Configurations of Mother-Child and Father-Child Attachment as Predictors of

Internalizing and Externalizing Behavioral Problems: An Individual Participant Data

(IPD) Meta-Analysis

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Abstract

An unsettled question in attachment theory and research is the extent to which children's attachment patterns with mothers and fathers *jointly* predict developmental outcomes. In this study, we used individual participant data meta-analysis to assess whether early attachment networks with mothers and fathers are associated with children's internalizing and externalizing behavioral problems. Following a pre-registered protocol, data from 9 studies and 1,097 children (mean age: 28.67 months) with attachment classifications to both mothers and fathers were included in analyses. We used a linear mixed effects analysis to assess differences in children's internalizing and externalizing behavioral problems as assessed via the average of both maternal and paternal reports based on whether children had two, one, or no insecure (or disorganized) attachments. Results indicated that children with an insecure attachment relationship with one or both parents were at higher risk for elevated internalizing behavioral problems compared with children who were securely attached to both parents. Children whose attachment relationships with both parents were classified as disorganized had more externalizing behavioral problems compared to children with either one or no disorganized attachment relationship with their parents. Across attachment classification networks and behavioral problems, findings suggest (a) an increased vulnerability to behavioral problems when children have insecure or disorganized attachment to both parents, and (b) that mother-child and father-child attachment relationships may not differ in the roles they play in children's development of internalizing and externalizing behavioral problems.

Keywords: Attachment, externalizing, father, internalizing, mother, network

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Research has shown that infants and children simultaneously and independently form attachment relationships with at least two caregivers (An et al., 2020; Easterbrooks & Goldberg, 1984; Goossens & Van IJzendoorn, 1990; Grossmann et al., 2002; Grossmann et al., 1981; Lamb, 1978; Main & Weston, 1981; Sagi-Schwartz & Aviezer, 2005). Based on these findings, Van IJzendoorn, Sagi, and Lambermon (1992) stated that it is necessary to take into account how early attachment to fathers (and other potential caregivers) interact with mother-child attachment patterns when assessing the predictive power that attachment may have on children's developmental outcomes. To assess the interaction between attachments to multiple caregivers, Van IJzendoorn et al. (1992) proposed the *Integrative Hypothesis*, according to which two early parental attachment relationships—hereafter referred to as an "attachment network"—carry forward to *jointly* affect developmental outcomes.

In line with the integrative hypothesis, a move from the traditional view of mother-child attachment to a more ecologically valid, multiple-caregiver framework was recommended decades ago to more accurately represent the social context of development (e.g., Belsky, 1981; Kozlowska & Hanney, 2002). Recently, efforts have also been made to extend attachment network research to children who are adopted by same-sex couples (Carone et al., 2020; McConnachie et al., 2020). However, attachment research has yet to offer a robust reply to such calls. Among studies that have assessed children's attachment to multiple caregivers (mostly mothers and fathers), sample sizes have been limited (N = 20–186 parent-child dyads); such underpowered study samples might have contributed to mixed findings regarding the multiple-caregiver configuration that best predicts developmental

outcomes. It is possible that these mixed findings have contributed to inconsistent associations between the configuration of children's attachment patterns and developmental outcomes (Dagan & Sagi-Schwartz, 2018, 2020). In this Individual Participant Data (IPD) meta-analysis, we aimed to focus on the joint effect of children's attachment networks on a specific set of developmental outcomes: internalizing and externalizing behavioral problems.

Early Attachment Patterns and Internalizing and Externalizing Behavioral Problems

According to attachment theory, infants form selective attachment relationships through repeated interactions with their parents or other primary caregivers (Bowlby, 1969). Children may develop secure attachment relationships when parents are available and responsive in times of need. As a result, these children are likely to derive a sense of safety from physical or perceived proximity to caregivers when facing distress. As such, securely attached children tend to exhibit behavior that reflects flexibility in switching from exploration of the physical environment to proximity seeking to caregivers in times of need. However, when parents respond insensitively to children's distress, children are more likely to develop insecure attachment patterns (i.e., insecure-avoidant or insecure-resistant attachment). A second dimension of attachment is disorganized attachment, in which children are likely to show conflicted, apprehensive or disoriented behavior towards their caregiver when alarmed by the Strange Situation (Main & Solomon, 1986). Disorganized attachment has been linked to a child's experience of frightening, frightened, or disruptive behaviors by caregivers (Cyr et al., 2010; Madigan et al., 2006; Main & Hesse, 1990; Schuengel et al., 1999). Over time, attachment patterns (assessed in most prior work with mothers)--in tandem with individual and ecological factors-predict an array of long-term developmental outcomes, including internalizing and externalizing behavioral problems (though effect sizes are modest; Colonnesi et al., 2011; Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2013; Spruit et al., 2020).

Bowlby (1973, 1980) hypothesized that children's vulnerability to depression and anxiety, the hallmarks of internalizing disorders, stems from early insecure attachment patterns. He proposed that anxiety may be both predisposed and sustained by the expectation of others as unavailable in times of need, and that depression may be predisposed and sustained by the expectation that efforts to seek help or closeness with others are futile. Bowlby also proposed that aggressive behavior may be predisposed and sustained by a child's expectation that others require coercion or pestering in order to be available, and inhibition of feelings of trust and closeness; accordingly, he anticipated that insecure attachment would be an important developmental process underpinning such expectations.

Empirical evidence has supported attachment theory's claims about the link between early life insecure attachment and later internalizing and externalizing behavioral problems. Meta-analyses have yielded significant associations between (mostly mother-child) insecure attachment, as assessed by observational measures, and both internalizing (Colonnesi et al., 2011, $d = 0.41$ [for anxiety symptoms]; Groh et al., 2012, $d = 0.15$; Madigan et al., 2013, $d = 0.19$; Spruit et al., 2020, $d = 0.32$ [for depression symptoms]) and externalizing (Fearon et al., 2010, $d = 0.31$) behavioral problems. After decomposing insecure attachment to its different subtypes, both organized (i.e., insecure-avoidance, but not insecure-resistant) and disorganized insecurity were significantly (yet modestly) associated with externalizing behavioral problems ($d = 0.12$ and $d = 0.34$, respectively; Fearon et al., 2010). Only insecure-avoidance (but not disorganized) attachment was linked to internalizing behavioral problems ($d = 0.17$, when compared to all other attachment classifications; Groh et al., 2012, and $d = 0.29$ when compared with securely attached children; Madigan et al., 2013). It thus remains an open question whether the predictive power of a single (organized and disorganized) insecure parent-child attachment to predict internalizing and externalizing behavioral problems may be extended to attachment networks with two parents.

To date, only two studies have directly assessed the predictive power of the secure/insecure (but not organized/disorganized) attachment network to mothers and fathers, as assessed via observational dyadic measures, for internalizing and externalizing behavioral problems. Kochanska and Kim (2013) assessed 86 children for their attachment patterns to both mothers and fathers via the Strange Situation Procedure (SSP; Ainsworth et al., 1978) at age 15 months, and their self-reported internalizing and externalizing behavioral problems at age eight years. They found that children who were insecurely attached to both parents reported significantly more internalizing and externalizing behavioral problems than children who were insecurely attached to only one parent (irrespective of which parent). In addition, children who were insecurely attached to only one parent, either mother or father, reported having comparable internalizing and externalizing symptom levels to children with no insecure attachments. Recently, Bureau et al. (2020) reported on 83 children between the ages of 3 and 5 who were assessed for attachment security with both mothers and fathers using a modified separation-reunion procedure (Cassidy et al., 1992). When children were 9 years of age, those children insecurely attached to both parents reported more externalizing symptoms compared to children who were securely attached to at least one parent.

Individual Participant Data Meta-Analysis

A large number of mother-child and father-child attachment assessments are needed to permit comparisons between the four different attachment network configurations. That is, four configurations of secure/insecure attachment networks [(a) insecure with both parents (I-I); (b) secure with mother, insecure with father (S_M-I_F); (c) insecure with mother, secure with father (I_M-S_F); (d) secure with both parents (S-S)], and four configurations of organized/disorganized attachment networks [(a) disorganized with both parents (D-D); (b) organized with mother, disorganised with father (nonD$_M$-D$_F$); (c) disorganized with mother, organized with father (D$_M$-nonD$_F$); (d) organized with both parents (nonD-nonD)].

Aggregation of data from existing studies offers a means to permit such comparisons (see hypotheses regarding such comparisons below).

IPD meta-analysis entails the accumulation and aggregation of raw participant data from relevant studies (Riley et al., 2010; Verhage et al., 2020). Bringing together individual participant data from multiple studies that assessed child attachment patterns to both parents and developmental outcomes enables reconfiguration of previously collected data according to a-priori models (e.g., create groups such as S-S/nonD-nonD and I-I/D-D) that may or may not have been considered in the original studies. This approach also significantly increases the statistical power to detect the potential associations between attachment networks and developmental outcomes. Furthermore, gathering raw data enables the standardization and harmonization of outcome data from multiple outcome measures used in the original studies (some of which may have not been reported) to arrive at a more comprehensive set of outcome constructs of interest. Lastly, IPD meta-analysis also allows for examination of moderator effects to test the boundaries of the investigated models (Ioannidis, 2017).

The Present Study

The original Integrative Hypothesis set forward by Van IJzendoorn et al. (1992) was further developed by Dagan and Sagi-Schwartz (2018, 2020) in order to capture the relations between all possible mother-child/father-child attachment configurations. They identified two sets of competing hypotheses (see Research Questions 1 and 2 below). These hypotheses are ultimately combined into four mutually exclusive integrative models (see Research Questions 3 below) that are most likely to fit data representing the predictive power of attachment networks on developmental outcomes. The present study aims to assess these attachment network integrative models based on three pre-registered research questions (https://osf.io/a3qs9) that are summarized below. Consistent with the pre-registration, this study is set to assess only the main effects of attachment networks on the internalizing and

externalizing behavioral problems, and future analyses will assess the contextual factors (e.g., growing up in poverty) which may influence such effects.

Research Question 1: Is the Number of Insecure or Disorganized Attachments Important in Predicting Internalizing and Externalizing Behavioral Problems?

According to the *Additive Hypothesis,* there is a linear "dose-response" association between the number of secure or organized attachment patterns and developmental outcomes. In contrast, the *Buffering Hypothesis* predicts that secure or organized attachment to one parent is sufficient to offset the risk effects of an insecure or disorganized attachment to the other, respectively; moreover, this hypothesis predicts that there is no advantage to having a secure or organized attachment to both parents. Evidence in support of the Additive Hypothesis (e.g., Main & Weston, 1981) and the Buffering Hypothesis (Bureau et al., 2020; Kochansla & Kim, 2013), has been reported, rendering both hypotheses worthy of consideration. However, in line with attachment theory, which predicts that attachment security contributes to a lower risk for behavioral problems, as well as with the single parent-child meta-analytic results described above, indicating that secure attachment confers less child internalizing and externalizing behavioral problems, our hypothesis in the current study is consistent with the Additive Model. That is, children with secure or organized attachment to both parents were expected to have fewer internalizing and externalizing behavioral problems than children with secure or organized attachment to only one parent, respectively. We also hypothesized that children with secure or organized attachment to only one parent would have fewer behavioral problems than children with insecure or disorganized attachments to both parents, respectively.

Research Question 2: Does the Quality of Attachment to One Caregiver Predict Internalizing and Externalizing Behavioral Problems Better Than to the Other?

As previously proposed (Bowlby, 1969; Bretherton, 1985; Van IJzendoorn et al., 1992), the *Hierarchical Hypothesis* suggests that one parent influences the developmental outcomes of the child more than the other parent. In contrast, the *Horizontal Hypothesis* (Dagan & Sagi-Schwartz, 2018, 2020) predicts that children with a secure or organized attachment to only the mother should exhibit similar developmental outcomes to those who form a secure or organized attachment only to the father. Evidence for the Hierarchical and the Horizontal Hypotheses was demonstrated in the past (e.g., Suess et al., 1992, and Kochanska & Kim, 2013, respectively). Despite the increasing involvement of fathers in caregiving (Pleck, 2010)- rendering the Horizontal Hypothesis plausible- mothers in Western countries in which attachment research has been conducted are more involved, on average, than fathers across a number of childrearing domains (e.g., Europe and the USA; Bakermans-Kranenburg et al., 2019; Parker & Wang, 2013), and that more time spent in child care may amplify the impact of the quality of the parent-child relationship. Thus, in this study we hypothesized that children's internalizing and externalizing behavioral problems will be predicted in accordance with the Hierarchical Model. That is, children with a secure or organized attachment only to mother will show fewer internalizing and externalizing behavioral problems than children with a secure or organized attachment only to father, respectively.

Research Question 3: Which Attachment Network Model Accounts Best for Children's Internalizing and Externalizing Behavioral Problems?

Overall, the hypotheses presented in research questions 1 and 2 can be formulated as four mutually exclusive explanatory integrative models: (a) Additive-Hierarchical, (b) Additive-Horizontal, (c) Buffering-Hierarchical, and (d) Buffering-Horizontal (see Table 1 for the model-based predictions, including the relations between the different attachment configurations within each integrative model). Empirical evidence supporting each of the four

hypotheses- as mentioned in research questions 1 and 2- suggests that all of the four models are plausible. However, integrating our hypotheses described in Research Questions 1 (i.e., the Additive Model) and 2 (i.e., the Hierarchical Model), we hypothesized that internalizing and externalizing behavioral problems outcomes will be best accounted for by the Additive-Hierarchical Model. That is, children who have secure attachments to both mothers and fathers will show the fewest internalizing and externalizing behavioral problems compared to all other secure/insecure attachment network groups, followed by children who have a secure attachment only to the mother, then those who have a secure attachment only to the father, and finally, those children with insecure attachments to both parents, who will exhibit the most internalizing and externalizing behavioral problems. In the same manner, we hypothesized that children who have organized attachments (i.e., secure, insecure-avoidant, or insecure-resistant) to both parents will show the fewest internalizing and externalizing behavioral problems compared to all other organized/disorganized attachment network groups, followed by children who have an organized attachment only to the mother, then those who have an organized attachment only to the father, and children with disorganized attachments to both parents exhibiting the most internalizing and externalizing behavioral problems.

INSERT TABLE 1 ABOUT HERE

Method

Protocol, Registration, and Reporting

This study is part of a larger research project that aims to assess the predictive power of the attachment network to mother and father on multiple developmental outcomes. Authors of all eligible studies were invited to share their datasets and participate in the project of the Collaboration on Attachment to Multiple Parents and Outcomes Synthesis

(CAMPOS; see pre-registered protocol at https://osf.io/a3qs9). We have adhered to the

Preferred Reporting Items for Systematic Reviews and Meta-analysis of Individual

Participant Data (PRISMA-IPD) statement (Stewart et al., 2015).

Eligibility Criteria

We sought all available studies that assessed (1) infant/child attachment to both

mothers and fathers, (2) via an attachment behavioral coding measure for caregiver-child

(i.e., excluding parent-report, parent-observation, self-report, self-observation, and projective

measures), and (3) either concurrent or later internalizing and/or externalizing behavioral

problems.

Study Identification and Selection

Studies for the current project were identified through a number of means. First, the

Child Attachment Studies Catalogue and Data Exchange (CASCADE) at the Determinants of

Child Development Lab in the Department of Psychology, University of Calgary, with the

permission and supervision of the lab director, Dr. Sheri Madigan. CASCADE is a catalogue

of all research studies published up until 2017 that have assessed observational measures of

infant and child attachment. These studies were obtained through searches in the following

databases: Medline, EMBASE, PsychINFO, Web of Science, and Dissertation Abstracts

International. After removing duplicate datasets, the search yielded a total of 35 studies

meeting inclusion criteria. See Figure 1 for the study selection flow chart.

INSERT FIGURE 1 ABOUT HERE

Data Items

Authors of eligible studies were asked to provide data on the observational (but not

self-reported; e.g., the Security Scale, Kerns et al., 1996) attachment assessments (i.e.,

attachment classifications and, if available, continuous scores for the various attachment

coding scales). Accordingly, observational attachment measures in this study included the following: Attachment Q-Sort (AQS; Waters & Deane, 1985), the SSP, two modified SSP coding systems for preschool children (the MacArthur Preschool Attachment Coding System [PACS], Cassidy et al., 1992; Preschool Assessment of Attachment [PAA], Crittenden, 1992), and the Main & Cassidy Age 6 Scoring System (Main & Cassidy, 1988). Authors were also asked for all accessible outcome data that matched any of the outcome domains that were pre-registered, including the focal outcome data presented in this study (i.e., internalizing and externalizing behavioral problems; see pre-registered minimum detectable effect size sensitivity power analyses that justified collecting data on these outcomes: https://osf.io/tcj45). We also requested demographic data on both children (i.e., gender, age at the time of both attachment and internalizing/externalizing behavioral problems assessment, and psychosocial risk status) and parents (i.e., age at the time of attachment assessments, education, ethnicity, relationship status, whether the parent was adoptive or non-adoptive, and psychosocial risk status), all of which were measured at the time of one or both of the child-parent attachment assessments. If individual-level demographic data was not provided, it was extracted from the study-level information indicated in the published papers or communicated by the authors.

The pooled analytic sample size was $N = 1,097$, of which half (49.6%) were female. At the time of the first attachment assessment, the mean age of children was 28.67 months ($SD = 22.74$), the mean age of mothers was 32.14 years ($SD = 5.70$), and that of fathers was 33.78 years ($SD = 6.45$). Mothers and fathers were mostly White (88.1% and 86.5%, respectively), highly educated (77.7% of mothers and 68.1% of fathers had post high school education), and employed (69.5% of mothers and 66.9% of fathers). The vast majority of mothers (98.1%) and fathers (95.2%) were biological parents, and virtually all of the parents (99.3%) resided in the same household at the time of the attachment assessments with their

children. The average time gap between attachment assessments with mother and father was approximately one month (0.92 months, *SD* = 0.78, range: 0 - 5.09 months), and the average interval between initial attachment assessments with both parents and subsequent assessment of internalizing and externalizing behavioral problems was 1.34 years (*SD* = 2.56, range: 0 - 10.79 years). For a description of the studies see Table S1.

Data Verification

All data were checked for numerical anomalies (e.g., parent age of 99). When available, the descriptive statistics of the requested variables were compared with the data reported in the publications. Inconsistency was noted in one study; the principal investigator was contacted and the discrepancy was resolved.

IPD Synthesis Methods

In the case that a study reported on multiple attachment measures, preference was given to data derived from the SSP[2] since this measure has been most widely used in the attachment literature. When Attachment Q-Sort (AQS; Waters & Deane, 1985) scores were reported, we followed previous studies and recoded them into binary secure/insecure variables such that scores above 0.40 were considered secure (Lehman et al., 1992; Verhage et al., 2018). No organized/disorganized attachment categories were extracted from studies that used AQS to assess attachment patterns. Children were then grouped into binary Secure/Insecure and Organized/Disorganized attachment categories with both parents, with insecure-avoidant and -resistant attachment categories regarded as Insecure regardless of their disorganization classification.

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[2] In order to avoid a carryover effect from the first SSP with one parent to the second SSP with the other parent (Granqvist et al., 2016), the five studies that used (non-modified) SSPs in the current pooled sample were conducted in customary intervals of between 1-3 months, and adhered to the SSP instructions to curtail the SSP in cases where infants exhibited high distress. Of note, three of these five studies assessed mother-child and father-child SSP in a counterbalancing fashion.

The vast majority of the studies reported internalizing and externalizing behavioral problems via the Child Behavior Checklist (CBCL; Achenbach, 1991; Achenbach et al., 1987). To harmonize outcome data reported in two studies via the Strengths and Difficulties Questionnaire (SDQ; Goodman et al., 1998), we selected the subscales that have shown strong associations with the CBCL internalizing and externalizing scale scores (i.e., the Emotional Symptoms and Conduct Problems scores, respectively), and converted them into T scores (for details on the outcome harmonization procedure, please see https://osf.io/s75th). Of note, we excluded one study (Kennedy et al., 2014) that assessed internalizing and externalizing behavioral problems via the teacher reported Child Behavior Scale (CBS; Ladd & Profilet, 1996) given that there is currently no robust available data on the concordance of CBS with either SDQ and CBCL, and that no item level data was available by the study authors to allow for item level data harmonization. To reduce bias, our analyses involved the average of mother and father behavioral problems reports, which in the pooled sample were largely correlated (r = .47, p < .001 for both internalizing and externalizing behavioral problems).

Handling Missing Data

We first used multiple imputation for missing demographic and outcome variables within each study separately, retaining the first imputed set of values. For variables with missing outcome or covariate values for the entire study, we conducted multiple imputation based on similar studies which had outcome data for similar age ranges to allow for comparable T score imputation. We then merged all imputed study files into a single dataset and conducted multiple imputation for all demographic variables with missing values for the entire study based on the entire pooled dataset (for details on missing data imputation per study see Table S2). We performed all subsequent analyses with both imputed and complete-cases merged datasets.

Analytic Approach

We first harmonized the outcome data across studies and handled missing data by performing multiple imputations for each independent variable in SPSS, version 25. We then conducted a one-step IPD meta-analysis on the pooled dataset. To account for the clustering of mother-child/father-child triads within studies, we performed separate linear mixed effects analyses for the association between attachment network and both internalizing and externalizing behavioral problems using the "lme4" package (Bates et al., 2015) in R (R Core Team, 2021). We fit the data with a random effects model. Models included random intercepts for the study identity (i.e., the study from which the individual participant data was pooled from), and fixed effects for (a) attachment networks and (b) covariates that were significantly associated with both attachment networks and the outcome variable.

In this study we tested both for a presence of an effect (i.e., significant difference in outcomes between attachment network groups) and for an absence of a meaningful effect (i.e., non-significant difference in outcomes between attachment network groups). Where attachment network proved to be a significant predictor, we followed up with planned comparisons via the "emmeans" package (Russell, 2020) in R. For non-significant comparisons we performed equivalence testing, using the "TOSTER" package (Lakens, 2017) in R, with equivalence bounds set for small effect size ($-0.20 < d < 0.20$) and alpha of 0.05. Given that traditional null hypothesis testing can only reject an absence of an effect but not statistically support it, equivalence testing allows for more confidence in determining whether an absence of a significant difference between the attachment network groups is indeed zero. Finally, we performed the following sensitivity analyses: (a) we compared internalizing and externalizing behavioral problems outcomes from different informants (i.e., mother, father, and average of their reports), and (b) we compared the effects of the complete-case versus the imputed pooled dataset.

Results

Below we report the results based on the imputed pooled dataset models with significant main effects of attachment networks on internalizing and externalizing T scores obtained from an average of mother and father behavioral problems reporting. For mean and standard deviation internalizing and externalizing scores reported by each parent individually and by both parents on average, we refer to Table 2. For a complete set of results from both the complete-case and imputed datasets, we refer to Tables 3 to 5.

INSERT TABLE 2 ABOUT HERE

Research Question 1: Is the Number of Insecure or Disorganized Attachments Important in Predicting Internalizing and Externalizing Behavioral Problems?

Internalizing behavioral problems. When attachment networks were considered in terms of security/insecurity, planned comparisons revealed a non-significant difference in T scores between children who had insecure attachment patterns with both parents and children who either had insecure attachment to a single parent or with no parent [t (1092) = -0.25, p = 0.81; d = 0.08, 95% CI = -0.07, 0.23]. The equivalence test was non-significant [t (320.4) = 1.58, p = 0.06], suggesting that group sizes were insufficient to determine whether the observed effect was statistically different from zero. However, children who were classified as insecurely attached to one parent had more internalizing behavioral problems than children who were securely attached to both parents [t (1093) = -2.77, p = .006, d = 0.18, 95% CI = 0.05, 0.32]. We did not find a significant difference in children's internalizing behavioral problems between the attachment network groups when dichotomizing attachment classifications as organized or disorganized.

Externalizing behavioral problems. We did not find a significant difference in children's externalizing behavioral problems between the attachment network groups in terms

of security/insecurity. However, for organized/disorganized attachment classifications, planned comparisons indicated a significant difference between children who showed a disorganized attachment to both parents and those who were disorganized with either a single parent or with none [t (956) = 2.18, p = 0.03, d = 0.47, 95% CI = 0.13, 0.82]. We did not find a significant externalizing behavioral problems T score difference between children who were classified as organized with both parents and those who were disorganized with a single parent [t (959) = -1.59, p = 0.11; d = 0.12, 95% CI = -0.05, 0.28]. The equivalence test was non-significant [t (252.55) = 1.00, p = 0.16], suggesting that data were insufficient to draw robust conclusions on these groups' potential null mean differences.

INSERT TABLE 3 ABOUT HERE

Research Question 2: Does the Quality of Attachment to One Caregiver Predict Internalizing and Externalizing Behavioral Problems Better Than to the Other?

     Internalizing behavioral problems. We did not find significant differences in the average of mother and father reported internalizing behavioral problems between the attachment network groups on either the secure/insecure [t (377) = -0.24, p = -0.81; d = 0.02, 95% CI = -0.17, 0.22] or the organized/disorganized levels [t (176) = 0.44, p = 0.66; d = 0.18, 95% CI = -0.12, 0.48]. Equivalence testing was significant for the secure/insecure attachment network comparison [t (379.48) = 1.78, p = 0.04], but non-significant for the organized/disorganized attachment network comparison [t (166.91) = -.015, p = 0.44].

     Externalizing behavioral problems. No significant differences emerged in the average of mother and father reported externalizing behavioral problems between the two secure/insecure [t (383) = 1.59, p = 0.11; d = 0.16, 95% CI = -0.04, 0.36] and the organized/disorganized [t (179) = -0.46, p = 0.64; d = 0.05, 95% CI = -0.25, 0.34] attachment networks. In both planned comparisons, equivalence testings were non-significant [t (380) = -

0.40*, p* = 0.34] in the secure/insecure attachment network comparison, and *t* (168.49) = 1.01*,*

p = 0.18] in the organized/disorganized attachment network comparison.

INSERT TABLE 4 ABOUT HERE

Research Question 3: Which Attachment Network Model Best Predicts Children's

Internalizing and Externalizing Behavioral Problems?

      Internalizing behavioral problems. In performing planned comparisons between the

secure/insecure attachment networks, we found no difference between children who had

insecure attachment patterns with both parents and those who did not [*t* (1093) = -0.64, *p* =

0.52); *d* = 0.08, 95% CI = -0.07, 0.23]. The equivalence test was non-significant [*t* (320.4) =

1.54, *p* = 0.06], suggesting that data were insufficient to draw robust conclusions about a

meaningful effect. We found that children who were classified as securely attached to both

parents had lower internalizing behavioral problems than those who were securely attached to

a single parent [*t* (1094) = -2.77, *p* = .006, *d* = 0.18, 95% CI = 0.05, 0.32]. In addition, results

indicated no significant difference in parent-reported behavioral problems for children who

were classified as securely attached only to mother and those classified as securely attached

only to father [*t* (1093) = 0.23, *p* = 0.82; *d* = 0.02, 95% CI = -0.17, 0.22]. The equivalence

test was significant [*t* (412.86) = 1.80, *p* = 0.04], suggesting that the difference in mean

behavioral problems between these groups was negligible.

      Externalizing behavioral problems. Planned comparisons revealed that children

who were disorganized with both parents were non-significantly different on externalizing

behavioral problems T scores from children who had one or no disorganized attachments

within their network [*t* (949) = 1.95, *p* = 0.05]. However, field specific effect size (Schuengel

et al., 2021) was medium, and confidence intervals did not include zero [*d* = 0.47, 95% CI =

0.13, 0.82], suggesting that children who were disorganized with both parents had higher

externalizing behavioral problems T scores from children who had one or no disorganized attachments within their network. In addition, we found no significant difference in reported behavioral problems between children who were disorganized with one parent and children with no disorganized classifications [t (964) = -1.47, p = 0.14; d = 0.12, 95% CI = -0.05, 0.28]. The equivalence test was non-significant [t (252.55) = 1.00, p = 0.16], suggesting that data was insufficient to draw robust conclusions on these groups' potential null mean differences. Additionally, we found no significant difference in reported behavioral problems for children who were classified as disorganized only with mother versus those who were disorganized only with father [t (955) = -1.47, p = 0.47; d = 0.05, 95% CI = -0.25, 0.34]. The equivalence test was not significant [t (170.99) = -1.01, p = 0.16], indicating that the data were insufficient to draw robust conclusions about whether the mean behavioral problems difference between these groups was different from zero.

INSERT TABLE 5 ABOUT HERE

Sensitivity Analyses

Single parent behavioral problems report

In the following, we report only on results that differed from mother-father average behavioral problems reports in the pooled dataset. For the complete set of results refer to Tables 3 to 5.

Research question 1: Externalizing behavioral problems. Secure/insecure attachment networks were associated with mother-reported behavioral problems. Children who were insecurely attached to both parents were reported to have significantly more externalizing behavioral problems compared to children who had either one or no insecure attachments within their network [t (1095) = 2.07, p = 0.04, d = 0.25, 95% CI = 0.10, 0.40]. However, no significant behavioral problems T scores difference was found between children

with insecure attachment to one parent and children without any insecure attachments [t (1104) = -0.68, p = 0.49], and the equivalence test was significant [t (879.28) = 2.42, p = 0.008].

Regarding organized/disorganized attachment, whereas in both father-report and average of mother-father reports attachment network was associated with externalizing behavioral problems, the significant planned comparisons differed. Specifically, when assessing father-report behavioral problems, we did not find differences in externalizing behavioral problems between children who were disorganized with both parents and those who were disorganized with either a single parent or with none of the parents [t (955) = 1.49, p = 0.14]. Equivalence testing was non-significant [t (33.32) = -0.59, p = 0.72]. However, children who had one disorganized attachment had higher externalizing behavioral problems T scores than children who were organized with both [t (960) = -2.38, p = 0.02, d = 0.18, 95% CI = 0.02, 0.35].

Research question 3: Externalizing behavioral problems. Planned comparisons for father-reported behavioral problems somewhat differed from the results we obtained when assessing externalizing behavioral problems via the average of mother-father reports. Unlike the results obtained for the average of mother-father behavioral problem reports, children who were disorganized with a single parent had higher externalizing behavioral problems T scores compared with those who were classified as organized with both parents and those [t (957) = -2.40, p = 0.02, d = 0.18, 95% CI = 0.02, 0.35].

Complete-case data set

In the following, we report complete-case planned comparisons that differed from the pooled dataset main study analyses of mother-father average behavioral problem reports. For the complete set of results refer to Tables 3 to 5. For results using the complete-case dataset internalizing and externalizing scores refer to Table S3.

Research question 1: Externalizing behavioral problems. Unlike the results obtained in the imputed dataset, planned comparisons performed in the complete-case dataset revealed that secure/insecure attachment networks were associated with the average of mother and father reported externalizing behavioral problems. Children who were insecurely attached to both parents were reported to have significantly more externalizing behavioral problems compared to children who had either one or no insecure attachments within their network [t (755) = 2.34, p = 0.02]; in both the imputed and the complete datasets, no significant T scores difference was found between children with insecure attachment to one parent and children without any insecure attachments.

In addition, organized/disorganized attachment networks were associated with the average of mother and father reported externalizing behavioral problems, though in a somewhat different order. Whereas in both the imputed and complete-case datasets children who had disorganized attachment patterns with both parents had higher mean behavioral problems T scores than children with either one or no disorganized attachment, only in the complete-case dataset did children who were classified as disorganized only with one parent show higher behavioral problems T scores than those who had no disorganized attachment to any of the parents [t (729) = -2.19, p = 0.03].

Research question 3: Externalizing behavioral problems. Planned comparisons performed in the complete-case dataset showed that, unlike the results obtained in the pooled dataset, children who were insecurely attached to both parents were reported to have significantly more externalizing behavioral problems compared to children who had either one or no insecure attachments within their network [t (756) = 2.14, p = 0.03]. We also found that results from the complete-case dataset differed somewhat from the ones we obtained in the imputed dataset with respect to the organized/disorganized attachment networks. That is, children who were disorganized with both parents had higher externalizing behavioral

problems T scores from children who had one or no disorganized attachments within their network [t (718) = 2.17, p = 0.03], and children who were disorganized with one parent had higher externalizing behavioral problems T scores than children who had no disorganized attachments with any of their parents [t (730) = -2.06, p = 0.04].

Discussion

In this study we aimed to address a fundamental question in attachment research: What role does the attachment network to mothers and fathers play in children's internalizing and externalizing behavioral problems outcomes? Evaluating 1,097 children and their parents across 9 studies from Canada, Europe, and the USA revealed that the answer to this question depends both on the forced binary attachment classification (i.e., secure/insecure and organized/disorganized) and the nature of internalizing versus externalizing behavioral problems. Children who were insecurely attached to either one or two of their parents-- irrespective of which parent--had more internalizing behavioral problems compared with children who were securely attached to both parents. Moreover, children who were disorganized with both parents had more externalizing behavioral problems compared with children who were organized with either two parents or a single parent, regardless of which parent. These findings add to growing literature and increased interest in investigating father-child attachment and its role in developmental trajectories, evidenced by a surge in the number of meta-analytic studies on the subject (Deneault et al., 2021; Schuengel et al., 2021), and in two recent special issues on the subject in *Attachment & Human Development* (Ahnert & Schoppe-Sullivan, 2020; Cowan & Cowan, 2019).

The Effect of Secure/Insecure Attachment Network on Internalizing Behavioral Problems: It Takes Two?

When assessing associations between attachment configurations and internalizing behavioral problems, the number of secure attachment relationships within an early

attachment network was important. Unlike our hypothesis (i.e., that the Additive-Hierarchical model would be corroborated), we obtained partial support for the Additive-Horizontal Model (Dagan & Sagi-Schwartz, 2018, 2020; S-S < S_M-I_F = I_M-S_F = I-I; see Figure 2a). As suggested by the Additive hypothesis, children with a single secure attachment had higher internalizing behavioral problems T scores compared with children with two secure attachment relationships. However, contrary to the Additive hypothesis, children who were insecurely attached to both parents exhibited similar internalizing behavioral problems T scores compared to those with one secure attachment. In addition, the Horizontal hypothesis was corroborated by the results, which indicated that children with a secure attachment to either mother or father exhibited non-significant differences in their mean internalizing T scores.

These results add an important dimension to previous meta-analytic findings on the link between early insecure attachment patterns to one parent and internalizing behavioral problems. Whereas a single child-parent insecure attachment was shown to be modestly associated with more internalizing behavioral problems (d = 0.15, 95% CI = -0.06, 0.25, Groh et al., 2012; d = 0.19, 95% CI = 0.09, 0.29, Madigan et al., 2013; Deneault et al., 2021 [this issue]), our findings suggest that the quality of children's attachment to the other parent is also important. That is, a secure attachment to the second parent is significantly associated with fewer internalizing behavioral problems. Relatedly, our findings answer the question that was previously posed regarding the contributing role of father-child attachment to internalizing behavioral problems relative to that of the mother-child's: the available data suggests that there is no significant difference in importance between the two.

Unlike our expectations (i.e., that the Additive Hypothesis would be confirmed) and prior attachment network research (Kochanska & Kim, 2013), it appears that it takes two-- and not merely one--secure attachment to primary caregivers to buffer children from

increased vulnerability to experiencing internalizing behavioral problems. It is thus possible that simply having an insecure attachment relationship within the child's network is enough to introduce comparatively heightened and more prolonged distress at times of need (Groh & Narayan, 2019; Sroufe et al., 2005). Such elevated distress levels, in turn, may significantly increase internalizing behavioral problems (Hammen, 2005). An important caveat, however, is that this IPD only included samples of children from intact families with two heterosexual parents. Thus, findings may not be generalizable to families with same-sex parents or single-parent families.

Still, it remains unclear why a secure attachment to one parent does *not* buffer children with insecure attachment to another parent from experiencing increased internalizing behavioral problems. One factor that is worth considering is the different level of involvement in childrearing between mothers and fathers in intact two-parent families (Bakermans-Kranenburg et al., 2019; Brown et al., 2011; Renk et al., 2003). It is plausible that differential involvement in childrearing by mothers and fathers, may play a role in the effect on the child's development, including levels of internalizing behavioral problems, depending on the quality of attachment to the more involved parent. In this study, we were unable to assess levels of parental involvement, and it thus remains to be determined whether such differences in engagement by the parent with whom the child has an insecure attachment can explain the absence of a buffering effect when the child has a single secure attachment.

We did not find significant differences in externalizing behavioral problems T scores between the secure/insecure attachment network groups. This result is at odds with previous meta-analytic findings on the association between insecure attachment to a single child-parent (mostly mother-child) attachment and externalizing behavioral problems (Fearon et al., 2010), which indicated that the effect of this association was significant and of moderate strength ($d = 0.31$, 95% CI $= 0.23$, 0.40). Of note, in our study we did find a significant effect

of secure/insecure attachment networks on mother-reported externalizing behavioral problems (i.e., S-S = S-I < I-I), which aligns with the significant association found between the security of a single parent-child attachment and mother-reported externalizing behavioral problems (Fearon et al., 2010). It is also worth noting that the magnitude of the meta-analytic effect that was reported on the single parent-child attachment was strongly driven by attachment disorganization ($d = 0.34$, 95% CI: 0.18, 0.50) rather than by any of the other insecure attachment subcategories (insecure-avoidant, $d = 0.12$, 95% CI = 0.03, 0.21; insecure-resistant, $d = 0.11$, 95% CI: -0.04, 0.26). Such different effect sizes highlight the relatively weak associations between organized categories of insecurity and externalizing behavioral problems, which echoes both (a) the null effect we obtained here when assessing secure/insecure attachment networks and externalizing behavioral problems, and (b) the significant effect we obtained when assessing the organized/disorganized attachment networks and externalizing behavioral problems (see below).

INSERT FIGURE 2 ABOUT HERE

The Effect of Organized/Disorganized Attachment Network on Externalizing Behavioral Problems: It Takes Only One?

When assessing externalizing behavioral problems on the level of attachment disorganization, the Additive-Hierarchical model was not corroborated, as we initially expected. Rather, we obtained support for the Buffering-Horizontal Model (Dagan & Sagi-Schwartz, 2018, 2020; nonD-nonD = nonD$_M$-D$_F$ = D$_M$-nonD$_F$ < D-D; see Figure 2b). In line with the Buffering hypothesis, it takes one organized attachment to one parent to offset the otherwise unfavorable heightened externalizing behavioral problems that children with two disorganized attachments experience. As in the case of secure/insecure attachment networks and internalizing behavioral problems, here, too, the Horizontal hypothesis was confirmed;

that is, we found no difference in externalizing behavioral problems T scores between children who have organized attachment to mother or father.

These findings extend previous meta-analytic results that indicate a field-specific small to medium effect size (Schuengel et al., 2021) when examining the association between disorganized attachment to one parent and externalizing behavioral problems ($d = 0.34$, 95% CI: 0.18, 0.50; Fearon et al., 2010). Moreover, the findings regarding the null effect of organized/disorganized attachment networks on internalizing behavioral problems are in line with previous meta-analytic results that indicated that disorganized attachment to a single parent was non-significantly associated with internalizing behavioral problems ($d = 0.08$, 95% CI = -0.06, 0.22, Groh et al., 2012; $d = 0.12$, 95% CI = -0.02, 0.23, Madigan et al., 2013).

One potential explanation for the differential association between disorganized attachment network and externalizing and internalizing behavioral problems may be the presence of a confounding factor that is known to be associated with both disorganized attachment and externalizing behavioral problems. Decreased effortful control/self-regulation, for example, was shown to be associated with disorganized attachment when compared to children with organized attachment patterns; $d = 0.34$; Pallini et al., 2018; but see Fearon & Belsky, 2010). Effortful control/self-regulation capacities have also consistently been linked to externalizing behavioral problems in early life (Eisenberg et al., 2009, 2015; Olson et al., 2005), but much less consistently or sometimes even inversely to internalizing behavioral problems (Eisenberg et al., 2009; Hankin et al., 2017; Oldehinkel et al., 2007; Oosterlaan et al., 1998). Other risk factors not assessed here, such as parental hostility and parental psychopathology are also associated with both attachment disorganization in infancy and aggressive behaviors in childhood (Lyons-Ruth, 1996), and may also explain some of the results reported here.

Of note, two of the five studies from which we extracted attachment disorganization classifications used modified SSPs (the PACS and the PAA) that are adapted for assessing preschool children. In these modified SSP assessments, attachment disorganization is classified as either controlling–caregiving or controlling–punitive. These disorganized manifestations are qualitatively different from the manner in which disorganization presents in infancy, and only one of these subtypes (controlling-punitive) has been shown to be associated with externalizing behavioral problems (Bureau et al., 2009; Moss et al., 2004). In this study we collapsed the two disorganized subtypes into one to allow for harmonization of all the disorganized datasets, which potentially affected the differential associations we observed between disorganized attachment networks and externalizing and internalizing behavioral problems.

Study Strengths and Limitations

Given that answers to questions pertaining to early life attachment networks that include child-mother and child-father relationships are often part of labor-intensive observational, and often longitudinal investigations, such studies have been scarce and underpowered. A major strength of the IPD methodology used in the current study is that it allowed us to compile data from across studies to create a larger database of 1,097 families and increased statistical power to answer questions that in most cases were not originally considered. Relatedly, IPD methodology allowed for both synthesis and missing data imputation of behavioral problems outcomes, which together provided us with the opportunity to pool together a dataset that is powerful enough to assess previously unresolved questions regarding the predictive power of attachment networks on the development of internalizing and externalizing behavioral problems.

Alongside the strengths of IPD methodology, some of its essential weaknesses should be noted. Given IPD's reliance on complete and often unpublished datasets, the size of the

pooled dataset is heavily reliant on the researcher's ability and willingness to retrieve and share data, which resulted in some unresolved data accessibility issues. Such potential data loss, together with several older datasets that did not assess attachment disorganization due to the novelty of this coding system at the time when data was coded, lowered statistical power for analysis of attachment network questions in terms of disorganization (e.g., the group of children who were classified as disorganized with both parents was limited to 33).

Given that children assessed in this study mainly come from two-parent traditional households, and that parents in this sample are mostly White and highly educated, the current sample is limited in its generalizability. Thus, future studies on attachment networks will benefit from assessing the questions at hand in both non-traditional families (e.g., same-sex parent families; Golombok, 2015), and in minority and non-Westernized samples, where parent roles may differ (e.g., Chinese families; Chuang et al., 2018). Additionally, children who grow up in unfavorable household environments, such as poverty, abuse and neglect, or where parents have psychopathology or frequent conflicts, tend to experience higher rates of internalizing and externalizing behavioral problems; it is unclear- and thus should be studied in the future- whether a network of secure/organized attachment to both parents in such vulnerable child populations plays a similar promotive factor as in the current normative-risk sample.

Of note, our sample was limited to below clinical cut-offs on internalizing and externalizing behavioral problems T scores; even in the 'worst case scenarios'--where children were insecurely attached to, and/or disorganized with, both mothers and fathers-- they are likely to exhibit a normative range of internalizing and externalizing behavioral problems. Given that by definition we assessed children whose two-parent family structure was intact, and that such households are themselves a protective factor for developing psychopathology (Perales et al., 2017), the observed normative psychopathology T scores are

not surprising. Such psychopathology levels nonetheless limit our ability to generalize our results to more vulnerable and at-risk child populations.

It is worth noting that in this study, we did not assess whether and to what degree the quality of insecure attachment subcategories (i.e., insecure-avoidant and -resistant) might have influenced the observed links between attachment networks and internalizing and externalizing behavioral problems. We also did not assess the potential distinct quality of disorganization attachment's secondary classifications (i.e., disorganized-secure and disorganized-insecure). Whereas such fine-tuned endeavors require a significantly larger sample size, it may be crucial in fine-tuning potential etiological models given the divergent meta-analytic and longitudinal links the two organized insecure attachment subcategories have shown in predicting internalizing and externalizing behavioral problems (Dagan et al., 2021; Dagan & Bernard, 2021).

Methodologically, we used the average of mother and father behavioral problem reports in order to minimize single informant biases; however, sensitivity analyses revealed that not all findings were robust against mother- and father-only reports. Also, whereas our study relied on parent-reported behavioral problems that are often used in observational studies, making our study adherent to standard practice, no non-familial reports were used. Parental reports tend not to converge with non-parental informants' reports (e.g., teacher ratings; Achenbach et al., 1987), and there is currently no clinical gold-standard regarding the child's "true" internalizing and externalizing behavioral problem level (De Los Reyes & Kazdin, 2005). Thus, non-familial informants who may observe the child's behaviors in peer contexts more often than parents can add to the observational context the child's behavioral problems. We therefore encourage future research to incorporate such multiplicity of reporters to increase confidence in the assessment of children's behavioral problems (De Los Reyes et al., 2013).

Finally, whereas the significant pooled dataset results were replicated in the complete-case dataset sensitivity analyses, some of the imputed dataset results were not robust against results based on the complete-case dataset. In fact, a couple of the complete-case dataset results were better aligned with our hypotheses. First, complete-case dataset results showed that secure/insecure attachment networks predicted externalizing behavioral problems. Second, complete-case analysis indicated that organized/disorganized attachment networks predicted externalizing behavioral problems according to the Additive model (i.e., nonD-nonD < nonD-D < D-D). Overall, such discrepancies between the analytic samples call for replication of the results we obtained in our main analyses in larger samples (e.g., reanalysis of current dataset after adding additional accumulated data, and initiation of a multisite longitudinal study that involves assessment of attachment to mothers and fathers).

Conclusion

The idea that the quality of the relationships with both mother and father are crucial to evaluating and understanding the etiology of internalizing and externalizing behavioral problems is by no means new. Nonetheless, our findings add a novel attachment perspective to this notion, suggesting that children's attachment networks are significant in evaluating behavioral problem trajectories, at least in Westernized, normative risk populations.

Whereas future research is needed to evaluate both mechanisms and ecological constraints of the observed links between attachment networks and internalizing and externalizing behavioral problems, findings from the current IPD meta-analysis answer the call to move closer in the direction of understanding the interplay between children's attachment patterns to multiple caregivers which was brought to light almost three decades ago (Van IJzendoorn et al., 1992). Analyzing early attachment as a *network* of attachments - including discordant attachment patterns to mothers and fathers- can indeed be predictive of socioemotional outcomes.

Having two insecure or disorganized attachments within a two-parent attachment network is significantly associated with enhanced risk for elevated internalizing or externalizing behavioral problems, respectively, but only in the case of disorganization with one parent does it appear that the (organized) attachment pattern to the other parent plays a protective role. In any case, regarding the long-lasting question of the different roles that mother-child and father-child attachment relationships play in mental health developmental pathways, the current findings suggest that it may not matter whether the secure attachment is to mother or to father ; at least when it comes to predicting internalizing and externalizing behavioral problems in low-risk, two-parent, same-sex families in Western countries, the quality of attachment patterns to mothers and fathers seems to be equally important.

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Figure 1

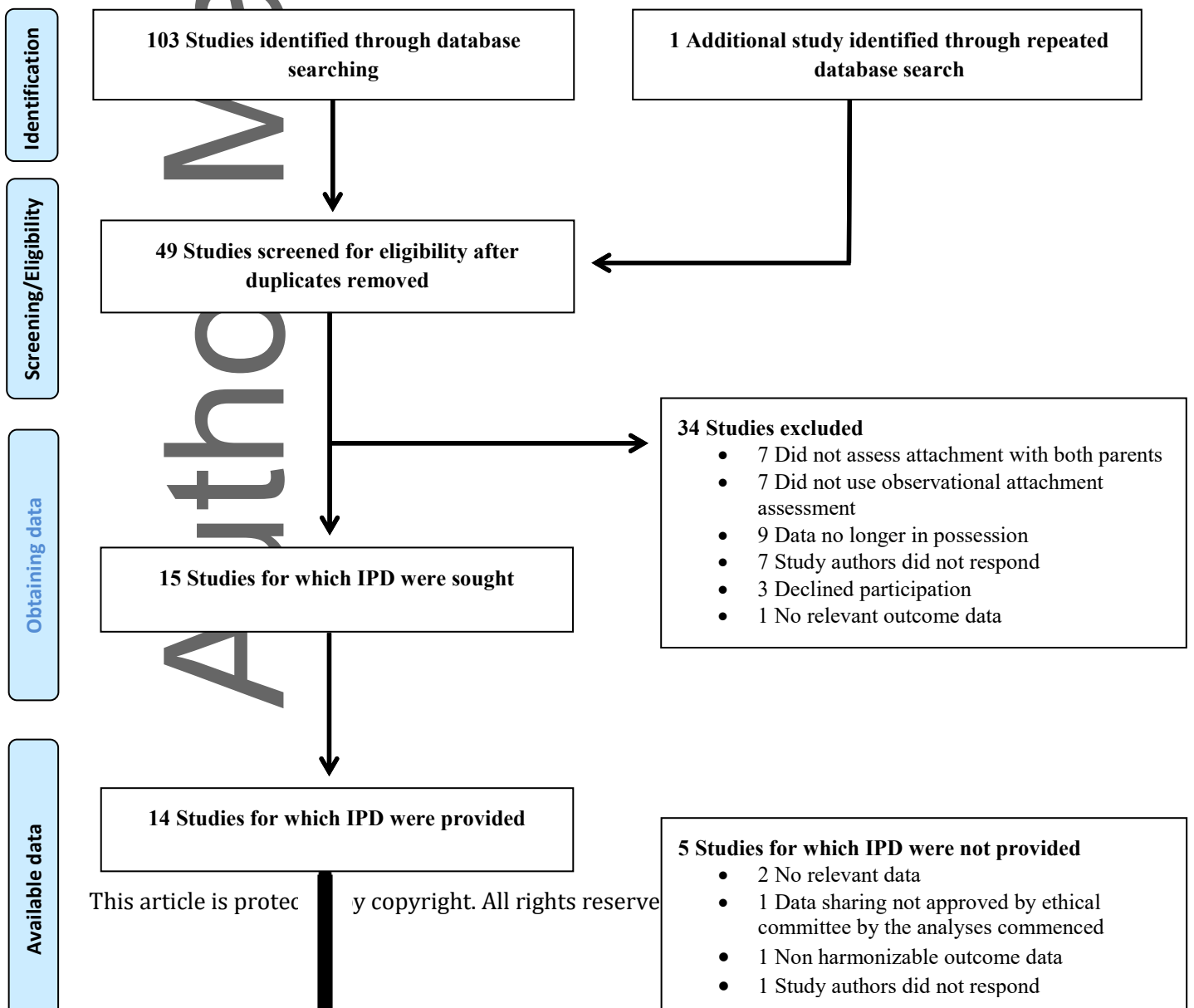*PRISMA-IPD Flowchart of Study Selection and Data Selection Process.*

FIGURE 2 Bar Charts Depicting Differences in Symptoms T Scores Between the Four Integrative (a) Secure/Insecure and (b) Organized/Disorganized Attachment Network Groups

Figure 2

Bar Charts Depicting Differences in Symptoms T Scores Between the Four Integrative (a) Secure/Insecure and (b) Organized/Disorganized Attachment Network Groups.
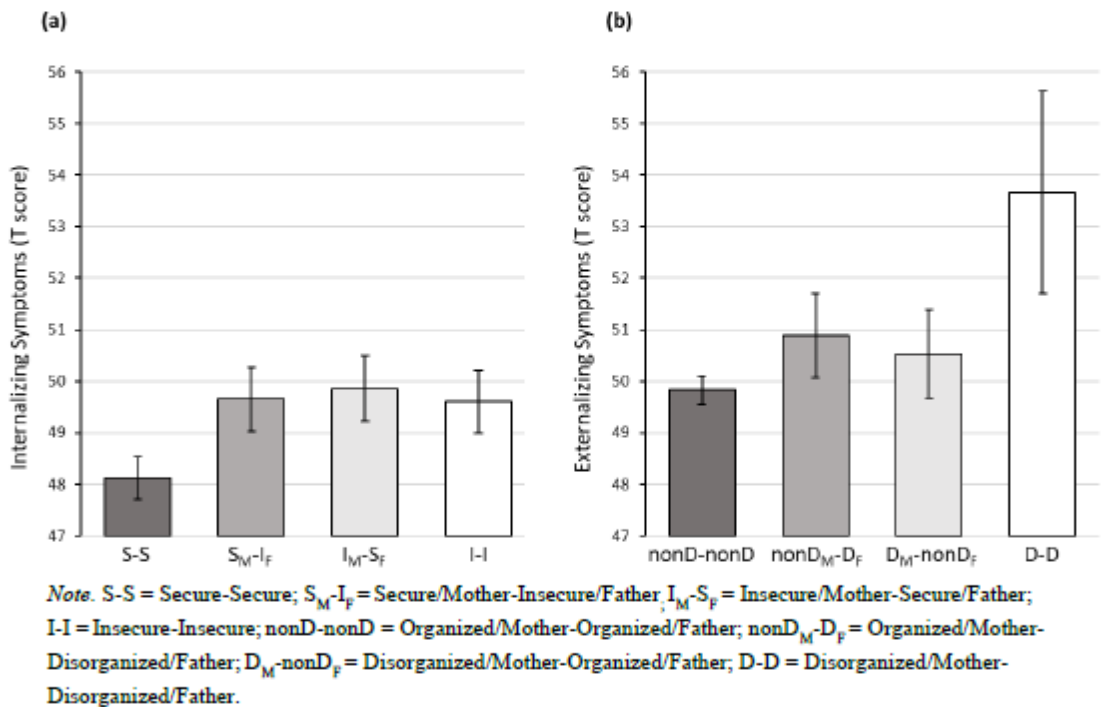
Note. S-S = Secure-Secure; S_M-I_F = Secure/Mother-Insecure/Father; I_M-S_F = Insecure/Mother-Secure/Father; I-I = Insecure-Insecure; nonD-nonD = Organized/Mother-Organized/Father; nonD$_M$-D$_F$ = Organized/Mother-Disorganized/Father; D$_M$-nonD$_F$ = Disorganized/Mother-Organized/Father; D-D = Disorganized/Mother-Disorganized/Father.

Table 1

Model-Based Outcome Predictions for Secure/Insecure Attachment Networks (Based on Dagan & Sagi-Schwartz, 2018).

INTEGRATIVE MODEL	PREDICTION	BRIEF DESCRIPTION
Additive-Hierarchical[†]	$S\text{-}S > S_M\text{-}I_F > I_M\text{-}S_F > I\text{-}I$	Secure attachment to mother (but not father) leads to better outcomes than to both parents, but poorer outcomes than secure attachment to b
Additive-Horizontal	$S\text{-}S > S_M\text{-}I_F = I_M\text{-}S_F > I\text{-}I$	A single secure attachment to either parent leads to better outcomes than to both parents, but poorer outcomes than secure attachment to b
Buffering-Hierarchical[†]	$S\text{-}S = S_M\text{-}I_F > I_M\text{-}S_F > I\text{-}I$	Secure attachment to mother (but not father) leads to as good outcomes to both parents.
Buffering-Horizontal	$S\text{-}S = S_M\text{-}I_F = I_M\text{-}S_F > I\text{-}I$	A single secure attachment to either parent leads to as good outcomes as both parents, all better than insecure attachment to both pa

Note. Given the limitation of space, this table only depicts the different secure/insecure attachment networks. These models apply to organized/disorganized attachment networks. S-S = Secure-Secure; $S_M\text{-}I_F$ = Secure/Mother-Insecure/Father; $I_M\text{-}S_F$ = Insecure/Mother-Secure/Father; I-I = Insecure-Insecure. [†]It is possible in principle that the parental hierarchy is such that secure attachment only to father leads to better outcomes than secure attachment only to mother.

Table 2

Pooled Dataset Internalizing and Externalizing Behavioral Problems T Scores per Attachment

Network Group.

	S-S		S_M-I_F		I_M-S_F		I-I		nonD-nonD		$nonD_M$-D_F	
n	472		195		220		210		746		84	
Outcome /Informant	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Internalizing Behavioral Problems												
Mother	47.94	10.92	49.55	9.63	49.98	10.79	50.07	10.58	48.73	10.34	46.43	9.56
Father	48.30	9.95	49.76	10.63	49.74	11.12	49.13	49.10	48.39	9.83	49.31	10.71
Mother/Father	48.12	8.97	49.65	8.54	49.86	9.46	49.6	8.84	48.58	8.65	47.87	8.26
Externalizing Behavioral Problems												
Mother	50.02	9.55	51.08	8.76	49.74	9.37	52.6	11.23	50.44	9.02	50.42	8.84
Father	49.18	8.84	49.99	9.05	49.35	9.38	50.59	10.79	49.22	8.77	51.36	9.74
Mother/Father	49.60	7.85	50.54	7.47	49.54	7.80	51.59	9.87	49.83	7.54	50.89	7.54

Note. S-S = Secure-Secure; S_M-I_F = Secure/Mother-Insecure/Father; I_M-S_F = Insecure/Mother-Secure/Father; I-I = Insecure-Insecure; nonD-nonD = Organized/Mother-Organized/Father; $nonD_M$-D_F = Organized/Mother-Disorganized/Father; D_M-$nonD_F$ = Disorganized/Mother-Organized/Father; D-D = Disorganized/Mother-Disorganized/Father.

Table 3

Planned Comparisons for Research Question 1: Is the Number of Insecure or Disorganized Attachments Important in Predicting Internalizing and Externalizing Behavioral Problems?

| | COMPLETE-CASE DATASET | | | | | | IMPUTED DATASET | | | | | |
| | I-I vs. S-I/S-S | | | S-I vs. I-I | | | I-I vs. S-I/S-S | | | S-I vs. I-I | | |
Outcome /Informant	df	t	p	df	t	p	df	t	p	df	t	p
Internalizing Behavioral Problems												
Mother	773	0.48	0.63	774	-2.23	0.03	1092	0.51	0.61	1093	-2.53	0.01
Father	762	-0.19	0.85	763	-1.94	0.05	1092	-0.92	0.36	1095	2.12	0.04
Mother/Father	754	0.35	0.72	754	-2.38	0.02	1092	-0.25	0.81	1093	-2.77	0.006
Externalizing Behavioral Problems												
Mother	783	2.34	0.02	784	-1.28	0.20	1095	2.07	0.04	1104	-0.68	0.49
Father	755	1.44	0.15	756	-0.99	0.32	1093	0.66	0.51	1100	-0.99	0.32
Mother/Father	755	2.34	0.02	756	-1.12	0.27	1090	1.63	0.10	1099	-.098	0.33
	D-D vs. nonD-D/nD-nonD			nonD-D vs. nonD-nonD			D-D vs. nonD-D/nonD-nonD			nonD-D vs. nonD-nonD		
Internalizing Behavioral Problems												
Mother	790	-1.04	0.30	791	0.94	0.35	945	-0.74	0.46	949	1.39	0.16
Father	731	-1.56	0.12	732	-2.21	0.03	950	-1.64	0.10	955	-1.52	0.13
Mother/Father	724	-1.58	0.12	725	-0.93	0.35	949	-1.43	0.15	953	-0.03	0.97
Externalizing Behavioral Problems												
Mother	797	2.18	0.03	787	-1.12	0.26	959	2.08	0.04	950	-0.34	0.74
Father	738	1.88	0.06	731	-2.05	0.01	955	1.49	0.14	960	-2.38	0.02
Mother/Father	730	2.39	0.02	729	-2.19	0.03	956	2.18	0.03	959	-1.59	0.11

Note. S-S = Secure-Secure; S-I = Secure-Insecure; I-I = Insecure-Insecure; nonD-nonD = Organized-Organized; nonD-D = Organized/Disorganized; D-D = Disorganized-Disorganized.

Table 4

Planned Comparisons for Research Question 2: Does the Quality of Attachment to One Caregiver Predict Internalizing and Externalizing Behavioral Problems Better Than to the Other?

Outcome /Informant	COMPLETE-CASE DATASET			IMPUTED DATASET		
	S_M-I_F vs. I_M-S_F			S_M-I_F vs. I_M-S_F		
	df	t	p	df	t	p
Internalizing Behavioral Problems						
Mother	296	-0.26	0.79	380	-0.29	0.77
Father	291	0.05	0.96	377	-0.11	0.91
Mother/Father	287	0.03	0.97	377	-0.24	0.81
Externalizing Behavioral Problems						
Mother	300	1.36	0.18	384	1.63	0.10
Father	324	0.33	0.74	380	1.00	0.32
Mother/Father	290	1.49	0.14	383	1.59	0.11
	$nonD_M D_F$ vs. D_M-$nonD_F$			$nonD_M D_F$ vs. D_M-$nonD_F$		
Internalizing Behavioral Problems						
Mother	149	0.33	0.75	177	0.88	0.38
Father	136	0.16	0.87	178	0.10	0.92
Mother/Father	134	0.57	0.57	176	0.44	0.66
Externalizing Behavioral Problems						
Mother	148	0.08	0.93	174	0.01	0.94
Father	138	-0.28	0.78	179	-0.67	0.49
Mother/Father	137	-0.06	0.95	179	-0.46	0.64

Note. S_M-I_F = Secure/Mother-Insecure/Father; I_M-S_F = Insecure/Mother-Secure/Father; $nonD_M$-D_F = Organized/Mother-Disorganized/Father; D_M-$nonD_F$ = Disorganized/Mother-Organized/Father.

Table 5

Outcome /Informant	COMPLETE-CASE DATASET												IMPUT
	I-I vs. S_M-I_F/I_M-S_F /S-S			S_M-I_F/I_M-S_F vs. S-S			S_M-I_F vs. I_M-S_F			I-I vs. S_M-I_F/I_M-S_F /S-S			S_M-I_F/
	df	t	p	df	t	p	df	t	p	df	t	p	df
Internalizing Behavioral Problems													
Mother	774	0.14	0.87	775	-2.24	0.03	775	-0.15	0.88	1093	0.14	0.89	1093
Father	763	-0.47	0.64	764	-1.94	0.05	763	-0.17	0.87	1093	-1.22	0.22	1095
Mother/Father	755	0.00	1.00	755	-2.38	0.02	755	-0.14	0.89	1093	-0.64	0.52	1094
Externalizing Behavioral Problems													
Mother	784	2.12	0.03	785	-1.27	0.20	785	1.37	0.17	1097	1.92	0.06	1105
Father	756	1.27	0.20	757	-0.99	0.32	756	0.51	0.61	1094	0.49	0.62	1101

Mother/Father	756	2.14	0.03	758	-1.10	0.27	756	1.30	0.19	1092	1.44	0.15	1100
	D-D vs. nonD$_M$-D$_F$/D$_M$-nonD$_F$ /nonD-nonD			nonD$_M$-D$_F$/D$_M$-nonD$_F$ vs. nonD-nonD			nonD$_M$-D$_F$ vs. D$_M$-nonD$_F$			D-D vs. nonD$_M$-D$_F$/D$_M$-nonD$_F$ /nonD-nonD			nonD$_M$- vs. r
Internalizing Behavioral Problems													
Mother	789	-0.92	0.36	792	0.92	0.35	790	-0.29	0.77	950	-0.60	0.55	953
Father	732	-1.72	0.08	734	-2.17	0.03	735	-0.21	0.83	951	-1.73	0.08	957
Mother/Father	725	-1.61	0.11	726	-0.92	0.35	727	-0.67	0.51	950	-1.39	0.16	954
Externalizing Behavioral Problems													
Mother	798	2.07	0.04	786	-1.02	0.31	799	-0.01	0.99	959	2.08	0.04	937
Father	729	1.62	0.11	735	-2.45	0.01	733	0.23	0.82	950	1.22	0.22	957
Mother/Father	718	2.17	0.03	730	-2.06	0.04	727	0.09	0.93	949	1.95	0.05	964

Planned Comparisons for Research Question 3: Which Integrative Model Best Predicts Behavioral

Problems Outcomes?

Note. S-S = Secure-Secure; S$_M$-I$_F$ = Secure/Mother-Insecure/Father; I$_M$-S$_F$ = Insecure/Mother-Secure/Father; I-I = Insecure-Insecure; nonD-nonD = Organized/Mother-Organized/Father; nonD$_M$-D$_F$ = Organized/Mother-Disorganized/Father; D$_M$-nonD$_F$ = Disorganized/Mother-Organized/Father; D-D = Disorganized/Mother-Disorganized/Father.