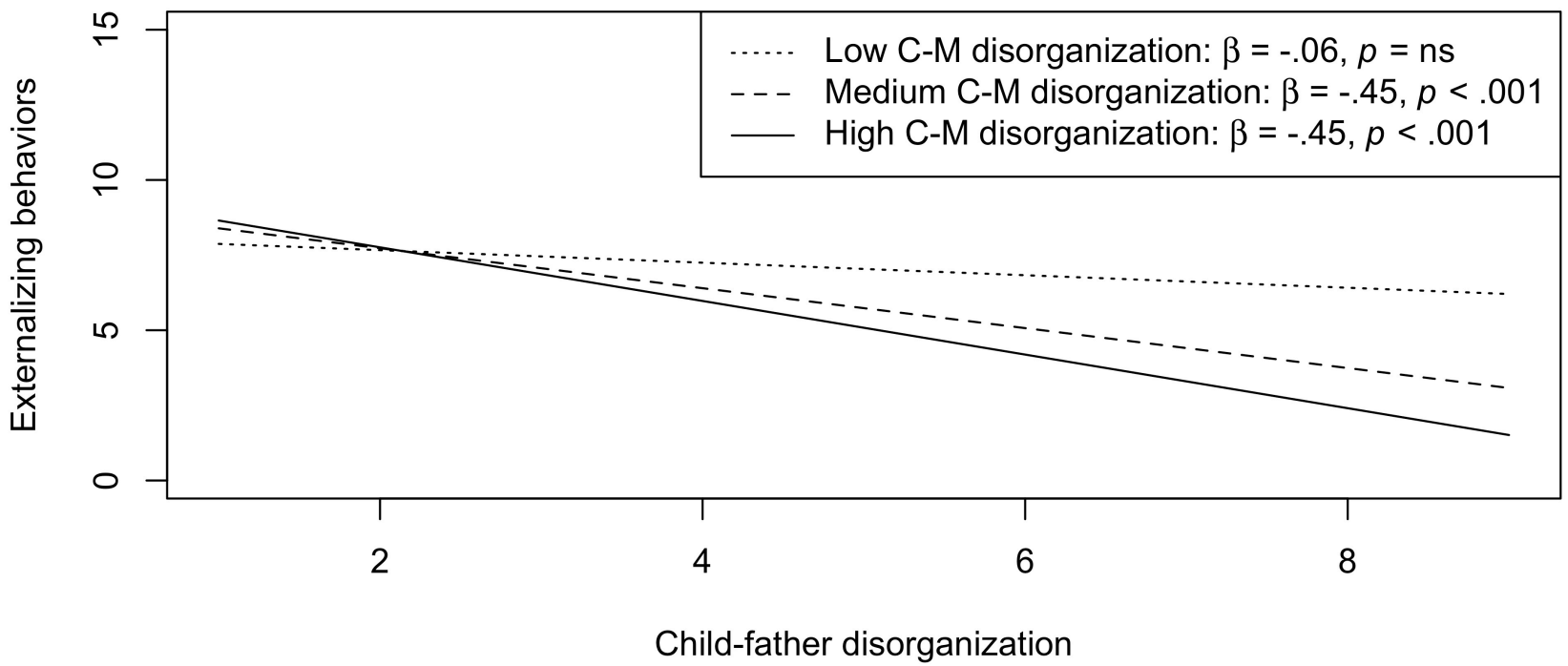

Figure 3.6

Simple slopes for the behavioral disorganization interaction (n = 83). Child-father behavioral disorganization is the predictor of girls' externalizing behaviors at three levels of child-mother behavioral disorganization. The graphical depiction relies on untransformed values for ease of interpretation, statistical values rely on transformed values.

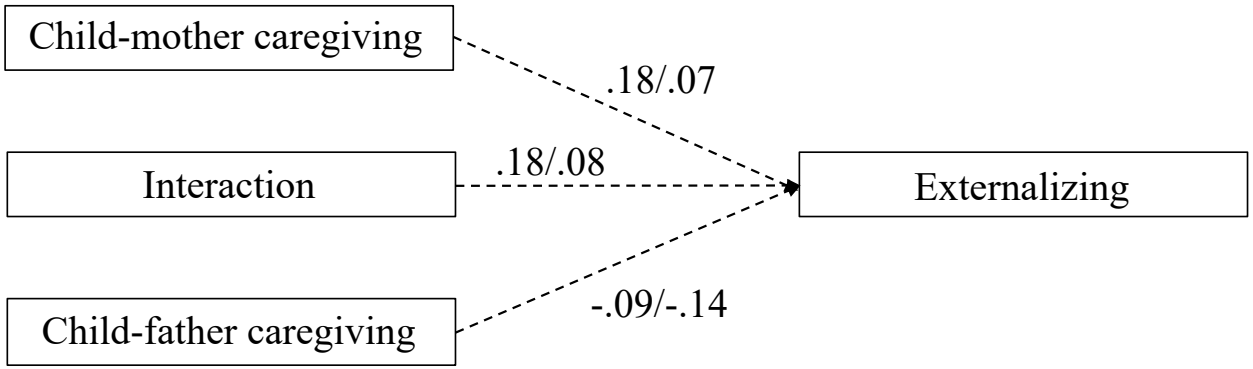

Figure 3.7

Child-mother and child-father controlling-caregiving attachment as predictors of externalizing behaviors. Estimates of the multi-group models are presented as follows: Boys (n = 61)/Girls (n = 83).

* $p < .05$, *** $p < .001$

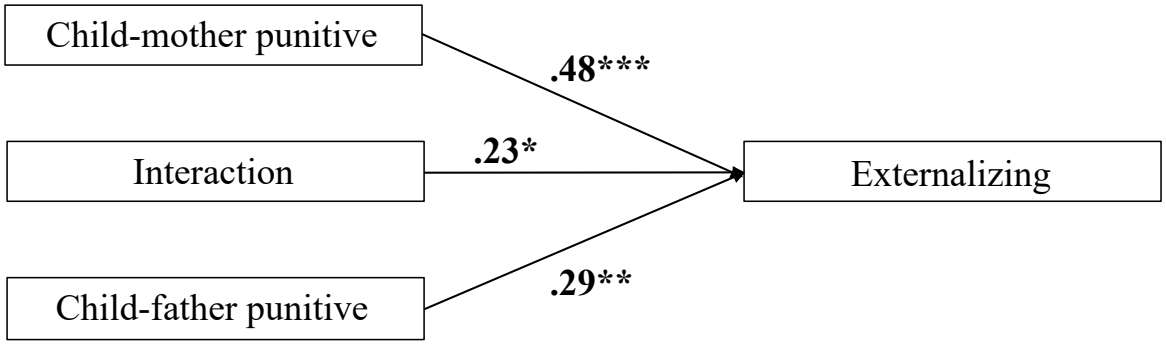

Figure 3.8

Child-mother and child-father controlling-punitive attachment as predictors of externalizing behaviors. Estimates are only presented for girls (n = 83).

* $p < .05$, ** $p < .001$, *** $p < .001$

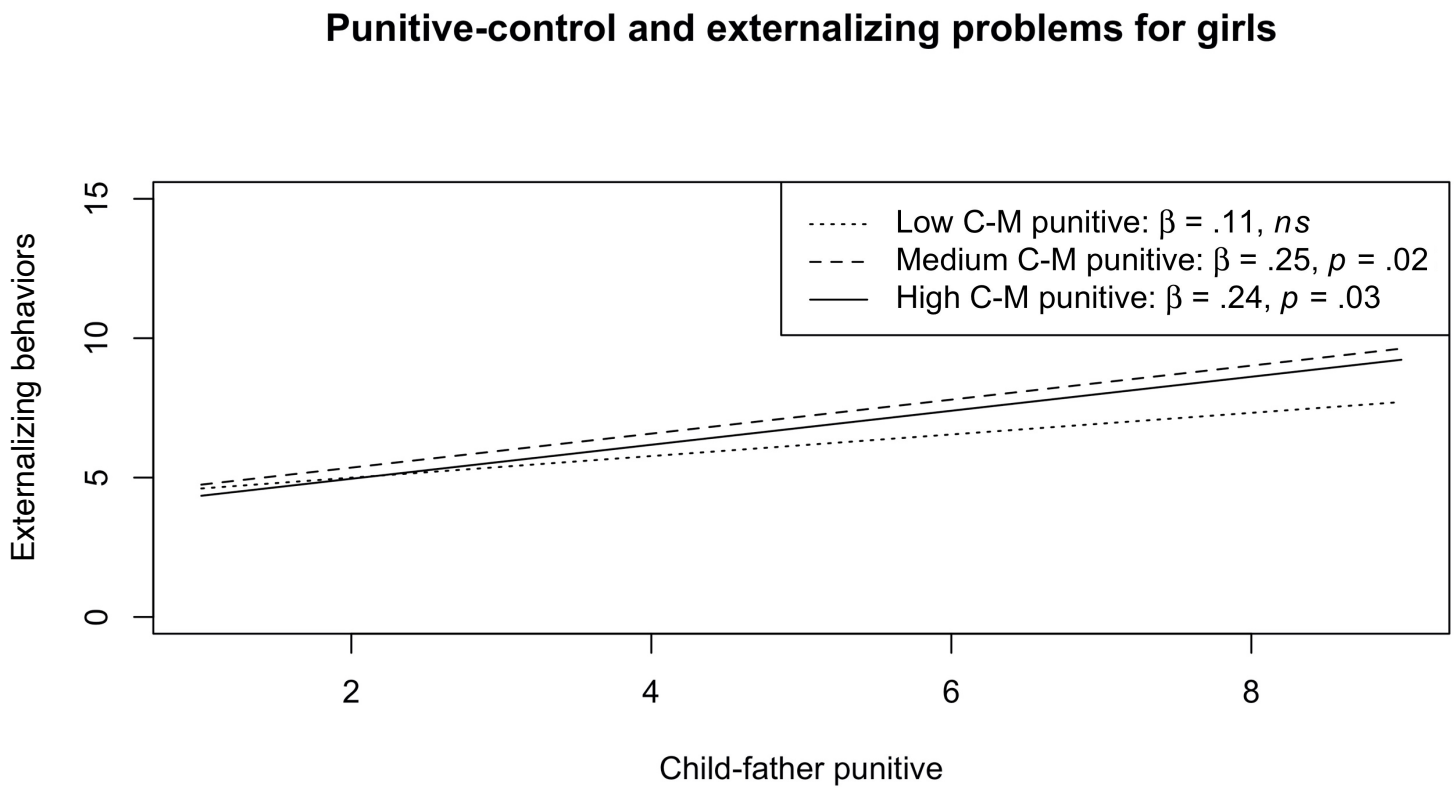

Figure 3.9

Simple slopes for the controlling-punitive interaction (n = 83). Child-father attachment is the predictor of girls' externalizing behaviors at three levels of child-mother controlling-punitive scores. The graphical depiction relies on untransformed values for ease of interpretation, statistical values rely on transformed values.

CHAPTER 4 (General Discussion)

Bowlby's and Ainsworth's attachment theory initiated a now mature field of research, a field that is rich in breadth and depth. This field has sought to explain how children's early relationships to their caregivers produce a lasting influence that spans beyond the bounds of these relationships. In trying to achieve this goal, attachment theory has expanded its reach beyond the confines of infant-mother relationships, notably applying the theory to other caregivers and later developmental periods. In addition, scholars question the limitations of existing measures of attachment in the hope of attaining more precise and refined measures that allow to uncover individual differences in children's attachment and their developmental trajectory.

The present dissertation subscribes to recent efforts to extend attachment theory beyond its original confines to understand better how children's attachment relationships foster their social and emotional adaptation. More specifically, the dissertation contributes to the subfields of preschool attachment, child-father attachment, and continuous measures of attachment. The first study demonstrated the reliability and validity of the *Preschool Attachment Rating Scales* (PARS) to measure child-mother and child-father attachment in the preschool years. The second study relied on the advantages of the PARS with respect to statistical power and distinct scales for each attachment pattern to examine whether child-mother and child-father preschool attachment predict externalizing behaviors in middle childhood boys and girls. This second study also expanded upon current work through its reliance on a family systems framework that considers both independent and joint influences of each attachment relationship on child outcomes. This discussion summarizes the main findings of these two studies, as well as the implications, future directions, and limitations of the dissertation.

Summary of Main Findings

Study 1: Validation of the PARS

Inter-Rater Reliability. The results showed that the PARS possess good to excellent inter-rater reliability. The inter-rater reliability question was of primary concern to ensure that different coders interpret children's attachment behavior in the separation-reunion procedure in a similar manner. Inter-rater reliability was excellent for all scales, with the exception of the child-father controlling-punitive scale, which presented good reliability. These findings suggest that scores on attachment scales reflect children's attachment behaviors (Haynes et al., 2011). Moreover, the inter-rater reliability gives credence to the training process of the PARS to train new coders in noticing and accurately interpreting children's attachment behaviors (Nunnally & Bernstein, 1994). This is a promising result as more researchers seek training to apply the PARS to their samples.

Construct Validity. Three different indicators supported the construct validity of the PARS. These indicators showed that the PARS adequately capture the construct of preschool attachment, a critical step in the validation process (Nunnally & Bernstein, 1994). First, the results indicated that the inter-correlations between the six scales were consistent with past theoretical and empirical work. For example, child-mother and child-father security were negatively correlated with all insecure scales, and avoidance and ambivalence were negatively correlated. The results align with past research on infants in the large sample of the National Institute of Child Health and Human Development study of Early Child Care Research Network (Fraley & Spieker, 2003; McCartney et al., 2004). Since the publication of the first study, we replicated these results in two other samples, namely a sample of 207 child-mother Singaporean dyads (Deneault et al., 2021) and a sample of 149 child-mother Canadian dyads (O'Neill et al.,

2021). These results, along with their further replication, contribute to establishing the construct validity of each one of the PARS.

Second, the results revealed that the PARS presented adequate convergent validity with its categorical and more established counterpart, the *Preschool Attachment Coding System* (PACS). Convergent validity helps ensure that the PARS and the PACS measure the same construct (Nunnally & Bernstein, 1994). For example, children who were classified as secure presented higher security scores than other children, avoidant children presented higher avoidance scores than other children, and so forth. Two different teams of coders coded the PACS and the PARS to ensure the independence of the observations. The comparative approach between classifications and continuous scales is consistent with other convergent validity analyses in infant attachment (Fraley & Spieker, 2003).

Lastly, the PARS were associated with parental sensitivity, a key construct that ought to be related to new measures of attachment (Solomon & George, 2016). Establishing that the PARS is associated with individual differences in a key related construct is an important aspect of construct validity (Nunnally & Bernstein, 1994). Results indicated that child-mother security was positively correlated with maternal sensitivity, and child-father security was positively correlated with paternal sensitivity. These relations remained significant even after controlling for the other parent's sensitivity levels. These results are coherent with past meta-analyses on the subject (De Wolff & van IJzendoorn, 1997; Lucassen et al., 2011; O'Neill et al., 2021), thereby supporting the validity of the PARS.

Validity Across Caregivers. The results showed that the PARS can be used across multiple caregivers. Scholars emphasize that new attachment measures must be usable across multiple caregivers, and that the validation process should ensure this usability (G. L. Brown &

Aytuglu, 2020; Solomon & George, 2016). This study supports the use of the PARS with child-mother and child-father dyads. Child-mother and child-father security were moderately correlated. This is consistent with past research showing small (in infancy) to moderate correspondence (in the preschool years and middle childhood) in attachment security toward both parents (Bureau et al., 2017; George et al., 2010; van IJzendoorn & De Wolff, 1997). In addition, all insecure scales except for the controlling-punitive one, were positively correlated across parents. These findings demonstrate that the PARS are usable across multiple caregivers, and answer a need for validated measures of child-father attachment (G. L. Brown & Aytuglu, 2020).

Predictive Validity. The PARS hold adequate concurrent predictive validity, as they predict children's externalizing behaviors, which is a key external variable related to attachment (Solomon & George, 2016). Child-father attachment security predicted fewer concurrent externalizing behaviors, while child-father ambivalence and behavioral disorganization predicted more externalizing behaviors in children. These findings were consistent with past studies that included child-father attachment (e.g., Boldt et al., 2016; Bureau et al., 2017, 2020), and supported the validity of the PARS.

Incremental Validity. The results showed the incremental or comparable validity of the PARS compared to the PACS in relation to variables of interest. This validation step ensured that the PARS does not lead to the loss of information when predicting external variables (Haynes & Lench, 2003). In the prediction of parental sensitivity, child-mother and child-father security scales held incremental validity over the secure classification, while the child-mother ambivalence and child-father controlling-punitive scales also held incremental validity over their classification counterparts. The PARS and the PACS performed similarly in the prediction of

children's concurrent externalizing behaviors; neither instrument possessed incremental validity over the other. As a whole, Study 1 presented evidence across diverse indicators of reliability and validity to show that the PARS is a valid measure of child-mother and child-father attachment in preschool-aged children.

Study 2: Independent and Joint Influence of Preschool Attachment on Externalizing Behaviors in Middle Childhood

This study used a longitudinal design to examine whether preschool child-mother and child-father attachment predicted boys' and girls' externalizing behaviors in middle childhood. Three hypotheses were possible for each attachment scale: (a) child-mother and child-father attachment predict children's externalizing behaviors independently (independent hypothesis), (b) two highly secure attachments predict fewer externalizing behaviors while two highly insecure attachments predict more externalizing behaviors (additive hypothesis), and (c) one highly secure attachment buffers against the negative influence of one insecure attachment in the prediction of externalizing behaviors (buffering hypothesis).

Independent Hypothesis for Security. The results supported different hypotheses for different attachment scales, and the results varied based on children's gender. Child-father attachment security predicted fewer externalizing behaviors, but only for boys. This result supports an independent hypothesis for child-father attachment, which is consistent with past research (Bureau et al., 2017; Goffin et al., 2018). This study extends past research to show that preschool child-father attachment security continues to predict externalizing behaviors into later development periods, namely middle childhood, while also showing nuances in the gender effects.

Independent and Buffering Hypotheses for Ambivalence. Child-father ambivalence predicted more externalizing behaviors in boys through an independent effect and a buffering effect with child-mother ambivalence. The buffering effect showed that the influence of child-father ambivalence was stronger when child-mother ambivalence was at mean or high levels. This buffering effect is consistent with past results concerning infant resistance and behavior problems in middle childhood (Kochanska & Kim, 2013). The presence of an independent effect in addition to the buffering effect may suggest that child-father ambivalence takes on a particularly salient role for preschool-aged boys.

Independent Hypothesis for Behavioral Disorganization in Boys, Joint Effect for Behavioral Disorganization in Girls. The results for behavioral disorganization diverged based on children's gender. In boys, child-father behavioral disorganization predicted more externalizing behaviors through an independent effect, which is consistent with findings on infant disorganization and behavior problems in middle childhood (Kochanska & Kim, 2013). In girls, behavioral disorganization predicted externalizing behaviors through a joint effect. Child-father behavioral disorganization predicted *fewer* externalizing behaviors when child-mother behavioral disorganization was at mean or high levels. This effect, albeit counterintuitive with respect to theory, is in line with past meta-analytical findings showing the child-mother disorganized attachment in girls predicts fewer externalizing behaviors (Fearon et al., 2010). It does not, however, readily map onto the integrative hypothesis in terms of buffering and additive effects (Dagan & Sagi-Schwartz, 2018), given that the "double insecure" group presented fewer externalizing behaviors. This is a possibility that the model as it stands does not account for. Nonetheless, these results support the importance of considering children's genders when examining the association between child-parent attachment and externalizing behaviors.

Independent and Buffering Hypotheses for Controlling-Punitive Attachment. The controlling-punitive scale predicted more externalizing behaviors in girls through independent and joint effects. Estimates were not available in boys due to the lack of variability in their controlling-punitive scores. In girls, child-mother and child-father attachment independently predicted more externalizing behaviors. In addition, they exerted a buffering effect by which the effect was stronger when child-mother and child-father controlling-punitive scores were high. The results for child-mother attachment are consistent with past research (Moss, Cyr, et al., 2004; O'Connor et al., 2011). It is, however, not possible to compare the buffering effect to past work because this study is the first to examine the joint influence of child-mother and child-father controlling-punitive attachment.

No Association for Avoidance and Controlling-Caregiving. The avoidance and the controlling-caregiving scales were not predictive of externalizing behaviors, thereby failing to support any of the three hypotheses. Past research also shows that child-mother and child-father avoidance in infancy does not predict behavior problems in middle childhood (Kochanska & Kim, 2013). As was the case with controlling-punitive attachment, no past research (except Study 1) has examined the relation between child-father controlling-caregiving attachment and externalizing behaviors. Existing work on child-mother controlling-caregiving classification does, however, support the absence of an association with externalizing behaviors (O'Connor et al., 2011). It will be interesting in future research to examine whether avoidance and controlling-caregiving attachment in the preschool years predict other developmental outcomes such as peer relationships, internalizing behaviors, and prosocial behaviors.

Theoretical Implications and Future Directions

The broader goal of this dissertation was to contribute to areas of growth within attachment theory. These areas seek to expand the field beyond its original bounds to account for the complexity of human relationships and the multifaceted ways that they may shape children's development. In the context of this dissertation, the areas of growth included (a) attachment in later developmental periods, specifically during the preschool years; (b) attachment to caregivers other than mothers, specifically attachment to fathers; and (c) measures of attachment that extend beyond mere categories, specifically continuous measures of attachment. This section explores the implications of this dissertation for each of these areas of growth and suggests potential avenues for future research.

Preschool Attachment

The preschool years represent a meaningful developmental period in children. During this period, children develop important cognitive skills (e.g., theory of mind; Miller, 2012; language development; Conti-Ramsden & Durkin, 2012) and emotional skills (e.g., more developed inhibitory control and emotion-regulation skills; Carlson & Wang, 2007; Geeraerts et al., 2021). Even at the level of the brain, preschool-aged children's brains undergo some of their most significant anatomical and physiological changes (T. T. Brown & Jernigan, 2012). The daily lives of preschool children also change. They have more opportunities for social interactions outside of the immediate family setting and are developing a sense of autonomy. Taken together, these changes make for a child who may act differently than in infancy toward their caregivers, and for caregivers that may react differently toward their maturing child. These relational changes during the preschool years warrant the investigation of attachment in this particular developmental period.

Academic interest in preschool attachment is not novel, however, it still lags behind interest for infancy. In 1990, Mark Greenberg, Dante Cicchetti, and Mark Cummings edited a volume on preschool attachment, which included contributions from influential attachment scholars such as Ainsworth, Main, Cassidy, and Marvin. This volume, despite signaling interest in the topic of preschool attachment and presenting avenues for future research, was not followed with considerable growth in the area. There were, of course, developments since (e.g., the Moss studies, the NICHD study), but questions still remain as to the core aspects of preschool attachment, namely the correlates and outcomes associated with different preschool attachment patterns. The present dissertation helped advance knowledge in these areas through the use of the PARS.

Much of the past research on preschool attachment has relied on secure-insecure dichotomies, resulting in a lesser understanding of insecure attachments. In contrast, the two studies making up this dissertation benefitted from the continuous nature of the PARS and the individual scales to examine each attachment pattern individually. For example, this dissertation examined how each attachment pattern relates to concurrent and longitudinal externalizing behaviors. The first study also examined each pattern in relation to parental sensitivity. Even if some of the results are not novel to the broader field of attachment, they allow us to confirm or disconfirm postulates of infant attachment for preschool attachment. Beyond this latter goal of comparing infant attachment questions to preschool attachment, there is a need for future research to question the particularities of preschool attachment when devising new research questions. For example, how do the expanded social circles of children coexist with child-caregiver relationships? Many preschool-aged children interact with teachers or daycare workers during the day, people who may be warm, sensitive, and foster a secure child-teacher

relationship (Williford et al., 2016). There is, to this day, very little known on how child-teacher and child-caregiver influence one another (Bureau et al., 2019). Could a secure child-teacher relationship buffer against the effect of insecure child-caregiver relationships? Such research avenues allow to consider how different ecological systems in children's environment interact to influence their development (Bronfenbrenner, 1995).

This dissertation leaned into the particularities of preschool attachment through its inclusion of controlling-caregiving and controlling-punitive attachments, which remain understudied. Notably, the first study allowed for an empirically based understanding of the relations between controlling-caregiving, controlling-punitive, and behaviorally disorganized attachments. Through the inclusion of individual scales for each of these three disorganized subgroups, the PARS has the potential to illuminate some questions as to the origins of role-reversal in child-caregiver dyads, without having to recruit samples of 1,000 children to ensure sufficient statistical power. To provide an example of such studies, Lecompte and colleagues (2021) used the PARS to examine the DNA antecedents of controlling-caregiving and controlling-punitive attachment in a sample of 161 Canadian child-mother dyads. The study revealed that DNA methylation of the oxytocin receptor gene in children predicted lower controlling-caregiving scores, but not lower controlling-punitive scores. Children with high scores of controlling-caregiving had hypomethylation, which is to say a higher expression of oxytocin (Lecompte et al., 2021). These results are particularly interesting when considering that oxytocin is associated with empathy and parental behaviors. This study also exemplifies how the PARS may be combined with complex and intensive data collections to inform the understanding of attachment. This proves to be an important asset of the PARS as the field of

attachment moves to a social neuroscience approach in the study of human relations (see Long et al., 2020).

Another important direction for future research relates to the stability of preschool attachment to later developmental periods. Much of the research on attachment stability has examined the stability from infant attachment to the preschool years (see Opie et al., 2020). Much less work has examined the stability of preschool attachment to attachment in middle childhood, probably due to the lack of valid measures of attachment in middle childhood until very recently. In this period, children spend more time with their peers and teachers than their parents, and the functions of attachment are different from other developmental periods (Kerns & Brumariu, 2016). There are substantial variations in attachment across these years, variations that may perhaps be explained by antecedents such as preschool attachment. Recently, Brumariu and her colleagues (2018) validated a continuous measure of attachment in middle childhood, the *Middle Childhood Attachment Scales* (MCAS). The MCAS, similar to the PARS, include six scales for each of the attachment patterns. The use of measures such as the PARS and the MCAS allow to consider directly the stability of the scores on each attachment scale across time in a longitudinal study. This would allow for the first account of stability for disorganized subgroups across different developmental periods. Both the fields of preschool attachment and middle childhood attachment may benefit from such research inquiries.

Child-Father Attachment

In many families, fathers are attachment figures to their children just like mothers, however, the vast majority of research on child-caregiver attachment has focused on child-mother dyads. When fathers were first studied, it was often through a mere maternal report of the number of hours fathers spent with their children (see Cabrera et al., 2014; Fagan et al., 2014).

Nowadays, scholars give greater attention to the quality of fathers' parenting, and even to the quality of child-father attachment relationships. Nonetheless, the research on child-father attachment still lags behind that on child-mother attachment. Child-father attachment was the subject of considerable attention within the present dissertation, which allowed us to further the field of child-father attachment. For example, Study 1 put both child-mother and child-father attachment at the forefront of the validation process, thereby answering the need for attachment measures that are also validated with child-father dyads (G. L. Brown & Aytuglu, 2020). In Study 2, we considered fathers' independent and joint effects with child-mother attachment, thereby allowing for a thorough investigation of the ways that different child-father attachment patterns promote socioemotional adaptation.

An important contribution of this dissertation was the advancement of knowledge on child-father attachment disorganization. Most past research on child-father attachment used a secure-insecure dichotomy, likely due to the limited sample size and the ensuing lack of statistical power when using categorical measures of attachment. The dichotomy created a situation in which there is knowledge of correlates of insecure child-father attachment, but practically nothing on the correlates of child-father disorganization. This dearth of research also applied to preschool attachment and to the three disorganized subgroups (behaviorally disorganized, controlling-caregiving, and controlling-caregiving).

The current dissertation answered the need for research on child-father disorganization in two important ways. First, both studies investigated associations with all disorganized scales. This allowed us to uncover new knowledge, namely that child-father disorganization is associated with externalizing behaviors in children, and that child-father controlling-caregiving and controlling-punitive attachments are negatively associated with paternal sensitivity. These

findings lay the ground for future research in the area by revealing that attachment disorganization in fathers is also related to socioemotional adaptation. Second, the dissertation unlocks a validated measure of attachment that will allow other scholars to code behaviorally disorganized, controlling-caregiving, and controlling-punitive attachments in their own samples of child-father dyads. The increased statistical power of the PARS will allow scholars to investigate questions relate to these attachment patterns, even with smaller samples.

The fact that this dissertation is the first to examine child-father disorganized subgroups means that it represents an important catalyst for future research. An important line of inquiry will be the identification of precursors of behaviorally disorganized, controlling-caregiving, and controlling-punitive attachments. In child-mother dyads, these disorganized subgroups have different precursors. Maternal withdrawal in infancy predicts the formation of a controlling-caregiving attachment in middle childhood (Bureau et al., 2009). In contrast, markers of disrupted communication and a clinical referral for concern about the relationship in infancy predict the development of controlling-punitive and behaviorally disorganized attachments (Bureau et al., 2009). In child-father dyads, only two studies examined precursors of disorganization, but measured it during infancy. Both studies found that frightening-frightened behaviors and atypical behaviors at 6 or 8 months did not predict child-father disorganized attachment at 12 or 15 months (Hazen et al., 2010; Madigan et al., 2011). These studies relied on a short-term longitudinal design and did not include an assessment of preschool attachment. It remains unclear if fathers' frightening-frightened behaviors and atypical behaviors may predict children's scores on the disorganized scales in the preschool years. If the results of the infancy studies were to be maintained in relation to preschool attachment, more questions would arise, such as the reasons why predictors of disorganization vary between mothers and fathers, and the

identification of other potential precursors of disorganization in fathers. These questions make it imperative to include child-father disorganization in future work aimed at uncovering the individual differences in disorganization.

Another contribution of this dissertation was its adoption of a family systems framework in the study of child-father attachment. This approach entailed not only considering child-father attachment, but also considering it within a larger system alongside child-mother attachment, as two coexisting relationships that influence one another and jointly influence the child. This framework enjoys support from notable scholars such as Philip Cowan, who pled for the application of such system for the study of child-father attachment back in 1997 (Cowan, 1997). Despite a few studies adopting a family systems approach in the following decades (e.g., Kochanska & Kim, 2013; Verschueren & Marcoen, 1999), Cowan's plea remained largely ignored, so much so that he felt compelled to reiterate it in the form of a special issue on child-father attachment (Cowan & Cowan, 2019).

This dissertation advances the family systems approach in the second study. In it, we examined the independent and joint effect of child-mother and child-father attachment on externalizing behaviors. Similar to the broader inclusion of child-father attachment in the dissertation, the contributions are not limited to the studies themselves. The PARS itself will prove useful for future studies adopting a family systems approach. Indeed, the continuous scales allow for the examination of the interaction between child-mother and child-father attachment even in a small sample. In a study outside of the current dissertation, our research group has used the PARS to examine the independent and joint effect of child-mother and child-father attachment on parents' coparenting relationship (Bureau et al., 2020). Without the PARS, this study would not be feasible, as the sample comprised too few children who presented insecure

attachments to both parents to have distinct groups of double secure attachments, double insecure attachments, and one secure/one insecure attachment. In addition, the PARS enabled the examination of the interaction between insecure scales, and not only make a secure-insecure comparison. Going forward, this will allow greater precision in identifying which attachment behaviors may be most influential, and potentially detrimental for development in children who exert these behaviors toward both parents. Much remains to be learned about the ways that having two specific insecure attachment patterns may influence child development, and the PARS represent a suitable measure to pursue research in this area.

Expanding the conceptualization of child-father attachment to draw in from other theories of fatherhood appears to be a fruitful direction for future research. In this dissertation, the application of the family systems framework allowed for a more ecologically valid representation of child development. Yet, the family systems framework is far from being the only relevant theory for child-father attachment and fathering research more broadly. For example, the developmental ecological systems framework would also add richness to the study of child-father attachment (Volling & Cabrera, 2019). This framework would allow to consider the chronosystem and the influence of life events on attachment relationships, or even the role of the macrosystem in shaping fathering practices (e.g., paternal leave policy may contribute to higher father involvement; Petts & Knoester, 2018; Wray, 2020) and thereby in influencing child-father attachment. Another interesting theory to consider is that of activation relationship theory (Paquette, 2004, 2020), which proposes that fathers' role may be especially important to open their children to the world. They may do so through activating behaviors such as physical or rough-and-tumbling play, challenging behaviors, etc. The role of such activating behaviors in

the development of a secure attachment relationship remains understudied, and further examination of this question may prove a worthy area of growth in the field.

Continuous Measures of Attachment

As we alluded to throughout the discussion, this dissertation made major contributions in the area of continuous measures of attachment. The first study provided evidence for the validity of a new, continuous measure of preschool attachment, a period for which continuous scales were unavailable. The PARS close the gap between continuous infant attachment measures and continuous middle childhood attachment measures. The PARS, like other continuous measures, do not make the process of coding attachment more burdensome in terms of time or complexity. New coders of preschool attachment are now trained on both the PACS and the PARS, thereby reducing any burden associated with the adoption of this continuous measure of attachment. In addition, coders typically code the category and the scales at the same time when coding their tapes. A number of coders even report that the PARS are instrumental when assigning a classification, as the PARS guide their coding of the PACS.

The PARS also unlock a wealth of information about children's attachment compared to categorical measures of attachment. The scales reveal the subtlety of children's attachment behaviors, which are rarely characterized by behaviors only indicative of a single attachment pattern. The PARS reflect the diversity of children's attachment relationships, both in terms of levels (e.g., 3, 5, 7 on a scale) and in terms of overlap across multiple scales (i.e., a 7 on security does not discard or overshadow a 3 on avoidance). This diversity is not reduced to a forced secure-insecure dichotomization resulting from low statistical power—the statistical power provided by the continuous nature of the scales allow for the study of each individual scale. The

PARS contribute to a more comprehensive study of attachment, one that dives into the subtleties of attachment patterns and their respective correlates.

A few studies already relied on the advantages of the PARS to study diverse samples for which it is very difficult to recruit a large number of participants. Such samples usually range from 30 to 50 participants, a number that limits analyses to secure-insecure comparisons with categorical measures, but not with the PARS. For example, Lecompte and colleagues (2018) recruited a sample of 33 South Asian immigrant and refugee mothers and examined the link between child-parent attachment scales and mothers' experiences as immigrants. They found that children with high ambivalence scores had mothers who reported fewer friends in the social circle. Children with high behavioral disorganization scores had mothers who reported less family support (Lecompte et al., 2018). Similarly, Delbarre and colleagues (2020) recruited a sample of 30 child-mother dyads who were consulting a child psychiatrist. They found that higher avoidant attachment was correlated with higher levels of maternal anxiety (Delbarre et al., 2020). The nuanced association between variables and specific insecure attachment scales in these studies exemplify the utility of applying the PARS to studies with a diverse sample.

An area for future research with respect to continuous measures of attachment is to compare their predictive power to attachment classifications. The first study did delve into such comparison for the purpose of incremental validity. However, a very large sample is needed to understand the systemic advantages of the categorical and continuous approaches (Duschinsky, 2020). Such a study has yet to be done, even for infant attachment. It seems like a next logical step, considering the trend toward individual-participant-data meta-analyses and pooling of existing samples to derive strong conclusions about child-caregiver attachment (see Verhage 2018, 2020). Another interesting possibility with large samples may be to use a latent profile

analysis to examine whether the configuration of scores on the scales is indicative of groupings of children. This may allow to uncover different precursors or characteristics of children in the groupings, even if these groupings do not map onto the typical classifications. For example, it is conceivable that children with a score of 6 on avoidance and 4 on security are grouped with children with scores of 6 on security and 4 on avoidance, even if these children are not within the same traditional attachment classification. Prior to extending research to these directions, there is a need for more studies to apply the PARS to their samples to have sufficient data for a pooled analysis examining the predictive power of attachment classifications and scales for different correlates and outcomes.

Clinical Implications and Future Directions

The dissertation also holds important clinical implications, particularly in the area of attachment-based interventions. Attachment-based interventions often rely on video-review sessions with a caregiver to alter the caregiver's internal working models and their parenting behaviors (Berlin et al., 2016). These interventions are important tools to promote child well-being and positive development according to clinicians, practitioners, and policymakers (Berlin et al., 2016). The success of a given intervention is often predicated upon a *classification change* from insecurity to security in children following the intervention. However, it may be unrealistic for a child who presents little to no secure behaviors to reach a secure attachment classification by the end of an intervention. In contrast, continuous measures such as the PARS register a *change in the level* of attachment behaviors. For example, the PARS is able to register a change an increase in security from a 1 to a 4, a reduction in behavioral disorganization from an 8 to a 5, and a reduction in avoidance from a 5 to a 2. Such changes do not translate into a classification change, despite representing important changes in the relative levels of security, avoidance, and

behavioral disorganization for the child. These changes are meaningful for a child-caregiver dyad and represent the foundations of future positive changes in the dyad. Reaching this level of precision in the description of attachment behaviors may thus benefit clinicians, practitioners, and welfare workers that are working alongside families.

The benefits of the PARS for attachment-based interventions are apparent from a study that applied the PARS in the context of the Circle of Security intervention (Huber et al., 2015). Participants were the caregivers (mostly females) of 55 children who were referred to a community mental health service due to concerns for (a) the child's behavioral difficulties, (b) the child's emotional difficulties, or (c) the child-parent relationship. At the end of the intervention, the classification changes toward security and away from behavioral disorganization were not significant. There were, however, significant scale changes in attachment security and behavioral disorganization. Children who were classified as insecure (n = 23) saw an increase of mean security level post-intervention. Similarly, children who were classified as behaviorally disorganized (n = 13) saw reductions in their behaviorally disorganized scale score; there were no differences for children who were not classified as behaviorally disorganized pre-intervention (Huber et al., 2015). This study provides preliminary evidence of the utility of the PARS in a clinical setting to understand the specific changes in child-parent attachment following an attachment-based intervention. Future research may expand the use of the PARS for clinical interventions other than the Circle of Security and to caregivers other than mothers.

Limitations

This dissertation contributed to the advancement of knowledge in the fields of preschool attachment, child-father attachment, and continuous measures of attachment; however, the

dissertation presents a number of limitations. First, the studies relied on a volunteer sample of parents, which may be especially problematic in the representativeness of fathers. Evidence shows that fathers who participate in research are more educated, have more stable marriages, have more progressive child-rearing beliefs, and provide a more optimal parenting environment than fathers who do not participate in research (Costigan & Cox, 2001). The dissertation sample may be composed of fathers who are more involved with their children than the average Canadian father, which may limit the generalizability of the findings to the broader population of fathers.

In addition, the sample was at low socioeconomic risk. The dissertation was thus unable to shed light on child-caregiver preschool children at higher levels of socioeconomic risk. It may be especially relevant to study externalizing behaviors in such samples given that attachment risk may be embedded within a larger risk model that also includes the child's characteristics, parenting practices, and family ecology (Greenberg et al., 1993). These risks could interact to increase exponentially the likelihood of maladaptation (Cicchetti, 2006). The sample was also primarily White, which limits the generalizability to diverse populations. It is important to replicate the core tenets of attachment theory and validation processes of attachment measures in diverse cultures (Mesman et al., 2016). Although this study does not meet this goal *per se*, the validation of the PARS provides the foundations for future studies of child-caregiver attachment in different cultures, such as the aforementioned study of child-mother attachment in Singaporean dyads (Deneault et al., 2021).

Lastly, the sample was relatively small and included missing data at the second time point. Some degree of missing data at the second time point, which took place approximately five years after the first one, is inevitable considering family relocations, changes in familial

situations, or disinterest. That said, it is worth noting that the sample size is in line with research in this area, especially among research that includes both mothers and fathers, and longitudinal research that includes a five-year time gap between time points. Nonetheless, research with larger samples is needed to replicate the findings with perhaps more diversity in attachment behaviors and in externalizing behaviors. Furthermore, a larger sample size may allow to compare the advantages of continuous measures of attachment over categorical ones (Duschinsky, 2020).

Conclusion

Attachment relationships are part of our everyday lives and influence many aspects of our social and emotional well-being. Current measures of attachment, mostly categorical in nature, contribute to a misconception of attachment in which individuals fall neatly into secure and insecure boxes. Individuals in the secure box are well-adjusted, and those in the insecure box are not. The 'secure attachment advantage' phenomenon, for instance, is commonly discussed and often misrepresented in the public discourse (see the debate between Meins, 2017 and van IJzendoorn et al., 2017). These arguments also extend to economic ones, showing that individuals with an insecure attachment cost more at a societal level through increased health, social, and economic support costs (Bachmann et al., 2019). The true story is much more complicated and cannot be summarized through a mere dichotomy. Inherent to continuous measures such as the PARS is the idea that human relationships are complex. Children form rich, deep, and meaningful bonds to their attachment figures, bonds which cannot be fully captured through mutually exclusive discreet categories. The PARS, along with other continuous measures of attachment, have the potential to reshape the rigid and static views of attachment in the research community and beyond. To that end, however, one can only be hopeful for

increased collaboration between attachment scholars and community partners (see Madigan, 2019), so that this emerging, more complete vision of attachment can transpire among practitioners, clinicians, welfare workers, and policy-makers.

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