

Abstract

Meta-analytic associations between observed parental sensitivity and child behavioral problems were examined (children aged 0-17 years). Studies ($k = 108$, $N = 28,114$) contained sociodemographically diverse samples, primarily from North America and Europe, reporting on parent-child dyads (95% mothers; 54% boys). Sensitivity significantly related to internalizing ($k = 69$ studies; $N = 14,729$; $r = -.08$, 95% CI [-.12, -.05]) and externalizing ($k = 94$; $N = 25,418$; $r = -.14$, 95% CI [-.17, -.11]) problems, with stronger associations found for externalizing. For internalizing problems, associations were significantly stronger among samples with low socioeconomic status versus mid-high socioeconomic status, in peer-reviewed versus unpublished dissertations, and in studies using composite versus single scale sensitivity measures. No other moderators emerged as significant.

Key words: parent-child, sensitivity, responsiveness, meta-analysis, internalizing, externalizing

Parental Sensitivity and Child Behavioral Problems: A Meta-Analytic Review

The quality of caregiving a child receives plays a foundational role in children's socioemotional development. In particular, positive aspects of caregiving, including sensitivity and responsiveness to children's cues, signals, and bids, are associated with child attachment security (Ainsworth, Bell, & Stayton, 1974; De Wolff & van IJzendoorn, 1997; Lucassen et al., 2011; Zeegers, Colomnesi, Stams, & Meins, 2017), executive functioning skills (Rodrigues et al., 2021; Valcan, Davis, & Pino-Pasternak, 2018), language acquisition (Madigan et al., 2019; Rodrigues et al., 2021), academic achievement (Raby, Roisman, Fraley, & Simpson, 2015), and social functioning (Raby et al., 2015). Emerging studies also suggest that sensitive parenting plays a role in children's physiological regulation of stress (Hostinar, Sullivan, & Gunnar, 2014). In contrast, insensitive parenting experiences have been linked with an increased risk of developing internalizing (Kok et al., 2013; van der Voort et al., 2014) and externalizing problems (Rodrigues et al., 2021; Windhorst et al., 2015) in childhood. Accordingly, myriad interventions have been developed that aim to improve caregiving behavior in order to reduce children's risk for psychopathology (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003).

Despite the rapid uptake and dissemination of interventions with a focus on enhancing positive parenting, questions remain with regard to the consistency of associations between parental sensitivity and child behavioral concerns. Specifically, studies report associations of varying magnitude between parental sensitivity and children's internalizing and externalizing problems (e.g., Benton, Coatsworth, & Biringen, 2019; Easterbrooks, Bureau, & Lyons-Ruth, 2012; Sturge-Apple, Davies, Cicchetti, & Manning, 2010; Zimmer-Gembeck et al., 2013), emphasizing a need to investigate potential explanations for discrepancies across the literature (i.e., when and for whom associations are stronger or weaker). At an individual-level, single

studies have suggested moderators, such as parent gender (Zvara, Sheppard, & Cox, 2018) and family socioeconomic status (Mesman, van Ijzendoorn, & Bakermans-Kranenburg, 2012), may account for variability among studies. In order to quantitatively test sources of between-study variation in the research amassed to date, a meta-analysis is needed. Thus, the current study aimed to synthesize studies examining the associations between observations of parental sensitivity and child internalizing and externalizing problems via meta-analysis, to estimate the average magnitude of the association and its statistical reliability and heterogeneity, and to clarify whether moderators explain any such heterogeneity between studies.

Parental Sensitivity: Theory and Measurement

Definitions of parental sensitivity are strongly rooted in the theoretical and empirical contributions of attachment pioneer, Mary Ainsworth, who defined sensitive caregiving as a parent's ability to identify, interpret, and contingently respond to their infant's behavioral, verbal, and emotional cues promptly and appropriately (Ainsworth et al., 1974). As sensitivity exists on a continuum from highly sensitive to highly insensitive, parental sensitivity is used hereafter in regard to its association with child behavior problems. Since its conception, this definition of parental sensitivity has formed the basis of numerous observational measures (Mesman & Emmen, 2013) and although questionnaire measures of parental sensitivity have also been developed, it has been contended that parents' self-reports of their ability to identify and interpret their children's cues may be biased, especially if they experience mental illness or lack insight into the meaning of their children's behavior (Schwarz, 1999). Further, the appropriateness and timeliness of a parents' contingent responding may be difficult to ascertain in the absence of direct observations of children's behavior (Smith, 2011). For these reasons, only observational measures of sensitivity were included in this meta-analytic review.

Observational measures of parental sensitivity have been adapted to incorporate broader aspects of caregiving (e.g., responsiveness), and for expanded use with older age groups. Criterion validity has been supported for these adapted instruments in relation to child attachment security, consistent with original conceptualizations of sensitivity based in attachment theory (Mesman & Emmen, 2013). Similarly, while the majority of observational sensitivity measures were initially developed and validated in samples of mother-child dyads, growing attention has been dedicated to exploring the construct of paternal sensitivity in relation to child outcomes, given the increasing primary caregiving role of fathers over the past several decades (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000). Indeed, meta-analyses have supported the construct validity of paternal sensitivity, even when measured with traditional sensitivity instruments, in relation to child attachment security (Lucassen et al., 2011), cognitive, language, and emotional development (Rodrigues et al., 2021), and externalizing problems (Rodrigues et al., 2021). Relatedly, parental sensitivity is theorized to be most impactful on later child wellbeing when provided in early childhood. However, several investigations have identified support for the role of paternal sensitivity in middle childhood (Zvara et al., 2018) and maternal sensitivity in adolescence (Mesman & Emmen, 2013) in predicting child adjustment, positive social outcomes, and reduced allostatic load. Thus, adapted observational measures of maternal and paternal sensitivity were considered for inclusion, and parent gender and child age were also included as moderators.

Child Internalizing and Externalizing Behaviors

Child behavior problems are most often examined under two broad-spectrum dimensions, internalizing problems and externalizing problems. Internalizing problems include difficulties within the self that are less readily observable (i.e., anxiety, depression, social withdrawal, and

somatic symptoms), whereas externalizing problems include more observable behaviors, such as conflict with others (e.g., aggression, rule-breaking) and behavioral dysregulation (e.g., hyperactivity; Achenbach, 2020). Although there is considerable evidence for the shared variance between internalizing and externalizing problems, studies frequently support a two-factor model of psychopathology that demonstrates validity with external criterion (Smith, Atkinson, Davis, Riley, & Oltmanns, 2020). Moreover, theory and some empirical evidence suggests partially distinct causal influences on internalizing and externalizing problems (Cosgrove et al., 2011). Therefore, differential associations between parental sensitivity and both internalizing and externalizing problems were explored.

Parental Sensitivity and Child Internalizing and Externalizing Behaviors

In consideration of why parental sensitivity may reduce the risk for the development of children's general psychological risk, emotion socialization (Eisenberg, Cumberland, & Spinrad, 1998) and social learning frameworks (Grusec, 1994) suggest the ways in which parents respond to their children's emotional expressions and model emotional expression and regulation are critical influences on the development of emotional competencies and cognitive-affective representations of the self and others, and social behaviors. Attachment theory (Bowlby, 1982) proposes children with insecure attachment patterns internalize maladaptive cognitive-affective schemas, or internal working models (e.g., perceptions the self as worthy of care and love, others as trustworthy), of the self, others, and world, based on the unreliable and inconsistent responses of their caregivers, whereas children with secure attachment patterns may internalize adaptive internal working models due to the sensitive patterns of responses provided by their caregivers. In turn, maladaptive internal working models are thought to contribute to the development of internalizing and externalizing problems, while adaptive internal working models are considered

to be protective against these concerns (Fearon, Groh, Bakermans-Kranenburg, van IJzendoorn, & Roisman, 2016).

Specific to internalizing problems, researchers have proposed the relation between parental sensitivity and subsequent adaptive schemas of the self, others, and world may be protective against the onset of depressive and anxiety difficulties in children. In contrast, parental over-responsiveness, or overprotectiveness, may impede the development of healthy autonomy-seeking and internal locus of control, thereby contributing to children's perceived helplessness and avoidance of anxiety stimuli (McLeod, Weisz, & Wood, 2007; McLeod, Wood, & Weisz, 2007; Piquart, 2017b). The provision of infrequent, inappropriate, or absent parental responses to emotional cues may also signal to children that they are unworthy of care, must cope with emotions on their own, or that their emotional experiences and expressions are inappropriate. In turn, children with insensitive parenting experiences may develop poor self-esteem, negative self-schemas, and avoidant coping strategies (e.g., minimization of affective expressions) that underlie internalizing difficulties. Some researchers have further posited children's internalizing symptoms may elicit greater parental insensitivity and overcontrol, thus consolidating their association over time (Kok et al., 2013; van der Voort et al., 2014).

Concerning externalizing problems, parenting has been suggested to play a more critical role in the development and maintenance of oppositionality, aggression, and conduct problems. From a social learning perspective (Grusec, 1994), insensitive parents may model harsh, withdrawn, or rejecting behaviors to their children in response to normative emotional cues (e.g., crying), certain temperamental traits (e.g., poor inhibitory control), or when punishing misbehavior. According to attachment theory, insensitive parenting characterized by inconsistent, harsh, and unreliable responses may contribute to mental representations of others

as unreliable and hostile and, therefore, increase the propensity for aggressive and antisocial behaviors in later childhood and adolescence (Fearon et al., 2016). Finally, a recent meta-analysis of indicated positive parenting (e.g., warmth, responsiveness) was associated with children's better global executive functioning ($k = 41$), inhibition ($k = 11$), shifting ($k = 7$), and working memory ($k = 7$; Valcan et al., 2018). Enhanced executive functioning may underlie children's adaptive self-regulation skills and subsequent reduced risk for externalizing problems.

Individual studies on parental sensitivity report considerable variability regarding the significance of associations with internalizing and externalizing problems. For example, studies have found parental sensitivity is not significantly associated with internalizing or externalizing problems (e.g., Benton et al., 2019), is significantly associated with externalizing but not internalizing problems (e.g., Easterbrooks et al., 2012), is significantly associated with internalizing but not externalizing problems (e.g., Zimmer-Gembeck et al., 2013), or is significantly related to both (e.g., Sturge-Apple et al., 2010). A number of meta-analyses have also examined child behavior problems in relation to broader constructs of positive parenting, identifying significant associations between parental warmth or synchrony and children's reduced risk for externalizing problems ($r = -.18$ to $-.25$; Pinquart, 2017a; Rothbaum & Weisz, 1994), internalizing problems ($k = 1,015$; $r = -.20$; Pinquart, 2017b), depression ($r = -.24$ to $-.28$; McLeod, Weisz, et al., 2007; Pinquart, 2017b), and anxiety ($r = -.06$ to $-.13$; McLeod, Wood, et al., 2007; Pinquart, 2017b). However, these meta-analyses are limited in their ability to provide precise estimates between observed parental sensitivity and child behavior problems, or particular sources of between-study variation specific to this association, given the prior meta-analyses included broader definitions of responsiveness (e.g., support, acceptance) and questionnaire measures of parenting constructs.

Potential Moderators of Parental Sensitivity and Child Behavior Problems

Several potential moderators were investigated to explain between-study heterogeneity in the existing literature.

Parent gender. Although both maternal and paternal sensitivity have been hypothesized to reduce the risk of offspring behavioral problems, relatively fewer studies have been conducted with fathers than mothers. In addition, a limited number of studies have comparatively examined the relation of both maternal and paternal sensitivity with child behavior problems. Zvara et al. (2018) found significant associations for both parent genders with children's externalizing, but not internalizing, problems in middle childhood and adolescence. A recent meta-analysis examined the association between paternal sensitivity with child socioemotional outcomes and found fathers' responsivity demonstrated small and significant associations with children's externalizing problems, but non-significant relations with children's internalizing problems (Rodrigues et al., 2021). However, it is unclear if this pattern holds among mother-child dyads. Thus, it is important to investigate parent gender as a moderator to determine if it clarifies discrepancies among associations between parental sensitivity and child behavior problems.

Parenting status. While children in foster or adoptive families may be at an increased risk for behavior problems due to early experiences of separation and loss from their biological parents, studies suggest foster or adoptive parent sensitivity may be protective against adverse developmental outcomes when provided in early and middle childhood (van der Voort et al., 2014). Studies of foster and adoptive families also help elucidate the extent to which the association between parental sensitivity and child behavior problems is related to environmental influences, rather than shared genetics. Consequently, this study examined whether associations varied by the biological versus adoptive or foster parenting status of caregivers.

Child sex. Sex differences are commonly found for children's risk for psychopathology, with boys typically identified at greater risk for externalizing problems, while girls are generally reported to have a higher chance of internalizing problems, particularly for depression in adolescence (Zahn-Waxler, Shirtcliff, & Marceau, 2008). However, there is mixed evidence regarding the role of sex differences on the relation between parenting and child behavior problems. For example, in a separate examination of depression and anxiety, associations with parental warmth were not moderated by child sex (McLeod, Weisz, et al., 2007; McLeod, Wood, et al., 2007). Conversely, Piquart (2017b) found effect sizes between parental warmth and internalizing problems were strongest in samples with a greater proportion of girls. A meta-analysis investigating the relation between fathers' responsiveness and children's behavior problems found no moderation by child sex (Rodrigues et al., 2021). Still, some individual studies find variation for male and female children. For example, Zvara et al. (2018) identified distinct longitudinal patterns between parental sensitivity and child behavior problems for father-son dyads and mother-daughter dyads. Therefore, the magnitude of the association between parental sensitivity and child behavior problems may vary as a function of child sex.

Child age. Some researchers have proposed parental sensitivity may be most protective against the development of behavior problems in early childhood, when parents are the primary socialization agents for their children and serve as important buffers of social stress (Hostinar et al., 2014). However, parental insensitivity may also serve as a key source of distress in adolescence, when teenagers are increasingly sensitive to social stressors and demonstrate an underdeveloped capacity to engage in top-down regulatory mechanisms to mitigate physiological and emotional reactivity (Miller & Prinstein, 2019). Moreover, studies suggest parental sensitivity and child behavior problems may reciprocally consolidate one another over time,

which could lead to stronger associations as children age. Interestingly, Rodrigues et al. (2021) found associations between paternal responsiveness and children's behavior problems were moderated by age, with stronger effect sizes found in samples of older children. This study examined whether a similar pattern of findings emerged when investigating child age as a moderator of the association between parental sensitivity and child behavior problems.

Race, ethnicity, socioeconomic status, and geographic region. Studies suggest parents from minoritized racial and ethnic groups demonstrate less sensitivity in comparison to parents from non-minoritized groups (for review, see Mesman et al., 2012). Some researchers have posited the reason for this discrepancy is due to normative cultural differences in parenting practices and beliefs. However, others have argued the intersection of race and ethnicity with low socioeconomic status (SES), and their associated stressors, accounts for these findings (Mesman et al., 2012). Specifically, families with economic strain may experience higher levels of stress that contribute to the development of parents' psychological distress and subsequent parenting difficulties. Parents with low incomes may also be unable to dedicate significant time and finances toward child stimulation, support, and learning, given they may need to invest their resources toward more immediate concerns (e.g., food security; Becker & Becker, 2009). In the current study, we investigate the effects of race and ethnicity, SES, and geographical region of the study (as a proxy for nationality), as potential moderators.

Measurement characteristics. In regard to the measurement of parenting, associations may differ based on narrow versus broad definitions of sensitivity. For example, De Wolff and van Ijzendoorn (1997) reported marginally larger effect sizes between maternal sensitivity and child attachment security for narrower definitions of sensitivity. The coding system used to assess sensitivity may thus be a moderator of this association. In contrast, Rothbaum and Weisz

(1994) found the association between positive parenting and child externalizing problems was nearly doubled when four or more aspects of parenting were included in broader composite scores, compared to narrower measures of parenting. The type (i.e., free-play, naturalistic, or structured) and location (i.e., home vs. laboratory) of the sensitivity paradigm could also contribute to between-study variation due to the potential for particular structured paradigms to elicit greater distress from children which may evoke greater parental sensitivity, and the potential effects on the ecological validity of the paradigm, respectively. Specific to the measurement of child behavior problems, the informant and type of behavior problems measure may increase heterogeneity, considering questionnaire parent- and self-reports are susceptible to reporting biases (De Los Reyes, Henry, Tolan, & Wakschlag, 2009). Study design (i.e., cross-sectional versus longitudinal designs) may also play a moderating role, as several studies have provided evidence for the consolidation and exacerbation of parental sensitivity and child behavior problems over time (Kok et al., 2013; Scott, Nelson, & Dix, 2018; Zvara et al., 2018).

The Current Study

Numerous studies have examined the association of parenting sensitivity and children's behavior problems. However, these studies have not been quantitatively synthesized to examine potential factors that may explain the considerable between-study variability identified in the literature. In addition, although one meta-analysis has examined the association between paternal responsiveness and child internalizing and externalizing problems (Rodrigues et al., 2021), no study to date has summarized findings on all parents' observed sensitivity in relation to children's internalizing and externalizing problems. Therefore, the primary objective of this study was to conduct a meta-analytic review of empirical work examining the associations between parents' sensitive responding and children's internalizing and externalizing problems. Given the noted

concerns with utilizing self-reports of parental sensitivity (Schwarz, 1999; Smith, 2011), this meta-analysis only included studies that assessed parental sensitivity with observational measures. It was hypothesized parental sensitivity would demonstrate significant associations with children's internalizing and externalizing problems, and analyses examining these associations were confirmatory in nature.

A secondary objective was to identify moderators of the association between parental sensitivity and child behavior problems to explain when and for whom these relations may be amplified or attenuated. Potential moderators included parent gender, parenting status (i.e., biological vs. adoptive or foster parents), child age, child sex, race and ethnicity, socioeconomic status, geographical region, and measurement characteristics (i.e., single vs. composite measures of sensitivity; type of assessment, coding system, and location of sensitivity measure; behavior problems measure informant; type of behavior problems measure; study design). We also examine publication status as a moderator, as unpublished studies are more likely to have methodological errors than unpublished studies which could artificially inflate effect sizes (Ferguson & Brannick, 2012). Specific hypotheses were not made for the moderator analyses, due to the lack of consistency in the existing literature regarding the role of these variables. Thus, moderator analyses were exploratory in nature.

Method

Definitional Criteria

Parental sensitivity was defined as a parent's ability to notice and correctly interpret their child's signals or needs, and provide contingent, appropriate and consistent responses to these signals or needs (Ainsworth et al., 1974). The present study included any observational measure of sensitive parenting. Constructs that have been used synonymously and/or in combination with

sensitivity, such as responsiveness, were also included. To maintain consistency with other meta-analyses on parent sensitivity and child outcomes (e.g., Madigan et al., 2019; Rodrigues et al., 2021), single rating measures of sensitivity, as well as derived sensitivity composites (i.e., sensitivity + warmth), were included. *Child behavior problems* were defined according to broadband definitions and included internalizing and externalizing problems (Achenbach, 2020). *Internalizing problems* encompassed depression, anxiety, somatization, and withdrawal symptoms. *Externalizing problems* included inattention, impulsivity, hyperactivity, oppositionality, aggression, and conduct difficulties.

Search Strategy

The protocol for this study was pre-registered with PROSPERO (# removed to retain anonymity). Electronic searches were conducted by a science librarian in MEDLINE, Embase, and PsycINFO to identify published and unpublished studies between 1969 and November 2019. Both database-specific subject headings and text word fields were searched with variations of the terms *sensitive-responsiveness* (e.g., *sensitiv**, *responsiv**), *parents* (e.g., *maternal**, *father**), *children* (e.g., *infan**, *adolescen**), *internalizing* (e.g., *anxiety**, *internaliz**), and *externalizing* (e.g., *aggression**, *externaliz**; see Supplemental Table 1). Synonymous terms were first combined with the Boolean “OR”. These four concepts were then combined with the Boolean “AND”. In all databases, truncation symbols were used in text word searches when appropriate to capture variations in spelling and phrasing (see Supplementary Table 1 for full search strategy). No language restrictions were applied. The search strategy identified 10,763 non-duplicate titles and abstracts (see Figure 1 for PRISMA diagram).

[insert Figure 1 here]

Study Inclusion and Exclusion Criteria

Studies were included if they met the following criteria: (1) a sample of children under the age of 18 years; (2) an observational measure of parental sensitivity; (3) a measure of child behavior problems; (4) data that could be transformed into an effect size; and (5) the full text article was available in English. Studies were excluded for the following reasons: (1) parental sensitivity was measured longitudinally after the assessment of child behavior problems; (2) samples comprised participants with neurocognitive or medical conditions (e.g., autism spectrum disorder, traumatic brain injury); and (3) associations between parental sensitivity and child behavior problems were reported as part of an intervention and only post-intervention associations were provided (note that baseline associations were used, if provided).

A standard meta-analytic training procedure with mock abstract review was used to train all coders prior to their participation in the current review. All raters had to reach agreement on > 90% of all training abstract reviews prior to participating in this study. All titles and abstracts for the current meta-analysis were reviewed by at least two trained coders and any discrepancies were resolved to consensus via consultation. Seven hundred and eighty studies met full inclusion criteria and three independent coders (removed to retain anonymity) reviewed all full-text files, upon which 672 studies were excluded, and 108 studies underwent full data extraction.

Data Extraction

A standard data extraction coding protocol and form was used to extract all variables of interest. Three independent coders (removed to retain anonymity) extracted a unique set of studies. Approximately 20% of studies were double coded by a trained research assistant. Reliability across the measures on average was high ($ICC \geq 0.99$). Any discrepancies were resolved to consensus via consultation.

Moderators. The following continuous moderators were extracted from each study: (1)

parent gender (% mothers); (2) child sex (% male); (3) child age (in months) at the time of parental sensitivity and behavior problems assessments; (4) proportion of sample from a minoritized racial or ethnic group (% minoritized); (5) duration of the sensitivity assessment (in minutes). The following categorical moderators were extracted from each study: (1) sample socioeconomic status (sample with high [$> 80\%$] proportion of participants from low income versus middle-to-high income backgrounds); (2) type of sensitivity paradigm (free-play, naturalistic, or structured); (3) location of the sensitivity paradigm (home or laboratory); (4) coding system (Ainsworth-Erickson system, Emotional Availability Scales, CARE-Index, HOME, MBQS, NICHD); (5) sensitivity composite or single scale; (6) type of behavior problem measure (interview, observational, questionnaire, or multiple types); (7) informant of behavioral problem (child, parent, teacher and other observer, or multiple sources); (8) study design (cross-sectional, longitudinal, or both); (9) publication status (dissertation or peer-reviewed article); (10) parenting status (biological or adoptive and foster parents); and (11) geographical region (continent). Consistent with prior meta-analyses, continuous moderators were examined when four or more samples were available per outcome and categorical moderators were explored when four or more samples were available per cell (Bakermans-Kranenburg et al., 2003). For geographical region, only North America and Europe had sufficient cell sizes to be considered. While there were five studies from other geographical regions (i.e., Asia, Middle East, South America) for externalizing problems, it would be reductionist of cultural differences to combine across these regions to create a comparison category.

Data Synthesis

A standard protocol with a hierarchical series of decisions was followed to ensure independence of effect sizes (see Supplemental Table 2 for further detail). First, studies were

cross-referenced to identify potential sample overlap. Second, when a sample was represented in both a published and unpublished study, data was retained from the published, peer-reviewed study because unpublished studies are more likely to have methodological errors (Ferguson & Brannick, 2012). Third, if the same sample was represented across multiple publications, data from the publication with the largest sample size was extracted. Fourth, when studies provided data at multiple time points, effect sizes for sensitivity and behavior problems were pooled across time points to obtain a single effect size that was representative of the sample. Fifth, effect sizes were also pooled when studies provided distinct effect sizes for multiple measures or subscales of sensitivity (e.g., NICHD scales and MBQS; verbal and emotional responsiveness) or behavior problems (e.g., CBCL and ITSEA; hyperactivity and oppositionality). Effect sizes were pooled using the R package *metafor* (Viechtbauer, 2010).

Data Analysis

All effect sizes were transformed into Pearson's correlations (r). Standard formulas allowed for the transformation of p -values, group differences, odd ratios, and regression coefficients (Borenstein, Hedges, Higgins, & Rothstein, 2021). If studies reported a non-significant finding without a specific effect size, the effect size was computed based on a two-sided p value of .50. Two meta-analyses were conducted, one to examine the association of parental sensitivity with externalizing problems, and one with internalizing problems. Random effects meta-analyses were conducted in R using the *metafor* package (Viechtbauer, 2010). Random effects models were selected to adjust for individual study population parameters and accurately capture between-study variation commonly identified in observational studies (Russo, 2007). In order to reduce variability depending on the magnitude of correlations, correlations were first converted to Fisher's z for the analyses (Borenstein et al., 2021). Pooled effect sizes

were transformed back to correlations for presentation of the results. Correlations of .10, .20, and .30 were respectively interpreted as small, medium, and large in magnitude, consistent with calibrated effect size guidelines for psychological research (Funder & Ozer, 2019), and presented with corresponding 95% confidence intervals (CI).

Publication bias was evaluated using the Egger test and an examination of the funnel plots. Heterogeneity was assessed using Q and I^2 statistics. Moderators were considered if the Q statistic was significant or if the I^2 statistic indicated more than 50% heterogeneity. A multilevel approach was used to compare the magnitude of effect sizes for externalizing and internalizing behaviors. The approach was deemed appropriate because many studies reported on both externalizing and internalizing problems, thereby providing dependent effect sizes for these analyses. The multilevel meta-analysis was conducted in R using the *robumeta* package, and the test of moderators using the Wald test of the *clubSandwich* package.

Results

Study Characteristics

Supplemental Table 3 provides a summary of all study characteristics. In total, 108 studies reported an association between parental sensitivity and child behavior problems ($k = 95$ for externalizing; $k = 70$ for internalizing problems). The median sample size across all studies was 141 (range: 8 to 3,387). Twenty-two studies reported low SES (20%), 15 middle-to-high SES (14%), 42 mixed SES (39%), and 29 did not report on SES (27%). The proportion of sample participants from minoritized racial and ethnic backgrounds ranged from 0% to 100% (median: 28%). The majority of studies included only biological parents (90%), while the remaining included a mix of biological and adoptive parents (5% of studies, proportion of adoptive/foster parents ranged from 1% to 18% in these studies) or only adoptive and foster parents (5%).

Parents were primarily mothers (mean: 94%, median: 100% mothers). Approximately half of children were boys (mean: 54%; median: 51%).

At the time of the sensitivity assessment, children were on average 44 months of age (range: 1 to 205 months; median: 36 months). The sensitivity assessment was conducted at home ($k = 54$; 50%), in the lab ($k = 47$; 44%), or not reported ($k = 7$; 6%). Thirty studies evaluated sensitivity in a structured task (28%), 23 in free-play tasks (21%), 25 in a naturalistic task (23%), and 29 in a combination of tasks (27%). More than half of studies used a composite measure of sensitivity ($k = 60$; 56%) and half used a single scale of sensitivity ($k = 48$; 44%). Coding systems included the Ainsworth/Ericksen system ($k = 13$; 12%), CARE-Index ($k = 2$; 2%), Emotional Availability Scales ($k = 8$; 7%), HOME ($k = 17$; 16%), MBQS ($k = 8$; 7%), and NICHD scales ($k = 13$; 12%); the remaining studies ($k = 47$; 44%) used another coding system.

At the time of the behavior problems assessment, children were 66 months of age on average (range: 4 to 205 months; median: 59 months). Behavior problems were assessed with questionnaires ($k = 94$; 87%), observational methods ($k = 3$; 3%), diagnostic interviews ($k = 5$; 5%), or a combination of methods ($k = 5$; 5%). Measure informants included parents ($k = 57$; 53%), fathers ($k = 1$; 1%), an unspecified parent ($k = 9$; 8%), teachers ($k = 8$; 9%), clinicians or observers ($k = 4$; 3%), the child ($k = 5$; 5%), or a combination of informants ($k = 24$; 22%). Forty-three studies used cross-sectional designs (40%), 48 used longitudinal designs (44%), and 17 reported both cross-sectional and longitudinal effect sizes (16%). Most studies were published peer-reviewed articles ($k = 83$; 74%), while the remaining were unpublished dissertations ($k = 25$; 26%). Publication year ranged from 1986 to 2019. For geographical region, 80 studies were conducted in North America (74%), 19 in Europe (18%), 1 in South America (1%), 3 in Oceania (3%), 2 in Asia (2%), 2 in the Middle East (2%), and 1 from multiple countries (1%).

Parental Sensitivity and Child Internalizing Meta-Analysis

Effect sizes ± 3 SDs from the mean were considered outliers and removed from the analysis ($k = 1$). After removing the outlier, 69 studies (14,729 parent-child dyads) were included in the random-effects meta-analysis. As shown in Figure 2, a small, significant, and negative association between parental sensitivity and children's internalizing problems was observed: $r = -.08$ (95% CI [-.12, -.05]). The funnel plot did not suggest asymmetry (see Supplemental Figure 1), and the Egger test was not significant ($z = 0.22, p = .826$), suggesting studies with smaller sample sizes did not present more extreme values. Between-study heterogeneity was identified ($Q = 243.39, p < .001; I^2 = 72.79\%$), thereby providing support for the exploration of moderators.

[insert Table 1 here]

As shown in Table 1, three of the moderators emerged as significant. Publication status was a significant moderator, indicating peer-reviewed articles were more likely to report a significant effect ($r = -.11, 95\% \text{ CI } [-.15, -.07]$) than dissertations ($r = -.01, 95\% \text{ CI } [-.08, .06]$). Studies using composite sensitivity measures identified stronger effect sizes ($r = -.13, 95\% \text{ CI } [-.18, -.09]$) than studies using single sensitivity scales ($r = -.03, 95\% \text{ CI } [-.08, .01]$). Effect sizes were stronger in samples with low SES ($r = -.14, 95\% \text{ CI } [-.22, -.07]$), when compared to samples with middle-to-high SES ($r = .001, 95\% \text{ CI } [-.08, .08]$).

[insert Figure 2 here]

Parental Sensitivity and Child Externalizing Meta-Analysis

Effect sizes ± 3 SDs from the mean were considered outliers and removed from the analysis ($k = 1$). After removing the outlier, a total of 94 studies (25,418 parent-child dyads) were included in the random-effects meta-analysis. As shown in Figure 3, a small, significant,

and negative association between parental sensitivity and children's externalizing was found: $r = -.14$ (95% CI [-.17, -.11]). The funnel plot did not reveal asymmetry (see Supplemental Figure 2), and the Egger test was not significant ($z = -0.07$, $p = .944$), suggesting studies with smaller sample sizes did not present more extreme values. Significant between study variation was identified ($Q = 443.61$, $p < .001$; $I^2 = 77.84\%$); however, none of the moderators examined were significant, as shown in Table 1.

[insert Figure 3 here]

Comparison of Internalizing and Externalizing Pooled Effect Sizes

Multilevel analysis of 165 effect sizes grouped in 107 studies was performed to compare the magnitude of effect sizes between the internalizing and externalizing meta-analyses, to account for studies that reported on both outcomes. The Wald test indicated a significant difference in the magnitude of the effect sizes ($F = 11.5$, $p = .001$). Specifically, the association between parental sensitivity and internalizing problems was smaller than that of sensitivity and externalizing problems (intercept [externalizing]: $r = -.14$, 95% CI [-.17, -.11]; difference: $r = .06$, 95% CI: [.03, .10]).

Discussion

Extensive empirical work has demonstrated the legacy of children's early caregiving environment on their development (e.g., Fraley et al., 2013). One of the most studied aspects of caregiving, parents' sensitivity, may protect against the risk of internalizing and externalizing problems in children. In this meta-analytic review of studies amassed to date on the topic, small and statistically significant associations were identified among parental sensitivity and children's internalizing problems ($r = -.08$, $k = 69$, $N = 14,729$) and externalizing problems ($r = -.14$, $k = 94$, $N = 25,418$). The magnitude of the effect size for externalizing problems was also significantly

larger than that of internalizing problems. Heterogeneity was identified in both meta-analyses. However, no moderators were identified for externalizing problems. Among moderators tested for internalizing problems, three emerged as significant: effects sizes were stronger in peer-reviewed studies compared to unpublished dissertations, in studies using composite rather than single scale measures of sensitivity, and in samples with low SES versus middle-to-high SES.

Past meta-analyses have identified small to moderate relations (Funder & Ozer, 2019) between various positive parenting behaviors and children's internalizing ($r = -.06$ to $-.28$; McLeod, Weisz et al., 2007; McLeod, Wood et al., 2007; Pinquart et al., 2017b) and externalizing ($r = -.18$ to $-.25$; Pinquart, 2017a; Rothbaum & Weisz, 1994) problems. Thus, the associations found herein are smaller in magnitude when compared to the wider parenting literature. A potential explanation for this finding is that prior meta-analyses included parent-reported questionnaire measures of parenting and child behavior problems, which may have contributed to the inflation of effect sizes due to shared method variance versus the sole inclusion of observational parenting measures in this study. Previous meta-analyses on child behavior problems have also included broader measures of positive parenting (e.g., positive affect, synchrony), whereas the current meta-analysis focused on identifying precise estimates between a theoretically rooted but narrower aspect of caregiving related to child attachment and socio-emotional development. The narrower, but unique focus of the current study on observed parental sensitivity is reflected in the relatively little overlap found among studies included herein and those in prior meta-analyses on positive parenting constructs and internalizing ($k = 0$ to 8; McLeod, Weisz et al., 2007; McLeod, Wood et al., 2007; Pinquart et al., 2017b; Rodrigues et al., 2021) or externalizing ($k = 0$ to 16; Pinquart, 2017a; Rodrigues et al., 2021; Rothbaum & Weisz, 1994) problems. Consistent with this notion, stronger associations were observed for

children's internalizing problems among studies using composite measures of sensitivity (e.g., sensitivity + warmth), rather than single scales of sensitivity. A practical implication of this finding is that in intervention work seeking to improve parenting behavior to impact child outcomes, an important consideration is the domain of child development seeking to be influenced.

An important finding emerging from the multilevel analysis was that stronger associations were found between parental sensitivity and children's externalizing problems, in comparison to associations with internalizing problems, a finding that parallels prior meta-analyses on fathers' responsivity (Rodrigues et al., 2021) and child attachment insecurity (Groh, Fearon, van Ijzendoorn, Bakermans-Kranenburg, & Roisman, 2017). One potential explanation for this finding is that measures of child internalizing problems are commonly reliant on behavioral observations of symptoms by external observers, who may not readily notice signs of anxiety or depression in children, while symptoms of externalizing problems frequently evoke notice and concern from teachers and parents. Moreover, these results are also consistent with etiological models of externalizing problems, which cite negative parenting behavior (Patterson & Oregon, 1982) and child characteristics that elicit negative parenting behavior (e.g., genetically influenced externalizing behavior; (Larsson, Viding, Rijdsdijk, & Plomin, 2008) as critical instigators and maintaining mechanisms of behavioral dysregulation in children. Specific to internalizing problems, parents' modeling of anxiety behaviors (e.g., avoidance of fear stimuli; Lawrence et al., 2019), overprotection (McLeod et al., 2007b), and rejection and hostility (McLeod et al., 2007a) have been suggested to contribute more significantly to the development of children's anxiety and depressive symptoms. Similarly, parenting behaviors associated with anxiety may be more domain specific and related to mechanisms directly implicated in the

propagation of learned fear and avoidance of fear stimuli (Lawrence, Waite, & Creswell, 2019).

It may be that harsh, controlling, and inconsistent parenting behaviors overlap with definitions of parental insensitivity to a greater extent than parental modeling, overprotectiveness, and rejection, thereby accounting for differences in the magnitude of associations found with externalizing and internalizing problems.

Regarding moderator analyses, the association between parental sensitivity and reduced risk for internalizing problems was stronger in samples with low SES, compared to those with middle-to-high SES. However, no differences were found based on race and ethnicity of participants or geographic region of the study. These findings underscore the important role parental sensitivity plays in shaping the positive socio-emotional development of children living in high risk contexts (Heckman, 2013) and illustrates the undue burden placed on parents to shelter their children from adversities within their social ecologies. Indeed, these findings point to the importance of facilitating equitable access to parenting resources and supports that promote child social-emotional development (Heckman, 2013).

Other contextual adversities may also contribute to the larger associations found between parent sensitivity and child internalizing problems in low SES samples, such as parent mental health problems (Goodman et al., 2011), single parenthood, and low parent education. In turn, it is possible that due to these contextual adversities, low levels of parenting sensitivity may have stronger effects on child internalizing problems in low SES samples than middle-to-high SES samples. Taken together, these findings emphasize the need for community-based prevention efforts that address the systemic barriers and contextual adversities contributing to low parental sensitivity, in order to effectively draw upon caregivers as powerful buffers of inequity for their children. Although SES was not a significant moderator of the association between parental

sensitivity and externalizing problems, it may be that other social determinants of health not assessed herein, such as maternal poverty status, receipt of public assistance, or neighborhood violence, may relate more directly to externalizing problems.

Effect sizes also did not differ based on parents' gender. Given the pattern of associations found for mothers and fathers in this study was similar to the pattern of associations found for fathers only (Rodrigues et al., 2021), the pathways through which parental sensitivity influences child behavior problems may be similar across parent genders. Child sex also did not moderate associations between parent sensitivity and child behavior problems. It is possible that individual child factors may be less important in regard to the association between sensitivity and behavior problems than the overall context of caregiving and parental sensitivity. It is also plausible there are nuanced interactions among child sex, temperament, and the caregiving environment that cannot be captured with meta-analytic techniques, but have been identified in individual studies (e.g., Scott et al., 2018). In addition, associations did not differ for biological or adoptive and foster families, suggesting the provision of sensitive caregiving in childhood may be protective against the development of child behavior problems even in the context of early separation from families of origin. Finally, with the exception of single versus composite measures of sensitivity, measurement characteristics did not emerge as significant moderators despite evidence suggesting measurements of parental sensitivity and child behavior are contextually dependent (Leerkes, Blankson, & O'Brien, 2009). For example, parental sensitivity measures were generally global in nature, with only two studies assessing sensitivity in distress-eliciting contexts (see Supplemental Table 3), and therefore may not have captured context-dependent forms or subtypes of sensitivity (e.g., responsiveness to infant vocalizations, sensitivity to non-distress cues) and their relation to child behavior problems (Leerkes et al., 2009).

Future Directions

A potential source of between-study variability that could not be explored in the current review may derive from individual differences regarding children's susceptibility to their early caregiving environment. Differential susceptibility models (Belsky, Bakermans-Kranenburg, & van Ijzendoorn, 2007) propose some children have specific individual characteristics (e.g., genetics, temperament) which make them more susceptible to positive and negative environmental contexts, meaning they can be susceptible to poor developmental outcomes in the context of stress and adversity (e.g., insensitive, harsh caregiving), but also benefit the most from enriching environments (i.e., sensitive caregiving). That is, certain children may be highly susceptible to environmental experiences, for better *and* for worse (Belsky et al., 2007). For example, children with certain genetic markers have been found to have poorer developmental outcomes in negative caregiving environments, but better developmental outcomes in more positive environments (Windhorst et al., 2015). Embedded within this line of research should be a consideration of the potential for developmentally sensitive periods for establishing patterns of differential susceptibility. Children with difficult temperaments, considered to be a correlate of later behavioral problems, may be most vulnerable to positive *and* negative parenting in infancy versus later in childhood (Slagt, Dubas, Deković, & van Aken, 2016). Given the difficulty of examining complex differential susceptibility models via meta-analysis, focused individual studies on twin and sibling differences in susceptibility are particularly welcome to provide more quasi-causal evidence of the role of different levels of sensitive caregiving on siblings' development of behavioral problems.

In the current study, only the directional association between parental sensitivity to child externalizing behaviors was examined. Importantly, a few studies have recognized the salient

role of children's behavior in eliciting parenting behavior. Kok et al. (2013) studied longitudinal associations with children's internalizing problems in early childhood using the NICHD SECCYD and Generation R datasets and found observed maternal sensitivity was consistently associated with children's internalizing problems across time. However, child internalizing effects on maternal sensitivity were only identified in the NICHD SECCYD dataset, and not in the Generation R sample. Zvara et al. (2018) examined longitudinal associations from middle childhood to adolescence using the NICHD SECCYD dataset and identified reciprocal interactions between fathers' sensitivity and children's behavior problems over time, as well as direct associations between children's externalizing problems and mothers' sensitivity. Scott et al. (2018) explored dyadic and family-level interrelations among two-parent families in the NICHD SECCYD sample. Analyses indicated mothers' sensitivity appeared more impactful on children's externalizing behaviors in early development, while fathers' sensitivity played a more prominent role in later development. In order to further elucidate the longitudinal relations between parental sensitivity and child behavior problems, individual participant data meta-analyses may be useful to conduct complex analyses that may not be adequately powered by single studies investigating these associations. Further insight into the causality and directionality of the association between parental sensitivity and child behavior may also be garnered through the use of intervention studies and could provide important insights into how fostering sensitive caregiving may decrease children's risk for behavioral concerns.

Research on parenting and child outcomes have largely focused on the role of mothers versus fathers in influencing children's developmental outcomes. The current synthesis of decades of research exemplifies a broader tendency for mother-centric research: in this review, approximately 94% of included samples were of mothers, 6% were fathers. This

underrepresentation of fathers is also consistent with past meta-analyses on determinants of child psychopathology (e.g., Goodman et al., 2011). Promisingly, in the last decade, a growing body of research has focused on the contribution of fathers to child development. This shift was evident in the current-meta-analysis, where fathers represented at least 50% of parent participants in six individual studies published over the last decade (see Supplementary Table 3). Still, the examination of whether the effect sizes of mothers and fathers are similar or different in terms of their contribution to child outcomes assumes a certain independence between mothering and fathering, which fails to capture their potentially mutual and bidirectional influence. In reality, mothers and fathers coexist and jointly influence child development as part of more complex family systems (Scott et al., 2018), and this needs to be more sufficiently examined in future research.

Several meta-analyses have established that parental sensitivity provides an essential foundation for children's development of attachment security (De Wolff & van Ijzendoorn, 1997; Zeegers et al., 2017), language development (Madigan et al., 2019), and socioemotional functioning (Rodrigues et al., 2021). Meta-analyses have also identified small-to-moderate relations between attachment insecurity and children's social competence with peers, internalizing problems, and externalizing problems (for review, see Groh et al., 2017). A natural extension of this body of work is to examine the indirect effect of sensitive parenting to child socioemotional functioning through children's attachment security. In future research, this indirect pathway could be examined via mediation analyses in individual studies, or via meta-analytic structural equation modelling (MASEM), a novel method that can examine the strength of the indirect effect, aggregated across all studies, as well as potential moderators.

Finally, in the current study, only studies of typically developing children were included.

However, associations between parental sensitivity and behavioral problems in children with developmental differences (e.g., autism spectrum disorder, traumatic brain injury) warrant concerted empirical attention given there may be increased stressors associated with parenting children with medical needs and differing abilities that could influence parenting behaviors. For example, negative parenting behaviors tend to increase in families with children who have different developmental abilities, such as lower IQ, mental age, or language skills (Ku, Stinson, & MacDonald, 2019). Increased parenting stress and differences in the ways children signal their needs might interfere with the ability of parents to notice and attend to their children's needs or cues (Ku et al., 2019). Thus, an important direction for future research is to further investigate the association of parental sensitivity and child behavior problems in samples where children have developmental differences or medical diagnoses.

Limitations

The results of the current meta-analysis should be taken in light of several limitations. First, the findings herein are correlational in nature, and do not imply causation. In an attempt to address directionality, only effects where parental sensitivity was measured concurrently or temporally prior to child behavior problems were included. Second, only two studies in this meta-analysis included parents experiencing psychopathology. Based on previous research, associations may be stronger in samples of parents with mental illness. For example, meta-analytic findings have shown parents with depression exhibit less sensitive caregiving (Bernard, Nissim, Vaccaro, Harris, & Lindhiem, 2018). Relatedly, a large body of literature also highlights continuity between parent psychopathology and child behavior problems (e.g., Goodman et al., 2011). Further research examining the role of parental psychopathology on the association between parental sensitivity and child behavior problems is needed to identify whether these

families may have a greater need for targeted interventions. Third, this meta-analysis examined the impact of parental sensitivity on child behavior problems across a wide range of developmental periods. Although age did not emerge as a significant moderator, most studies investigated the effects of parental sensitivity in early childhood rather than middle childhood or adolescence. Thus, findings emerging from this study should be contextualized in light of these data inclusion decisions.

Fourth, this study was limited in the types of parenting behaviors included in the systematic review and meta-analyses, focusing on observed sensitivity in its attachment tradition (Ainsworth, 1974), and excluding related, yet distinct constructs of parenting (e.g., mentalization, mind-mindedness). Such parenting behaviors are distally related to child attachment relations (Zeegers et al., 2017), and therefore could relate to child psychopathology. Similarly, this study did not include other parenting behaviors outside of a normative range of caregiving that may have greater implications for child behavior problems, such as disrupted parenting (e.g., Lyons-Ruth, Bronfman, & Parsons, 1999). Future research should seek to expand our understanding of how different parenting behaviors may put children at risk for internalizing and externalizing behavior problems.

Fifth, included samples were comprised primarily of mothers, biological parents, heterosexual parents, and White families in North American and European regions. While there is a growing recognition in the field to address gaps in the literature related to the representation of diverse families in research, recruitment of different family compositions and diverse racial and ethnic populations across world regions is warranted to develop an inclusive understanding of the role of parental sensitivity on child behavior problems. Sixth, this meta-analysis examined independent associations between parental sensitivity and children's internalizing and

externalizing problems; however, there is evidence of shared variance between internalizing and externalizing problems (Smith et al., 2020). Finally, few moderator effects were identified to explain the significant heterogeneity found for the externalizing problems meta-analysis. It is possible this finding is related to the categorical operationalization of several variables (e.g., SES) that could not be measured continuously due to differences in reporting and assessing these variables across studies, or to difficulties in synthesizing potential moderators (e.g., genetic factors) across studies.

Conclusions

Meta-analyses provide a statistically rigorous way to quantitatively combine findings across studies in order to test long-standing theories and potential moderators of associations to, in turn, guide directions for future research and practical applications. In the current synthesis, parental sensitivity demonstrated small, negative, and statistically significant associations with child behavior problems, wherein the association between parental sensitivity and externalizing problems was statistically larger than the association between parental sensitivity and internalizing problems. Associations with internalizing problems were significantly stronger among dyads from low versus middle-to-high socioeconomic backgrounds, in peer-reviewed studies versus unpublished dissertations, and in studies where composites rather than single scales of observed sensitivity were used.

Numerous meta-analyses now support consistent links among parental sensitivity and a variety of child developmental outcomes, including language, cognitive, socio-emotional, and executive functioning skills (Rodrigues et al., 2021; Madigan et al., 2019; Valcan et al., 2018). A number of studies also suggest changes in parental sensitivity are longitudinally related to changes in children's internalizing and externalizing problems (Kok et al., 2013). However, in

consideration of the relatively small associations found among parental sensitivity and child psychopathology, it will be important to examine whether the continued inclusion of intervention components that aim to improve parental sensitivity produce incremental changes in internalizing and externalizing symptoms over time. Additive and dismantling intervention designs may yield useful insights into whether changes in parental sensitivity lead to subsequent reductions in behavioral concerns, above and beyond existing evidence-based treatments. In addition, some studies suggest enhancing sensitive responding *and* sensitive discipline, may together engender greater reductions in children's behavioral symptoms, than one aspect of caregiving alone (see Juffer, Bakermans-Kranenburg, & van Ijzendoorn, 2017). Finally, longitudinal research is needed to disentangle the role of potential sources of variation that could not be examined meta-analytically herein, including posited individual vulnerability characteristics (e.g., temperament, genetics), the directionality and reciprocal nature of parent-child behavior, and non-independent contributions of multi-parent and diverse families on child development.

References

- Achenbach, T. M. (2020). Bottom-up and top-down paradigms for psychopathology: A half-century odyssey. *Annual Review of Clinical Psychology, 16*, 1-24.
<https://doi.org/10.1146/annurev-clinpsy-071119-115831>
- Ainsworth, M. D. S., Bell, S., & Stayton, D. (1974). Infant-mother attachment and social development. In M. P. Richards (Ed.), *The introduction of the child into a social world*. Cambridge, UK: Cambridge University Press.
- Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., & Juffer, F. (2003). Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin, 129*, 195-215. <https://doi.org/10.1037/0033-2909.129.2.195>
- Belsky, J., Bakermans-Kranenburg, M. J., & van Ijzendoorn, M. H. (2007). For better and for worse: differential susceptibility to environmental influences. *Current Directions in Psychological Science, 16*, 300-304. <https://doi.org/10.1111/j.1467-8721.2007.00525.x>
- Benton, J., Coatsworth, D., & Biringen, Z. (2019). Examining the association between emotional availability and mindful parenting. *Journal of Child and Family Studies, 28*, 1650-1663.
<https://doi.org/10.1007/s10826-019-01384-x>
- Bernard, K., Nissim, G., Vaccaro, S., Harris, J. L., & Lindhiem, O. (2018). Association between maternal depression and maternal sensitivity from birth to 12 months: A meta-analysis. *Attachment & Human Development, 20*, 578-599.
<https://doi.org/10.1080/14616734.2018.1430839>
- Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2021). *Introduction to meta-analysis*. Hoboken, NJ: John Wiley & Sons, Inc.
- Bowlby, J. (1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York, NY: Basic

Books. (Original work published in 1969).

Cabrera, N., Tamis-LeMonda, C. S., Bradley, R. H., Hofferth, S., & Lamb, M. E. (2000).

Fatherhood in the twenty-first century. *Child Development, 71*, 127-136.

Cosgrove, V. E., Rhee, S. H., Gelhorn, H. L., Boeldt, D., Corley, R. C., Ehringer, M. A., Y... &

Hewitt, J. K. (2011). Structure and etiology of co-occurring internalizing and externalizing disorders in adolescents. *Journal of Abnormal Child Psychology, 39*, 109-123. <https://doi.org/10.1007/s10802-010-9444-8>

De Los Reyes, A., Henry, D. B., Tolan, P. H., & Wakschlag, L. S. (2009). Linking informant discrepancies to observed variations in young children's disruptive behavior. *Journal of Abnormal Child Psychology, 37*, 637-652. <https://doi.org/10.1007/s10802-009-9307-3>

De Wolff, M. S., & van IJzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development, 68*, 571-591. <https://doi.org/https://doi.org/10.1111/j.1467-8624.1997.tb04218.x>

Easterbrooks, M. A., Bureau, J. F., & Lyons-Ruth, K. (2012). Developmental correlates and predictors of emotional availability in mother-child interaction: A longitudinal study from infancy to middle childhood. *Developmental Psychopathology, 24*, 65-78. <https://doi.org/10.1017/s0954579411000666>

Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental Socialization of Emotion. *Psychological Inquiry, 9*, 241-273. https://doi.org/10.1207/s15327965pli0904_1

Fearon, R. M. P., Groh, A. M., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., & Roisman, G. I. (2016). Attachment and Developmental Psychopathology. In *Developmental Psychopathology* (pp. 1-60). Hoboken, NJ: John Wiley & Sons, Inc.

Ferguson, C. J., & Brannick, M. T. (2012). Publication bias in psychological science: prevalence,

methods for identifying and controlling, and implications for the use of meta-analyses.

Psychological methods, 17, 120-128. <https://doi.org/10.1037/a0024445>

Fraley, R. C., Roisman, G. I., & Haltigan, J. D. (2013). The legacy of early experiences in development: Formalizing alternative models of how early experiences are carried forward over time. *Developmental Psychology*, 49, 109–126.

<https://doi.org/10.1037/a0027852>

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science*, 2, 156-168.

<https://doi.org/10.1177/2515245919847202>

Goodman, S.H., Rouse, M.H., Connell, A.M., Broth, M.R., Hall, C.M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical Child and Family Psychology Review*, 14, 1-27.

<https://doi.org/10.1007/s10567-010-0080-1>

Groh, A. M., Fearon, R. M. P., van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., & Roisman, G. I. (2017). Attachment in the early life course: Meta-analytic evidence for its role in socioemotional development. *Child Development Perspectives*, 11, 70-76.

<https://doi.org/https://doi.org/10.1111/cdep.12213>

Grusec, J. E. (1992). Social learning theory and developmental psychology: The legacies of Robert Sears and Albert Bandura. *Developmental Psychology*, 28, 776–786.

<https://doi.org/10.1037/0012-1649.28.5.776>

Heckman, J., Pinto, R., & Savelyev, P. (2013). Understanding the mechanisms through which an influential early childhood program boosted adult outcomes. *American Economic Review*,

103, 2052-86. <https://doi.org/10.1257/aer.103.6.2052>

Hostinar, C. E., Sullivan, R. M., & Gunnar, M. R. (2014). Psychobiological mechanisms

- underlying the social buffering of the hypothalamic-pituitary-adrenocortical axis: A review of animal models and human studies across development. *Psychological Bulletin*, *140*, 256-282. <https://doi.org/10.1037/a0032671>
- Juffer, F., Bakermans-Kranenburg, M. J., & van Ijzendoorn, M. H. (2017). Pairing attachment theory and social learning theory in video-feedback intervention to promote positive parenting. *Current Opinion in Psychology*, *15*, 189-194. <https://doi.org/10.1016/j.copsyc.2017.03.012>
- Kok, R., Linting, M., Bakermans-Kranenburg, M. J., van Ijzendoorn, M. H., Jaddoe, V. W. V., Hofman, A., ... & Tiemeier, H. (2013). Maternal sensitivity and internalizing problems: Evidence from two longitudinal studies in early childhood. *Child Psychiatry & Human Development*, *44*, 751-765. <https://doi.org/10.1007/s10578-013-0369-7>
- Ku, B., Stinson, J. D., & MacDonald, M. (2019). Parental behavior comparisons between parents of children with Autism Spectrum Disorder and parents of children without Autism Spectrum Disorder: A meta-analysis. *Journal of Child and Family Studies*, *28*, 1445-1460. <https://doi.org/10.1007/s10826-019-01412-w>
- Larsson, H., Viding, E., Rijdsdijk, F. V., & Plomin, R. (2008). Relationships between parental negativity and childhood antisocial behavior over time: a bidirectional effects model in a longitudinal genetically informative design. *Journal of Abnormal Child Psychology*, *36*, 633-645. <https://doi.org/10.1007/s10802-007-9151-2>
- Lawrence, P. J., Waite, P., & Creswell, C. (2019). Environmental factors in the development and maintenance of anxiety disorders. In S. N. Compton, M. A. Villabø, & H. Kristensen (Eds.), *Pediatric Anxiety Disorders* (pp. 101-124). Cambridge, MA: Academic Press.
- Leerkes, E. M., Blankson, A. N., & O'Brien, M. (2009). Differential effects of maternal

- sensitivity to infant distress and nondistress on social-emotional functioning. *Child Development, 80*, 762-775. <https://doi.org/https://doi.org/10.1111/j.1467-8624.2009.01296.x>
- Lucassen, N., Tharner, A., Van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., Volling, B. L., Verhulst, F. C., ... & Tiemeier, H. (2011). The association between paternal sensitivity and infant–father attachment security: A meta-analysis of three decades of research. *Journal of Family Psychology, 25*, 986-992. <https://doi.org/10.1037/a0025855>
- Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999). Chapter IV. Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development, 64*, 67-96. <https://doi.org/https://doi.org/10.1111/1540-5834.00034>
- Madigan, S., Prime, H., Graham, S. A., Rodrigues, M., Anderson, N., Khoury, J., & Jenkins, J. M. (2019). Parenting behavior and child language: A meta-analysis. *Pediatrics, 144*, e20183556. <https://doi.org/10.1542/peds.2018-3556>
- McLeod, B. D., Weisz, J. R., & Wood, J. J. (2007). Examining the association between parenting and childhood depression: A meta-analysis. *Clinical Psychology Review, 27*, 986-1003. <https://doi.org/https://doi.org/10.1016/j.cpr.2007.03.001>
- McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between parenting and childhood anxiety: A meta-analysis. *Clinical Psychology Review, 27*, 155-172. <https://doi.org/https://doi.org/10.1016/j.cpr.2006.09.002>
- Mesman, J., & Emmen, R. A. G. (2013). Mary Ainsworth’s legacy: a systematic review of observational instruments measuring parental sensitivity. *Attachment & Human Development, 15*, 485-506. <https://doi.org/10.1080/14616734.2013.820900>

- Mesman, J., van Ijzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2012). Unequal in opportunity, equal in process: Parental sensitivity promotes positive child development in ethnic minority families. *Child Development Perspectives*, 6(3), 239-250. <https://doi.org/https://doi.org/10.1111/j.1750-8606.2011.00223.x>
- Miller, A. B., & Prinstein, M. J. (2019). Adolescent suicide as a failure of acute stress-response systems. *Annual Review of Clinical Psychology*, 15, 425-450. <https://doi.org/10.1146/annurev-clinpsy-050718-095625>
- Patterson, G. R., & Oregon, E. (1982). A social learning approach, Volume 3: *Coercive family process*. Eugene, OR: Castalia.
- Pinquart, M. (2017a). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental Psychology*, 53, 873. <https://doi.org/10.1037/dev0000295>
- Pinquart, M. (2017b). Associations of parenting dimensions and styles with internalizing symptoms in children and adolescents: A meta-analysis. *Marriage & Family Review*, 53, 613-640. <https://doi.org/10.1080/01494929.2016.1247761>
- Raby, K. L., Roisman, G. I., Fraley, R. C., & Simpson, J. A. (2015). The enduring predictive significance of early maternal sensitivity: Social and academic competence through age 32 years. *Child Development*, 86, 695-708. <https://doi.org/10.1111/cdev.12325>
- Rodrigues, M., Sokolovic, N., Madigan, S., Luo, Y., Silva, V., Misra, S., & Jenkins, J. (2021). Paternal sensitivity and children's cognitive and socioemotional outcomes: A meta-analytic review. *Child Development*, 92, 554-577. <https://doi.org/10.1111/cdev.13545>
- Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: a meta-analysis. *Psychological Bulletin*, 116, 55.

Russo, M. W. (2007). How to review a meta-analysis. *Gastroenterology & Hepatology*, *3*, 637.

Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist*, *54*, 93-105. <https://doi.org/10.1037/0003-066X.54.2.93>

Scott, J. K., Nelson, J. A., & Dix, T. (2018). Interdependence among mothers, fathers, and children from early to middle childhood: Parents' sensitivity and children's externalizing behavior. *Developmental Psychology*, *54*, 1528-1541. <https://doi.org/10.1037/dev0000525>

Slagt, M., Dubas, J. S., Deković, M., & van Aken, M. A. G. (2016). Differences in sensitivity to parenting depending on child temperament: A meta-analysis. *Psychological Bulletin*, *142*, 1068-1110. <https://doi.org/10.1037/bul0000061>

Smith, G. T., Atkinson, E. A., Davis, H. A., Riley, E. N., & Oltmanns, J. R. (2020). The general factor of psychopathology. *Annual Review of Clinical Psychology*, *16*, 75-98.

<https://doi.org/10.1146/annurev-clinpsy-071119-115848>

Smith, M. (2011). Measures for assessing parenting in research and practice. *Child and Adolescent Mental Health*, *16*, 158-166. <https://doi.org/https://doi.org/10.1111/j.1475-3588.2010.00585.x>

Sturge-Apple, M. L., Davies, P. T., Cicchetti, D., & Manning, L. G. (2010). Mothers' parenting practices as explanatory mechanisms in associations between interparental violence and child adjustment. *Partner Abuse*, *1*, 45-60. <https://doi.org/10.1891/1946-6560.1.1.45>

Valcan, D. S., Davis, H., & Pino-Pasternak, D. (2018). Parental behaviours predicting early childhood executive functions: A meta-analysis. *Educational Psychology Review*, *30*, 607-649. <https://doi.org/10.1007/s10648-017-9411-9>

van der Voort, A., Linting, M., Juffer, F., Bakermans-Kranenburg, M. J., Schoenmaker, C., & van Ijzendoorn, M. H. (2014). The development of adolescents' internalizing behavior:

- longitudinal effects of maternal sensitivity and child inhibition. *Journal of Youth and Adolescence*, 43, 528-540. <https://doi.org/10.1007/s10964-013-9976-7>
- Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of statistical software*, 36, 1-48.
- Windhorst, D. A., Mileva-Seitz, V. R., Linting, M., Hofman, A., Jaddoe, V. W. V., Verhulst, F. C., ... & Bakermans-Kranenburg, M. J. (2015). Differential susceptibility in a developmental perspective: DRD4 and maternal sensitivity predicting externalizing behavior. *Developmental Psychobiology*, 57, 35-49. <https://doi.org/https://doi.org/10.1002/dev.21257>
- Zahn-Waxler, C., Shirtcliff, E. A., & Marceau, K. (2008). Disorders of childhood and adolescence: Gender and psychopathology. *Annual Review of Clinical Psychology*, 4, 275-303. <https://doi.org/10.1146/annurev.clinpsy.3.022806.091358>
- Zeegers, M. A. J., Colonesi, C., Stams, G.-J. J. M., & Meins, E. (2017). Mind matters: A meta-analysis on parental mentalization and sensitivity as predictors of infant-parent attachment. *Psychological Bulletin*, 143, 1245-1272. <https://doi.org/10.1037/bul0000114>
- Zimmer-Gembeck, M. J., Thomas, R., Hendrickson, K., Avdagic, E., Webb, H., & McGregor, L. (2013). Maternal emotional distress, abuse risk, and children's symptoms: Child gender as a moderator of parent sensitivity as a mediator. *Infant and Child Development*, 22, 480-500. <https://doi.org/https://doi.org/10.1002/icd.1804>
- Zvara, B. J., Sheppard, K. W., & Cox, M. (2018). Bidirectional effects between parenting sensitivity and child behavior: A cross-lagged analysis across middle childhood and adolescence. *Journal of Family Psychology*, 32, 484-495. <https://doi.org/10.1037/fam0000372>