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Child-father attachment in early childhood and behavior problems: A meta-analysis

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Abstract

This meta-analytic study examined the associations between child-father attachment in early childhood and children's externalizing and internalizing behavior problems. Based on 15 samples ($N = 1,304$ dyads), the association between child-father attachment insecurity and externalizing behaviors was significant and moderate in magnitude ($r = 0.18$, 95% CI: 0.10, 0.27 or $d = 0.37$, 95% CI: 0.20, 0.55). No moderators of this association were identified. Based on 12 samples ($N = 1,073$), the association between child-father attachment insecurity and internalizing behaviors was also significant, albeit smaller in magnitude ($r = 0.09$, 95% CI: 0.02, 0.15; or $d = 0.17$, 95% CI: 0.03, 0.31). Between-study heterogeneity was insufficient to consider moderators. When compared to the effect sizes of prior meta-analyses on child-mother attachment and behavior problems, the quality of the attachment relationship with fathers yields a similar magnitude of associations to children's externalizing and internalizing behaviors. Results support the need to consider the role of the attachment network, which notably includes attachment relationships to both fathers and mothers, to understand how attachment relationships contribute to child development.

KEYWORDS

child-father attachment, externalizing behaviors, internalizing behaviors, meta-analysis

1 | INTRODUCTION

Attachment theory proposes a framework to understand how relationships with caregivers in early childhood shape lifelong development (Bowlby, 1969/1982). A mature body of research shows that children's secure attachment relationships with the parent (hereafter referred to as child-parent attachment) promotes adaptation across diverse developmental outcomes, and that insecure attachment relationships are risk factors in the development of maladaptation (e.g., Badovinac et al., 2021; Cassidy & Shaver, 2016; Groh et al., 2017; O'Connor et al., 2011; Sroufe et al., 2010; van IJzendoorn et al., 1999). Much of this work has centered on child-mother attachment, as exemplified by a series of quantitative reviews. The meta-analyses have shown that child-mother attachment insecurity assessed in the early life course is associated with children's externalizing (Fearon et al., 2010) and internalizing (Groh et al., 2012; Madigan et al., 2013) behavior problems. Less is known, however, on how other attachment relationships within children's attachment networks may contribute to the development of behavior problems. For example, due to the scarcity of child-father studies, the meta-analyses published to date did not comprehensively examine the role of child-father attachment on children's behavior problems. Fortunately, research on child-father attachment insecurity and children's behavior problems has rapidly expanded over the last decade (e.g., Brown & Aytuglu, 2020; Schoppe-Sullivan & Fagan, 2020), thereby allowing for a meta-analytic synthesis of this body of research, which is the goal of the current study. Specifically, we (a) examine whether child-father attachment is associated with children's externalizing and internalizing behaviors at a meta-analytical level and (b) compare the magnitude of the derived meta-analytic associations with previous meta-analyses of child-mother attachment and behavior problems (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013).

1.1 | Theoretical considerations on the link between caregiver-child attachment and behavior problems

Attachment theory posits that experiences with caregivers in early childhood can shape the nature of children's attachment relationships (Ainsworth et al., 1978). For example, children who experience sensitive caregiving—defined as prompt, contingent, and appropriate responses to the child's needs and signals—are expected to form a secure attachment relationship to their caregiver. In contrast, children who experience insensitive caregiving, which may include delayed, inconsistent, inadequate, or absent responses to the child's needs, are at a higher risk of developing an insecure attachment relationship to their caregiver than children who experience sensitive caregiving (De Wolff & van IJzendoorn, 1997). These early attachment relationships are theorized to result in different developmental trajectories with respect to social and emotional development, including risk for psychopathology (e.g., DeKlyen & Greenberg, 2016; Groh et al., 2017).

Attachment research typically distinguishes between four patterns of child attachment, one being secure, and three being insecure, referred to as avoidant, resistant, and disorganized. Attachment behavioral patterns are distinguished during experimental paradigms such as the Strange Situation Procedure (SSP) (Ainsworth et al., 1978), during which the child is successively separated and reunited with their caregiver. Children classified as having a secure attachment are comforted by the caregiver, signal their distress directly and openly, and readily explore their environments within the proximity of the caregiver.

Children whose attachment with their caregiver is classified as insecure-avoidant show little distress related to separation from the caregiver, tend to ignore the caregiver in times of challenge, and explore their environment without reference to the caregiver. Children classified as having insecure-resistant attachment with their caregiver are often distressed upon separation from the caregiver and show difficulty settling down upon their return and/or resuming exploration (Ainsworth et al., 1978). Lastly, when under stress in the SSP, children with insecure-disorganized attachment with their caregiver exhibit a breakdown in an organized attachment strategy, indicated by highly conflicted, disoriented, or fearful behavior (Main & Hesse, 1990). Insecure attachment patterns (i.e., avoidant, resistant, and disorganized) are commonly grouped and compared against children with secure parent-child attachment.

Secure and insecure attachment relationships are expected to have lasting significance for children's developmental adjustment, including in regard to psychopathology (Bowlby, 1969/1982). Within the context of a secure attachment relationship, children can purportedly learn a wealth of social and emotional skills that foster positive adaptation. For example, it is hypothesized that children with secure attachments are more likely to learn how to freely express and discuss their emotions with the support and acceptance of their caregiver, which forms the basis of their adaptive emotion regulation skills (Fearon & Belsky, 2004; Thompson, 2016). Children with secure attachments are thus better equipped to cope with stressful situations in their environment and are less likely to develop maladaptive or dysregulating behaviors.

In contrast to secure attachment, children with an insecure attachment may not have been able to learn adaptive emotion regulation skills in the context of their attachment relationship, which increases their risk of developing maladaptive behaviors. For example, if their caregiver is rejecting or unresponsive, a child may develop expectations of others as unresponsive and rejecting and thereby treat others in an antagonistic matter (Cassidy & Kobak, 1988; Sroufe, 1983). Children with an insecure attachment may also be preoccupied with the caregiver at the expense of exploration, which may create a sense of dependency, social isolation, and regressed or immature behaviors (Moss et al., 1996). Without appropriate scaffolding from the parents, children with insecure attachments may not learn key emotion regulation skills that support their social relationships beyond the dyad.

1.2 | Empirical research on child-caregiver attachment and behavior problems

Children's behavior problems are often classified along two broadband dimensions: externalizing or internalizing behaviors (Achenbach & Rescorla, 2000). Externalizing behaviors are problematic behaviors that are directed outward, such as aggression, delinquency, and hyperactivity. Internalizing behaviors include problematic behaviors that are directed inward, such as depression, anxiety, somatic complaints, social isolation, and withdrawal (Liu, 2004). Considerable research effort in developmental and clinical science has been dedicated to uncovering the most potent factors that increase the risk of, and/or protect against, externalizing and internalizing behavior problems in children. Children's attachment relationships to their caregivers are believed to be one such factor.

A series of meta-analyses have confirmed an association between child-mother attachment insecurity and children's behavior problems (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013). The first meta-analysis addressed the association between child-mother attachment and externalizing behaviors across 69 studies representing a

cumulative sample of 5,947 children (Fearon et al., 2010). The meta-analysis revealed that insecure attachment was associated with higher levels of externalizing behaviors ($r = 0.15$ or $d = 0.31$). The latter two meta-analyses found small but statistically significant associations between insecure attachment and internalizing behaviors (Groh et al., 2012; Madigan et al., 2013). The effect sizes were noticeably smaller than those identified for externalizing behaviors and varied from $r = 0.08$ ($d = 0.15$; $k = 42$, $N = 4,614$; Groh et al., 2012) to $r = 0.18$ ($d = 0.37$; $k = 60$, $N = 5,236$; the effect size adjusted for publication bias was $r = 0.10$; $d = 0.19$; Madigan et al., 2013).¹ Taken together, previous meta-analyses on child-mother attachment provide evidence in support of attachment theory's central claim regarding the long-term repercussions of relationships in early childhood, as the magnitude of the associations did not decrease with age (Fearon et al., 2010; Groh et al., 2012).

1.3 | Child-father attachment relationships in the attachment network

An important limitation of the meta-analyses reviewed above, as noted explicitly by the authors, was the focus on child-mother attachment relationships due to the limited research on child-father dyads at the time. For decades, scholars have called for more studies considering the attachment network (e.g., Cowan, 1997; Cowan & Cowan, 2019; Dagan & Sagi-Schwartz, 2018). The composition of such a network may be quite diverse (with respect to the attachment figures involved and the number of relationships), but one of the ways that research has progressed is by considering the role of child-father attachment. That is, the field of developmental psychology can gain significant insights into child development by examining the child's relationship to both their mother and father (as well as to other significant caregivers). Although research on child-parent attachment continues to primarily focus on children's attachments to mothers, there is increasing research considering the developmental significance of children's attachments to fathers. The move to the study of attachment networks is driven by the notion that a child may develop unique attachment relationships with the mother and the father, and accordingly, each relationship may have its own impact on child development. To advance understanding of the attachment network, concerted attention should be paid to the role of the child-father relationship within this network.

Initial empirical research and quantitative reviews of attachment, and developmental science more broadly, have largely ignored the contributions of fathers and the quality of child-father attachment relationships to children's developmental trajectories (Brown & Aytuglu, 2020; Cabrera et al., 2000, 2014, 2018; Cowan, 1997; Cowan & Cowan, 2019). Indeed, Cassano et al. (2006) observed that in child psychopathology research, 1% of studies exclusively included fathers in research protocols, compared to 54% that exclusively included mothers (Cassano et al., 2006). The early focus on mothers in research may be explained by a reliance on a 20th century, mother-centric research model. Throughout much of the 20th century, mothers were the primary—and sometimes sole—caregivers involved in child-rearing. Fathers were considered husbands and breadwinners, rather than actively involved caregivers (Lamb, 2014). This societal belief informed research hypotheses; fathers' parenting behaviors and the quality of child-father relationships were not expected to have a direct impact on child development—they were consequently ignored, until recently.

The increase in research on fathers over the last several decades coincides with important societal trends. For example, women's increased participation in the workforce has transformed family roles and favored father involvement in child-rearing in many Western

countries (Bakermans-Kranenburg et al., 2019; Cabrera et al., 2000). This trend highlights how the mother-centric model no longer reflects the realities of most 21st century Western families, wherein both mothers and fathers may play an active role in child-rearing (Bakermans-Kranenburg et al., 2019; Cabrera et al., 2018). In many families, fathers act as co-parents (Cabrera et al., 2000; Pleck & Pleck, 1997) who participate in childcare and decision-making, and most importantly for the formation of child-father attachment, spend considerable time with their child (e.g., a 3- to 6-fold increase in father involvement has been observed in a recent generation of fathers; Bakermans-Kranenburg et al., 2019). A number of ensuing theoretical models on fathering and child-father relationships (e.g., Cabrera et al., 2007, 2014; Pleck, 2010; Volling & Cabrera, 2019), along with pleas for the inclusion of fathers in attachment research (e.g., Cowan, 1997; Cowan & Cowan, 2019; Fagan, 2020), have likely also contributed to burgeoning research on child-father attachment.

1.4 | The contribution of child-mother and father attachment to children's behavior problems

There is an ongoing debate regarding the relative contributions of child-mother and child-father relationships (as well as maternal and paternal parenting behaviors) to children's behavior problems, and to child development more broadly. There are three main views in this debate: (a) child-mother relationships are more important for all types of behavior problems, (b) child-father relationships are more important for specific types of behavior problems (i.e., externalizing behaviors), and (c) both relationships hold similar contributions for different types of behavior problems. On the one hand, it has been noted that developmental research has largely assumed that maternal behaviors and children's relationships with their mothers are more important contributors to child development than paternal behaviors and children's relationships with their fathers. This view partly stems from the long-held belief that fathers are secondary caregivers who spend little time with their children (see Cabrera et al., 2018). Accordingly, mothers, who act as the primary caregivers and spend more time interacting with their children, would hold a greater influence on their children's development. In support of this reasoning, much of the early work on attachment relationships and child outcomes failed to find an association between child-father attachment and children's behavior problems. For example, child-father attachment insecurity was not associated with maternal or paternal ratings of child externalizing and internalizing behaviors in a sample of 62 American children (Rothbaum et al., 1995); however, significant associations were observed for child-mother attachment and behavior problems. Lafrenière et al. (1992) documented a similar pattern of findings for internalizing problems in a sample of 83 Canadian children.

On the other hand, some scholars have proposed and demonstrated that father involvement, child-father relationships, and fathering behaviors are more potent predictors of certain developmental outcomes (such as externalizing problems) than child-mother relationships and maternal behaviors. For example, Paquette's (2004) activation theory proposes that fathers are more likely than mothers to excite and destabilize children, compete with children, and encourage children to take developmental risks (e.g., through physical and rough-and-tumble play). It is argued that in the context of insensitive interactions, fathers' activating and destabilizing behaviors could undermine the development of emotion regulation and social competence in children. Given that externalizing problems take place in social situations through outward-directive negative behaviors, fathers' behaviors and child-father relationships would be particularly relevant in the case of

externalizing behaviors. Empirical research has supported the unique role of paternal behaviors and child-father relationships in predicting externalizing problems and provided mixed findings when it comes to internalizing problems (Hennigar et al., 2020; Rodrigues et al., 2021). In the case of attachment research specifically, more contemporary research has provided evidence that insecure child-father attachment, in particular, may confer risk to children's externalizing behaviors. For example, studies by Kochanska and Kim (2013) and Bureau et al. (2020), on 86 American and 83 Canadian children, respectively, found that child-father attachment, but not child-mother attachment, was associated with children's externalizing behaviors.

Finally, a more integrative view suggests that with fathers' increasing levels of involvement, responsibility, and interaction with children, children's attachment relationships with their fathers and mothers contribute similarly to children's development (Fagan et al., 2014). This hypothesis has also been supported in research. For example, in a sample of 90 American children by Goffin et al. (2018), both child-mother and father attachment were associated with children's antisocial behaviors.

The inconsistent views and divergent findings regarding the relative contributions of child-father and mother relationships highlight the need for a meta-analysis that systematically examines whether the quality of children's attachment relationship with their father in early childhood is associated with behavior problems in children, and to compare the magnitude of the derived associations with effect sizes identified in meta-analyses on child-mother attachment (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013). In addition, the small sample sizes in individual studies highlight the need to combine studies through a meta-analysis to increase power and precision in testing these abovementioned hypotheses on the relative contribution of mothers and fathers to children's behavioral problems.

1.5 | Potential moderators of the association between child-father attachment and behavior problems

Meta-analyses on child-mother attachment and behavior problems have shown that methodological and sociodemographic characteristics may increase or attenuate the magnitude of the observed associations. In line with this work, the current study examines several potential moderators of the association between child-father attachment in early childhood and behavior problems. First, there are various measures to assess child-father attachment, including the SSP (Ainsworth et al., 1978), the Attachment Q-Sort (Waters, 1987), and the modified SSP (e.g., separation-reunion procedure; Cassidy and Marvin, 1992). As these measures are typically collected at different ages (from infancy to middle childhood), and in different contexts (i.e., home vs. laboratory), it is possible that association between attachment and behavior problems may vary as a function of the attachment measure used.

Second, children's age at the measurement of attachment and behavior problems may influence the strength of the association between child-father attachment and behavior problems. It has been shown that fathers become more involved in childcare during the preschool years (Black et al., 1999; Lamb, 2004), and this developmental period coincides with an increase in behavior problems among children (Tremblay, 2010). Third, child gender has been shown to play a role in the association between attachment and behavior problems. For example, child-mother attachment insecurity is more predictive of externalizing and internalizing behaviors in boys than in girls (Fearon et al., 2010; Madigan et al., 2013). Finally, the publication year may serve as a proxy that can account for a

sociological change in father involvement in childcare over time. As father involvement rises (Bakermans-Kranenburg et al., 2019; Bianchi et al., 2006), it is possible that child-father attachment may hold a stronger association with behavior problems in more recent years.

1.6 | The current study

Responding to the noted need for meta-analyses on child-father attachment and child outcomes (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013) and the renewed research interest in the attachment network (Dagan & Sagi-Schwartz, 2018), the first aim of the current study is to synthesize the association between child-father insecure attachment in early childhood and children's externalizing and internalizing behavior problems and test for potential moderators of this association. We focus on comparisons between children with secure versus insecure attachment (i.e., grouped as avoidant, resistant, disorganized), specifically, given that research examining associations by each attachment pattern (e.g., secure vs. avoidant) in child-father research is very limited. Indeed, roughly half of the studies included in this study used the traditional or modified SSP that would allow insecure attachment patterns to be distinguished; however, among these, very few reported on separate insecure classifications ($n = 2$).

Consistent with Groh et al. (2017), a second aim of the current study was to compare the pooled effect sizes for the meta-analyses on child-father attachment and externalizing behaviors, and child-father attachment and internalizing behaviors, to examine if child-father attachment predicts both dimensions of behavior problems similarly or differentially. Finally, our third aim was to compare the magnitude of the pooled effect sizes for child-father attachment and behavior problems derived herein, to those of child-mother attachment derived in previous meta-analyses (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013) to compare if attachment relationships to fathers and mothers hold similar or differential predictive power on children's behavior problems. The results can inform the current debate as to the relative contribution of different relationships in children's attachment networks on their behavioral development.

2 | METHOD

2.1 | Search strategy

This meta-analysis was conducted following the recommendations and standards set by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009). Searches were conducted by a science librarian in PsycINFO, MEDLINE, EMBASE, Web of Science, and Dissertation Abstracts International for published and unpublished studies from 1946 to August 5, 2020. Database-specific headings and text word fields were searched for concepts of "strange situation," "q-sort," and "attachment" in children up to age 12, with truncation symbols used to capture variant endings and spellings (e.g., infant*). Synonymous terms were combined with the Boolean "OR," and the concepts were combined with the Boolean "AND." No language restrictions were applied.

A total of 24,980 non-duplicate abstracts/titles were reviewed for inclusion into the *Child Attachment Studies Catalogue and Data Exchange* (CASCADE; Madigan, 2020), a data repository consisting of extracted, compiled, and coded data from all studies that have observationally measured child-parent attachment. A total of 2,405 full-text articles were

reviewed for inclusion into CASCADE, which required the study to be (a) empirical; and (b) using one of the following observational coding measures of child-parent attachment: the SSP (Ainsworth et al., 1978), the modified SSP (Cassidy & Marvin, 1992; Main & Cassidy, 1988; Moss et al., 2015), the Attachment Q-Sort (Waters, 1987), and the Preschool Attachment Assessment (Crittenden, 1992). Data in CASCADE are cataloged on a variety of sample demographics, measurement, and outcome factors, creating ease in conducting conventional meta-analyses. From the CASCADE catalog, we selected all studies that met the two following criteria:

1. The study measured children's attachment with their fathers in early childhood using an observational measure of attachment. To retain consistency with our comparators, that is, meta-analyses on child-mother attachment and behavior problems (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013), we did not include representational measures (e.g., Attachment Story Completion Task; Bretherton et al., 1990), or questionnaire measures of attachment (e.g., the Security Scale; Kerns et al., 2001).
2. The study included an assessment of externalizing or internalizing behaviors. There was no restriction on this assessment: we included parent-, teacher-, or self-report, as well as direct observation conducted at any point in childhood. Consistent with the series of meta-analyses on child-mother attachment and behavior problems (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013), externalizing behaviors included aggression, oppositional problems, conduct problems, and hostility. Internalizing behaviors included anxiety, depression, withdrawal, and somatic complaints. One study that only provided the association for child-father attachment and total behavior problems was excluded. Measures of externalizing and internalizing behaviors can be found in Table 1.

A total of 22 full-text articles met initial inclusion criteria from CASCADE (see PRISMA diagram in Figure 1). Reference lists of relevant meta-analyses and articles identified in CASCADE were also screened for additional studies, and 13 potential studies were identified and full-text articles were reviewed. Five studies required further information to determine inclusion criteria. We contacted the authors of these studies, and three (60%) responded with the requested information. Further, publications with overlapping data were identified for two samples across seven publications (sample 1: Bureau et al., 2017, 2020; Deneault et al., 2020; sample 2: Boldt et al., 2017; Goffin et al., 2018; Kim et al., 2014; Kochanska & Kim, 2012, 2013). To ensure each sample was only represented once, we selected the publication with the largest sample size and most complete effect size information (externalizing behaviors: Boldt et al., 2017 and Deneault et al., 2020; internalizing behaviors: Bureau et al., 2017 and Kochanska & Kim, 2013).

After applying all the above-mentioned criteria, a total of 18 full-text articles met the full-text inclusion criteria and were included in the meta-analysis. The meta-analysis on child-father attachment insecurity and externalizing behaviors included 15 studies, while the meta-analysis on child-father attachment insecurity and internalizing behaviors included 12 studies.

2.2 | Data extraction

Several moderator variables were extracted from individual studies: (a) attachment measure; (b) child age (in months) at both the attachment and outcome assessments; (c) percentage of male children in the sample; and (d) publication year. The first author was the

TABLE 1 Sample characteristics for studies included in the meta-analyses

Study	N	Country	% Male	% White	Attachment measure	Age at attachment assessment ^a	Informant of ext./int.	Ext. measure	Age at ext. assessment ^a	Int. measure	Age at int. assessment ^a
Aviezer et al. (2002)	66	Israel	50	–	SSP	14	Teacher	Unspecified questionnaire	133	–	–
Boldt et al. (2017)	82	USA	50	84	SSP	15	Father	Child Symptom Inventory-4, Adolescent Symptom Inventory-4	120, 144	–	–
Bureau et al. (2017)	107	Canada	–	–	SSP-M	47	Mother & Father	–	–	SDQ	47
Colonnese et al. (2013)	20	the Netherlands	35	–	AQS	46	Father	SDQ	46	SDQ	46
DeKlyen et al. (1998)	105	USA	100	86	SSP-M	57	Mother, Father, & Teacher	CBCL	57	–	–
Deneault et al. (2020)	144	Canada	42	85	SSP-M	47	Mother & Father	SDQ	47	–	–
Dumont and Paquette (2013)	53	Canada	38	81	SSP	15	Father	SCBES	35	SCBES	35
Feugé et al. (2020)	68	Canada	67	93	AQS	47	Father	CBCL	47	CBCL	47
George (2010)	235	USA	45	77	SSP-M	72	Teacher	CBCL	72, 96	CBCL	72, 96

(Continues)

TABLE 1 (Continued)

Study	N	Country	% Male	% White	Attachment measure	Age at attachment assessment ^a	Informant of ext./int.	Ext. measure	Age at ext. assessment ^a	Int. measure	Age at int. assessment ^a
Kochanska and Kim (2013)	86	USA	53	84	SSP	15	Mother, Father, & Teacher	–	–	Child Symptom Inventory-4	78, 96
Lafrenière et al. (1992)	83	Canada	49	–	AQS	45	Teacher	–	–	Preschool Behavior Questionnaire	45
Lindsey et al. (2009)	80	USA	48	76	SSP	18	Observer	Observation	36	–	–
McElwain and Volling (2004)	30	USA	50	–	SSP	12	Observer	Observation	51	–	–
Monteiro et al. (2008)	56	Portugal	48	–	AQS	32	Mother & Father	SCBES	32	SCBES	32
Rothbaum et al. (1995)	32	USA	50	100	SSP	22	Mother, Father, & Teacher	CBCL	84	CBCL	84
Suess et al. (1992)	39	Germany	46	–	SSP	18	Observer	Minnesota Preschool Affect Checklist	60	Minnesota Preschool Affect Checklist	60
Tirkkonen et al. (2016)	69	Finland	48	98	PAA	18	Father	CBCL	48	CBCL	48
Volling et al. (2014)	225	USA	46	86	AQS	31	Mother & Father	CBCL	31	CBCL	31

Abbreviations: AQS, attachment Q-Sort; CBCL, Child Behavior Checklist; Ext., externalizing problems; Int., internalizing problems; PAA, Preschool Attachment Assessment; SCBES, Social Competence and Behavior Evaluation Scale; SDQ, Strengths and Difficulties Questionnaire; SSP, Strange Situation Procedure; SSP-M, Strange Situation Procedure Modified.

^aAge in months.

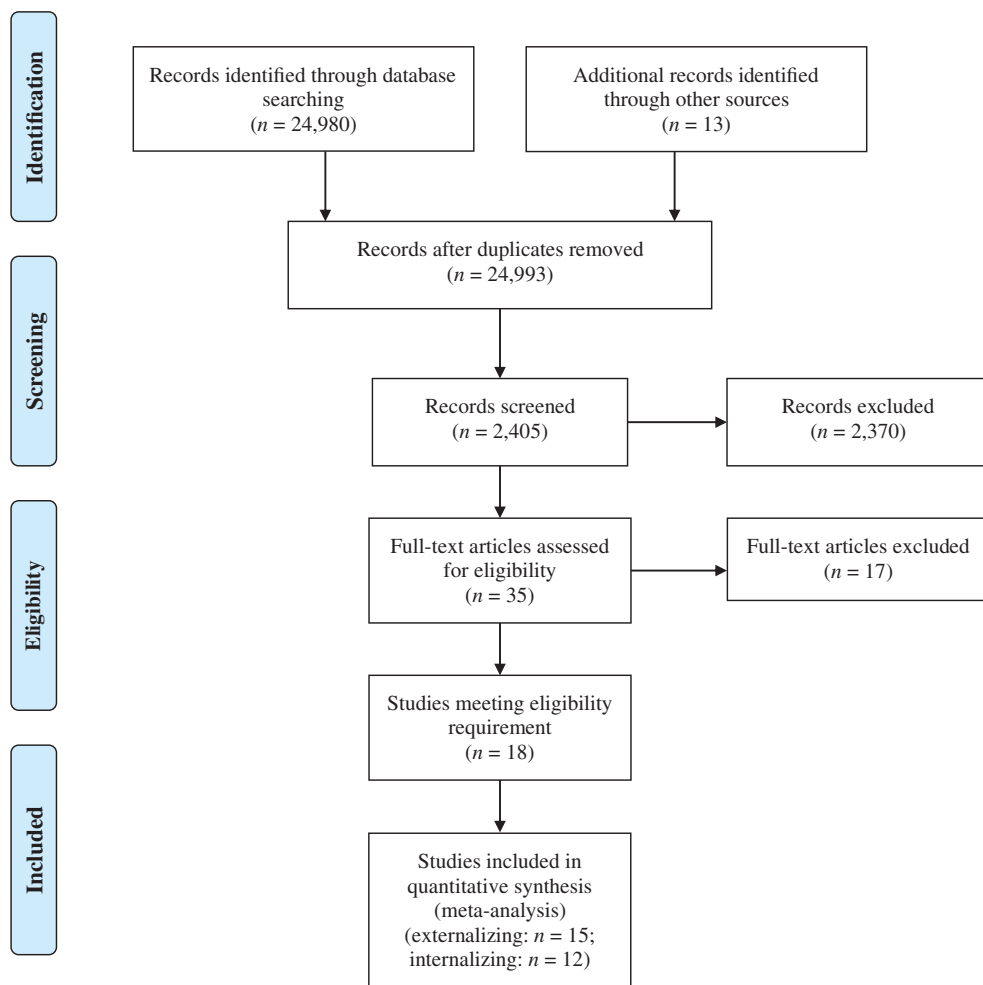


FIGURE 1 Prisma flow diagram of study selection

primary coder for these studies. Reliability with a second coder on 28% of included studies ranged from 0.80 to 1.00 for continuous variables and was 100% for the categorical moderator.

2.3 | Data analysis

The first author extracted effect sizes from studies, including correlation coefficients, regression coefficients, F -values, and means/standard deviations. Two studies reported non-significant findings without specifying the effect size. For these studies, following recommendations by Rosenthal (1995), we computed an effect size based on a two-sided p -value of 0.50. We conducted all transformations across effect sizes using the R package *compute.es* (Del Re, 2013). Some studies provided more than one effect size. For example, instead of reporting the association between attachment and a total externalizing score, they reported the link between attachment and conduct problems as well as attachment and hyperactivity/inattention. In such cases, we used the R package *metafor* (Viechtbauer,

2010) to pool the effect sizes such that the meta-analysis only included one effect size per study.

We used the R package *metafor* (Vietchtbauer, 2010) to conduct the meta-analyses. Pooled effect sizes are presented as Pearson's correlations (r), with 95% confidence intervals (CI's) given that the majority of included studies provided this effect size format in their studies. Pearson's correlations are considered small, medium, and large, based on values of 0.10, 0.20, and 0.30, respectively, according to newly calibrated effect size guidelines for psychological research provided by Funder and Ozer (2019). Prior to the analyses, correlations were converted to a Fischer's z because of the large variability of the variance depending on the magnitude of the correlation (Borenstein & Hedges, 2019). We also presented the meta-analytic effects as standard Pearson's correlations and Cohen's d for ease of interpretation and comparison with the child-mother attachment meta-analyses. We examined the presence of publication bias with the Egger test and examination of the funnel plots. We assessed heterogeneity using the Q and I^2 statistics. Consistent with recommendations by Borenstein (2009), we examined moderators if the Q statistic was significant or if the I^2 was greater than 50%.

To compare the effect sizes of child-father attachment with externalizing and internalizing behaviors, we used the *robumeta* package (Tanner-Smith & Tipton, 2014), which allowed for a multilevel approach to compare dependent effect sizes. We compared results of the child-father attachment meta-analyses to the effect sizes of the child-mother attachment meta-analyses through the comparison of 85% confidence intervals (CI; Goldstein & Healy, 1995). This approach is a conservative significance test for the comparison of overlapping studies across meta-analyses (e.g., if one study was included in the child-father and mother meta-analyses). A difference between effect sizes is identified if the 85% confidence intervals do not overlap. To remain consistent with the meta-analyses on child-mother attachment and behavior problems, which reported effect sizes in Cohen's d , comparisons for these analyses are presented using Cohen's d .

3 | RESULTS

3.1 | Child-father attachment and externalizing behaviors

3.1.1 | Summary of study variables

Fifteen studies reported on the association between child-father attachment security/insecurity in early childhood and externalizing behaviors. The median sample size was 68, with a range of 20–235 participants. The socioeconomic background of all samples was either mixed, middle class, or middle-upper class. Three samples contained an indicator of risk (20%): two included foster/adoptive children (Colonnesi et al., 2013; Feugé et al., 2020), and one included children with a diagnosis of oppositional defiant disorder (50% of the sample; DeKlyen et al., 1998). One sample included fathers in a homosexual relationship (7%; Feugé et al., 2020), while the remaining studies consisted of fathers in a heterosexual relationship.

With respect to the attachment measure used, seven used the SSP (47%), four studies used the Attachment Q-Sort (27%), three used a modified SSP (20%), and one used the Preschool Attachment Assessment (7%). Children were 31 months old on average when attachment was assessed, with a range of 12–72 months (median: 21.5 months). As for the externalizing assessment, six studies used the Child Behavior Checklist (40%), three used a direct observation method (20%), two used the Strengths and Difficulties Questionnaire (13%), two used the Social Competence and Behavior Evaluation Scale (13%), one used a

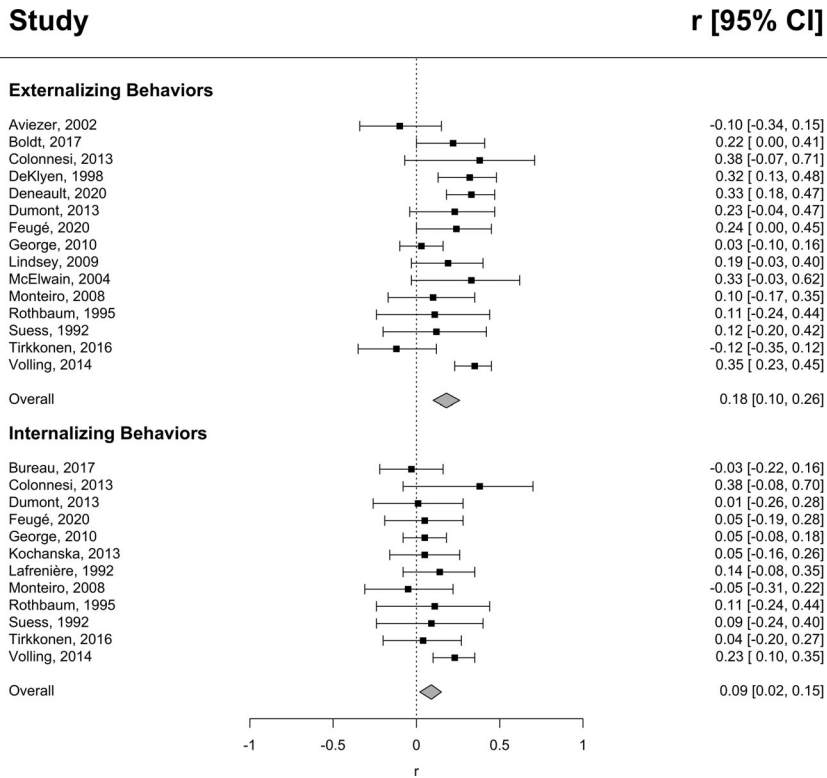


FIGURE 2 Forest plot of effect sizes for child-father attachment and child behavior problems

composite of the Child Symptom Inventory-4 and Adolescent Symptom Inventory-4 (7%), and one used an unspecified questionnaire (7%). The informants of externalizing problems were the father (33%), an observer (20%), or a teacher (13%), or composites of multiple informants (mother and father: 20%; father, mother, teacher: 13%). Children were 60 months on average at the time of the externalizing behavior assessment, with a range of 31–133 months (median: 48 months). Eight studies used a longitudinal design (53%), six studies used a cross-sectional design (40%), and one used a mixed design that included cross-sectional and longitudinal analyses (7%).

Almost all studies were published peer-reviewed articles (93%), while one was a doctoral dissertation. Publication year ranged from 1992–2020. In terms of geographical location, seven studies were conducted in the United States (47%), three in Canada (20%), and one in each of the following countries: Finland (7%), Germany (7%), Israel (7%), the Netherlands (7%), and Portugal (7%).

3.1.2 | Meta-analytic result for externalizing behaviors

A total of 15 studies (1,304 participants) were included in the random-effects meta-analysis model. As shown in Figure 2, this model showed a significant positive combined effect size of child-father attachment insecurity and children's externalizing behaviors: Fisher's $z = 0.19$ (95% CI: 0.10, 0.27), $p < 0.001$. This is equivalent to an effect size of $r = 0.18$ (95% CI: 0.10, 0.27), or $d = 0.37$, 95% CI: 0.20, 0.55, a moderate effect size. Child-father attachment insecurity is thus associated with more externalizing behaviors. The funnel plot did

TABLE 2 Results of the moderator analysis for the association between child-father attachment insecurity and externalizing behaviors

Externalizing behaviors					
Categorical moderators	<i>k</i>	<i>r</i>	95% CI	<i>Q_M</i>	<i>p</i>
Attachment measure ^a				5.08	0.17
Attachment Q-Sort	4	0.28	0.16, 0.42		
Strange Situation Procedure	7	0.15	0.04, 0.26		
Modified Strange Situation Procedure	3	0.22	0.02, 0.43		
Continuous moderators	<i>k</i>	<i>B</i>	95% CI	<i>Z</i>	<i>P</i>
Child age at attachment assessment	15	0.001	-0.004, 0.01	0.53	0.60
Child age at outcome assessment	15	-0.002	-0.01, 0.0004	-1.70	0.09
Child gender	15	0.002	-0.004, 0.01	0.67	0.50
Publication year	15	0.004	-0.01, 0.02	0.68	0.50

Abbreviations: b, estimate; CI, confidence interval; k, number of studies; *Q_M*, test of moderator; *r*, correlation coefficient.

^aThe Preschool Attachment Assessment was excluded from the analysis as there fewer than three studies the categories.

not reveal asymmetry, and the Egger test was not significant ($z = 0.10$, $p = 0.93$), suggesting that studies with small sample sizes did not present more extreme values. The *Q* statistic ($Q = 31.5$, $p = 0.005$) and the I^2 value ($I^2 = 54.09$) indicated the presence of heterogeneity between studies, thereby warranting exploration of moderators. As shown in Table 2, none of the moderators tested (i.e., attachment measure used, child age at the assessment of the attachment and outcome measure, child gender, and publication year) emerged as significant.

3.2 | Child-father attachment and internalizing behaviors

3.2.1 | Summary of study variables

Twelve studies reported on the association between child-father attachment security/insecurity in early childhood and internalizing behaviors. The median sample size was 68, with a range of 20–235 participants. The socioeconomic background of all samples was mixed, middle class, or middle-upper class. Two of the samples contained an indicator of risk because they studied foster/adoptive children (17%; Colonnese et al., 2013; Feugé et al., 2020). One sample included fathers in a homosexual relationship (8%; Feugé et al., 2020); the rest were in a heterosexual relationship.

With respect to the attachment measure used, five studies used the Attachment Q-Sort (42%), four used the SSP (33%), two used a modified SSP (17%), and one used the Preschool Attachment Assessment (8%). Children were 31 months old on average when attachment was assessed, with a range of 12–72 months (median: 21.5 months). As for the internalizing assessment, five studies used the Child Behavior Checklist (42%), two used the Strengths and Difficulties Questionnaire (17%), two used the Social Competence and Behavior Evaluation Scale (17%), one used the Child Symptom Inventory-4 (8%), one used the Preschool Behavior Questionnaire (8%), and one used a direct observation method (8%). The informants of internalizing problems were the father (33%), a teacher (17%), or an observer (8%), or composites of multiple informants (mother and father: 25%; father, mother, teacher: 17%). Children were 60 months on average at the internalizing behavior assessment, with a range of 31–133 months (median: 48 months). Eight studies relied on

a longitudinal design (53%), six studies on a cross-sectional design (40%), and one on a mixed design (7%).

Almost all studies were published peer-reviewed articles (92%); the other one was a doctoral dissertation. Publication year ranged from 1992–2020. Seven of the studies were conducted in the United States (58%), three in Canada (25%), and one in each of the following countries: Finland (8%), Germany (8%), Israel (8%), the Netherlands (8%), and Portugal (8%).

3.2.2 | Meta-analytic results for internalizing behaviors

A total of 12 studies (1,073 participants) were included in the random-effects meta-analysis model. As shown in Figure 2, this model showed a significant positive combined effect size of child-father attachment insecurity and children's internalizing behaviors: Fischer's $z = 0.09$ (95% CI: 0.02, 0.15), $p = 0.01$. This is equivalent to an effect size of $r = 0.09$ (95% CI: 0.02, 0.15), or $d = 0.17$, 95% CI: 0.03, 0.31, a small effect size. Child-father attachment insecurity is thus associated with more internalizing behaviors. The funnel plot did not reveal asymmetry, and the Egger test was not significant ($z = 0.14$, $p = 0.89$), suggesting that studies with small sample sizes did not present more extreme values. The Q statistic ($Q = 9.63$, $p = 0.564$) and the I^2 value ($I^2 = 13.55$) did not indicate the presence of heterogeneity between studies. Thus, we did not examine the role of moderators for this meta-analysis.

3.3 | Comparing results of child-father attachment on externalizing versus internalizing behaviors

We examined whether child-father attachment was more strongly associated with externalizing behaviors or internalizing behaviors through a multilevel meta-analysis. The test of the difference in effect sizes between externalizing and internalizing behaviors included 27 effect sizes from 16 studies. The test revealed a marginal effect, with child-father attachment being more strongly associated with externalizing behaviors than internalizing behaviors: Fischer's $z = 0.10$, $SE = 0.05$, $p = 0.07$, 95% CI: -0.01, 0.21).

3.4 | Comparison with child-mother attachment meta-analytic results

We compared the results of this meta-analysis on child-father attachment and externalizing behaviors to the results of Fearon et al.'s (2010) meta-analysis on child-mother attachment and externalizing behaviors. The 85% confidence intervals overlapped (child-mother attachment: $d = 0.31$, 85% CI: 0.25, 0.37; child-father attachment: $d = 0.37$, 85% CI: 0.24, 0.52), suggesting that child-mother and child-father attachment insecurity are similarly associated with children's externalizing behaviors.

We also compared our meta-analytic results on child-father attachment and internalizing behaviors to the results of Groh et al. (2012) and Madigan et al. (2013) meta-analyses on child-mother attachment and internalizing behaviors (see Figure 3). The 85% confidence intervals overlapped (child-mother attachment [Groh]: $d = 0.15$, 85% CI: 0.08, 0.22; child-mother attachment [Madigan]: $d = 0.19$, 85% CI: 0.11, 0.26); child-father attachment: $d = 0.17$, 85% CI: 0.08, 0.26), suggesting that child-mother and child-father attachment insecurity are similarly associated with children's internalizing behaviors.

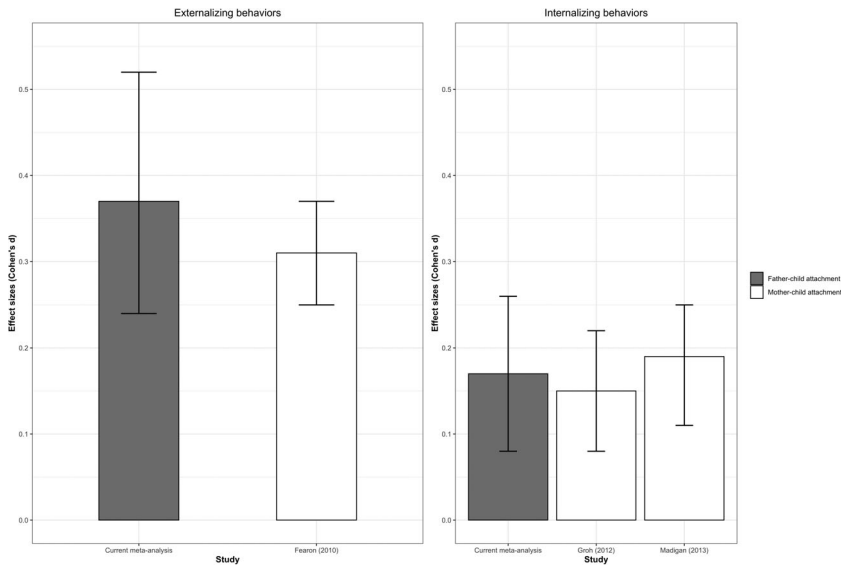


FIGURE 3 Visual representation of the effect sizes for child-mother and child-father attachment

4 | DISCUSSION

Attachment theory posits that children's relationships with caregivers can shape their development, notably in the domain of psychopathology (Bowlby, 1969/1982). A wealth of research has provided empirical support for this premise, especially in regard to child-mother attachment relationships, which has been synthesized meta-analytically (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013). Less attention has been dedicated to other members of children's attachment networks and their role in the development of behavior problems. In particular, it has been noted that parenting research has fixated on the role of child-mother attachment relationships, often to the exclusion of the child-father relationships (Cabrera et al., 2018; Cowan & Cowan, 2019). The rise in father involvement in childcare in recent decades due to various sociological trends, in combination with pleas by attachment theorists to include fathers in research endeavors (e.g., Cowan, 1997), has spurred a growing literature base on child-father attachment relationships, and the role of this relationship in promoting adaptive and/or maladaptive behavior (e.g., Brown & Aytugly, 2020; Cabrera et al., 2000, 2014, 2018; Cowan, 1997; Fagan et al., 2014). It was therefore timely to quantitatively summarize this body of research and to compare it to syntheses on child-mother attachment and behavior problems to understand how children's relationships to various members of their attachment network contribute to the development of behavior problems in children.

In the current study, we found a significant, positive association between child-father attachment insecurity in early childhood and externalizing behaviors ($r = 0.18$, $d = 0.37$, $k = 15$, $N = 1,304$). This effect size was moderate in magnitude (Funder & Ozer, 2019). We also found a small but significant positive association between child-father attachment insecurity in early childhood and internalizing behaviors ($r = 0.09$, $d = 0.17$, $k = 12$, $N = 1,073$). Together, these findings highlight the critical role that child-father attachment relationships play in their developmental trajectories.

These findings also call attention to the continued need to consider children's attachment networks when examining their developmental outcomes. While studies examining the independent contributions of each attachment relationship (such as the ones reported

here) are valuable, from an integrative perspective, even more insight can be gained from examining how various attachment relationships in children's attachment network impact child development (Dagan & Sagi-Schwartz, 2018). Consideration of the unique, cumulative, or multiplicative role of the attachment network on children's development would be especially informative. In the case of behavior problems, it may be that children with an insecure attachment relationship to both their fathers and mothers may be most at risk of developing behavior problems (additive hypothesis), or that a secure relationship to one of the parents buffers against the impact of an insecure relationship with the other parent (buffering hypothesis; Dagan & Sagi-Schwartz, 2018). This highly relevant question is addressed in a contribution to the current special issue (see Dagan et al., 2021; this issue), which revealed that children with one or more insecure relationships are more at risk of developing behavior problems (partial support for the additive hypothesis).

While the current study provides evidence that child-father attachment insecurity is associated with children's social maladaptation, research on the underlying mechanisms of this association is needed to advance further knowledge in this area and to effectively inform intervention efforts. One potential mechanism by which a secure child-father attachment may reduce the risk of behavior problems is through the type of play that fathers engage in with their children. It has been proposed that child-father play of a rough-and-tumble nature (e.g., wrestling, pretending to fight; StGeorge & Freeman, 2017), challenging paternal behaviors (e.g., behaviors that push the child out of their comfort zone) (Majdandžić et al., 2016), and/or activating behaviors (e.g., behaviors that excite, surprise, and destabilize the child; Volling et al., 2019), may help children to learn how to decode emotional cues during interactions. Further, these parenting behaviors may translate into higher relationship quality, as fathers would help the child express their emotions in appropriate ways when they feel frustration, fear, and/or excitement. Thus, these behaviors may provide a growth-enhancing opportunity to learn emotional regulation and emotional understanding, which children can then generalize to other social contexts. It is also possible that child characteristics (e.g., temperament, genetics) or other aspects of the family environment (e.g., the marital relationship) play a role in the association between child-father attachment and behavior problems (Brown & Aytuglu, 2020; Cabrera et al., 2014; Volling & Cabrera, 2019). Mechanisms by which child-father attachment promotes, or potentially derails, adaptation certainly warrant concerted attention in future research.

While the meta-analysis on externalizing behaviors indicated between-study heterogeneity, none of the moderators examined could explain the variability in effect sizes. Further, the meta-analysis on internalizing behaviors did not present sufficient heterogeneity to warrant examining moderators. This may be due, in large part, to the small sample sizes in both meta-analyses. That is, it is possible that a greater number of studies, with more diverse demographic characteristics, may yield more between-study heterogeneity. For example, there was little variability across studies in child gender (i.e., % male in samples), with the exception of the DeKlyen et al. (1998) study with 100% boys. Comparatively, the meta-analysis on child-mother attachment and externalizing behaviors included 14 effect sizes for boys, and 12 effect sizes for girls specifically (Fearon et al., 2010). Yet, it is worth noting that the lack of moderation by age converges with the meta-analysis on child-mother attachment, thereby suggesting that child-father attachment likely also has enduring effects on children's behavior problems. It is imperative for attachment research, and parenting research more broadly, to study child-parent attachment in more diverse samples to advance our understanding of the ways that child-father attachment promotes adaptation across populations. Similarly, the level and areas of involvement of fathers may be an important moderator of the relation between child-father attachment and social adaptation—levels of father involvement should thus be included in future research to examine this hypothesis.

Results showed that the pooled associations for child-father attachment on internalizing and externalizing behaviors were marginally different, with the association tending to be larger for externalizing behaviors. This result is consistent with the idea that fathers' physical play, within the context of a sensitive relationship, may be useful to learn how to regulate behaviors such as aggressiveness (Bureau et al., 2020). Consistent with Paquette's (2004) activation theory, child-father relationships may be more influential for socially relevant behaviors like externalizing problems, compared to more inward behaviors such as internalizing problems. As mentioned above, more research on the specific mechanisms by which child-father relationships influence child development is needed. In light of these results, a promising way forward would be to look at the interplay of paternal activating or challenging behaviors and sensitivity to try and identify the specific paternal behaviors that may confer an advantage or a risk to children's externalizing problems.

4.1 | Comparing the contribution of child-father and mother attachment for the development of child behavior problems

The pooled effect sizes for child-father attachment and behavior problems derived herein were statistically comparable to those of past meta-analyses on child-mother attachment and behavior problems (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013). This finding suggests that attachment to both mothers and fathers holds a similar influence on children's development of behavior problems. This finding is consistent with larger trends in fathering research, which emphasize that there are more similarities than differences between fathers and mothers (Cabrera et al., 2014; Fagan et al., 2014). For example, even at a neurophysiological level, men, like women, undergo important considerable hormonal and behavioral changes when becoming parents (Bakermans-Kranenburg et al., 2019). Our finding of comparable effect sizes between child-mother and child-father attachment and behavior problems stands in contrast with activation theory (Paquette, 2004), which suggests that while child-mother attachment is central to child-mother interactions, child-father attachment may not be a key part of child-father relationships. That said, *how* and *why* child-parent attachment confers risks for the development of behavior problems may be different for mothers and fathers, and as noted above, an examination of mechanisms of transmission warrants concerted attention in future research given its implications for intervention efforts.

Interestingly, our findings are consistent with Dagan and colleagues' individual participant data synthesis (2021; this issue), which also finds similar contributions of child-mother and child-father attachment to children's behavior problems. This is consistent with the views of scholars suggesting that mothers and fathers are more similar than different in terms of their impact on children's development (e.g., Fagan et al., 2014). Taken together, the current study and that of Dagan and colleagues help to build an understanding of the ways that children's attachment relationships are similar to one another, and how different relationships in the attachment network independently and jointly contribute to the development of children's behavior problems.

4.2 | Limitations and future directions

Several limitations of the current series of meta-analyses are worthy of note. First, meta-analyses are correlational in nature, making it inappropriate to derive conclusions regarding causation. Due to the limited sample size, we were also unable to examine if the study design (cross-sectional or longitudinal) moderated associations. Second, this

study is limited to assessments of attachment conducted in early childhood through observational coding. Thus, we did not include other methods of assessing attachment, such as representational methods and questionnaires (see e.g., Madigan et al., 2016). It is worth noting that it would be difficult to include such methods for child-father attachment specifically, as they often assess attachment representations generally versus specifically for mothers and/or fathers. Third, due to sample size restrictions, we were unable to examine whether the association between child-father attachment and behavior problems varied based on subclassifications of insecure attachment (i.e., avoidant, resistant, disorganized). Distinguishing between insecure classifications requires large sample sizes, something that is hard to achieve, especially with child-father samples, but important to strive toward in future research. The meta-analyses on child-mother attachment found important differences based on attachment subclassifications. For example, avoidant and disorganized attachment versus secure attachment created a particular risk for the development of externalizing behaviors (Fearon et al., 2010). Future studies on child-father attachment with larger sample sizes will be necessary to examine the subclassifications of insecure attachment and how they confer risk for children's behavior problems. An alternative lies in the use of continuous attachment measures, such as the ones that include a scale for each attachment pattern (e.g., avoidant, resistant, disorganized; Deneault et al., 2020; Fraley & Spieker, 2003; Groh et al., 2019; Shakiba and Raby, 2021). The use of such scales in future research could provide more statistical power to examine each insecure attachment type individually, even with smaller samples.

Finally, samples included in the current meta-analyses lacked socio-demographic diversity. For example, the lowest proportion of White fathers was 76%, all samples came from largely middle-upper class socio-demographic strata, and all but one sample included fathers in heterosexual relationships. This lack of diversity is part of a greater limitation in parenting research, whereby most research on child-father dyads is conducted with very homogeneous samples of White, middle-upper class, heterosexual, biparental fathers, largely from Westernized countries. Yet, fathers' role in the family may notably differ across socioeconomic status and cultures (Volling, & Cabrera 2019). It will be important for future research to collect data from more diverse samples to gain a fuller understanding of the ways that fathers from different backgrounds promote children's positive development.

5 | CONCLUSIONS

Our two meta-analyses provide important evidence on how the quality of children's attachment relationships with their fathers can contribute to children's (mal)adaptation. Child-father attachment in early childhood, much like child-mother attachment, matters for children's developmental trajectories. However, there is a need for additional research on child-father attachment and fathering, in conjunction with research on child-mother attachment and mothering, to move the field forward toward a greater understanding of the unique, cumulative, and multiplicative contribution of caregivers on child development. Moreover, research that advances knowledge on the potential mechanisms and mediating variables of child-parent attachment and child development is recommended. Such work is imperative to drive practice and policy initiatives that strive to optimize the developmental health of children globally.

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NOTE

¹ Some methodological choices across the two studies (e.g., Groh et al. had a narrower definition of internalizing behaviors than Madigan et al.; if multiple articles used the same sample, Groh selected the first published, whereas Madigan selected the largest *N*) could explain the difference in magnitude of effect sizes across the meta-analyses. That said, the effect sizes converge when Madigan et al., adjusted for publication bias.

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