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Bridging parental attachment insecurity, social cognition, parenting, and temperament to elucidate the origins of antisocial orientation in preschoolers

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ABSTRACT

One pathway to children's antisocial orientations implicates a longitudinal sequence from parents' attachment insecurity to their hostile representations of the child (Internal Working Models, IWMs) to negative parenting. The relevant research, however, is subject to limitations. One, although parts of that path have been robustly supported, few studies have formally examined the entire longitudinal cascade. Two, the pertinent studies have rarely considered child temperament. In a study of 200 families (mothers, fathers, and children), we examined whether the path from parental insecurity in infancy, to parental hostile IWMs of the child, to negative parenting, both at toddler age, to children's antisocial orientation at preschool age was moderated by children's toddler-age temperament. For mothers and children, the path was found only for children with highly difficult temperaments. Research bridging frameworks informed by attachment theory, social cognitive representations, parenting, and temperament can enhance our understanding of early origins of antisocial outcomes.

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Antisocial, disruptive, or externalizing conduct problems are a significant source of suffering and costs for individuals, families, and societies (Goulter et al., 2024), and thus understanding their early developmental pathways remains a key goal in developmental psychology and psychopathology. Yet, despite voluminous research and substantial progress, a comprehensive picture remains elusive, in part because the origins of antisocial developmental outcomes are multiply determined, including the qualities of the parent, parenting, and the child (Hyde et al., 2013, 2025; Lin et al., 2022; Shaw et al., 2012, 2019; Trentacosta et al., 2019; Waller et al., 2013).

In this work, we incorporate three broad sets of parental factors, representing several theoretical perspectives, extensively studied and robustly supported in growing bodies of literature as contributors to children's antisocial developmental outcomes. Those include parents' insecure (avoidant or anxious) attachment styles, informed by attachment theory; parental hostile representations of the child, informed by the social cognitive perspective; and negative parenting, informed by socialization research.

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Although all three sets of factors have been theoretically proposed and supported empirically as contributors to children's antisocial outcomes, that research, although vast, lacks integration. The entire developmental cascade from parents' attachment insecurity to their hostile representations (or Internal Working Models, IWMs) of the child, to their negative (unresponsive, harsh, intrusive) parenting, to children's antisocial outcomes has rarely – if ever – been examined longitudinally. Various parts of that cascade, however, have been supported.

First, a large body of research has provided evidence of bivariate associations among those sets of factors. Parents' attachment orientations have been linked with their IWMs of their children in the rapidly growing literature on parental mentalization (e.g., Dykas & Cassidy, 2011; Dykas et al., 2011; Luyten et al., 2017; Main et al., 1985; Nijssens et al., 2020; Pazzagli et al., 2018; Sharp & Fonagy, 2008) and with their parenting behaviors. Within their own early attachment relationships, parents internalize representations and experiences of their own caregiving, resulting in their secure/autonomous, avoidant/dismissing, or anxious/preoccupied attachment styles or orientations (Fraley et al., 2011; Mikulincer & Shaver, 2016). Once they assume their caregiving roles, those orientations are thought to impact multiple aspects of parenting (see reviews by Jones et al., 2015; Simpson & Karantzas, 2019; van IJzendoorn & Bakermans-Kranenburg, 2019). Parental insecurity (avoidance and anxiety) has been associated with less adaptive or more negative parenting. Compared to secure parents, insecure parents feel less close to and less supportive of preschool age children, are less sensitive and responsive, and use less adaptive and harsher discipline (Adam et al., 2004; Cowan et al., 2019; Edelstein et al., 2004; Lo et al., 2019; Millings et al., 2013; Negrão et al., 2016; Selcuk et al., 2010; Verschueren et al., 2006). Parental insecurity has also been linked with children's problems, such as anxiety (Esbjørn et al., 2013).

Parents' IWMs of their children – conceptualized as reflective functioning, mind-mindedness, mentalization, attributions, or relational schemas and assessed as explicit or implicit cognitive and affective constructs – impact many dimensions of their caregiving. Negative, hostile representations are generally associated with maladaptive, unresponsive, harsh, and punitive parenting (Bugental & Johnston, 2000; Camoirano, 2017; Dykas et al., 2011; Garon-Bissonnette et al., 2024; Humphreys et al., 2024; Katznelson, 2014; Kerr & Capaldi, 2019; Kochanska et al., 2019; Korja et al., 2010; Leung & Slep, 2006; Luyten et al., 2017; McMahon & Bernier, 2017; Meins, 1999; Rostad & Whitaker, 2016; Sharp & Fonagy, 2008; Slade et al., 1999; Slep & O'Leary, 1998; Smith et al., 2013, 2015; Stuhrmann et al., 2022; Trepiak et al., 2025; Waller et al., 2012; Zeegers et al., 2017). Parents' hostile representations of their children are also related to negative developmental outcomes, including externalizing problems in children (Johnston et al., 2009; Nieto-Retuerto et al., 2024).

Negative, unresponsive, rejecting, harsh, or intrusive parenting is often seen as a robust, key proximal contributor to a variety of children's antisocial or externalizing problems (Dishion & Patterson, 2006; Mo et al., 2023; Pardini et al., 2015; Pinquart, 2017, 2021; Shaw & Bell, 1993; Shaw et al., 2012; Waller et al., 2018). Those associations have been found across cultures (Rothenberg et al., 2022).

Second, there is evidence of partial mediated paths that bolsters the model of the entire mediation sequence from parents' attachment insecurity to their hostile IWMs of the child to negative parenting to children's antisocial outcomes. The links between

parents' insecure attachment orientations and dysfunctional parenting are often thought to be accounted for, in part, by parental negative, hostile IWMs of their children. As examples, in an early study, Slade et al. (1999) demonstrated associations among mothers' insecure attachment, assessed when the child was 12 months, hostile, angry representations of the child at 15 months, and negative parenting, observed at 15 and 21 months. An and Kochanska (2022) reported the path from mothers' attachment insecurity when children were infants to their hostile IWMs of their children to harsh, power-assertive control at toddler age. Gross et al. (2023) found a similar path from attachment insecurity in mothers of 3–4-year-olds to hostile attributions regarding their children to unsupportive responses to child distress. Those studies, however, did not extend the examined pathways to include children's outcomes.

Platts et al. (2024) supported a path from mothers' attachment anxiety (to the romantic partner) to inconsistent, harsh parenting to increases in children's anger reactivity from age 3 to 4. They did not, however, measure mothers' hostile IWMs of their children. Several studies provided empirical evidence of cross-sectional and longitudinal mediation from parents' hostile IWMs to negative, harsh, or dysfunctional parenting to behavioral problems in their children (Bullock & Dishion, 2007; Gordo et al., 2020; Nix et al., 1999; Park et al., 2016; Smith et al., 2015), but those studies did not include parents' attachment security as a predictor of their IWMs. Nijssens et al. (2020) demonstrated a path from mothers' and fathers' attachment insecurity in infancy to their hostile IWMs of the child (Prementalizing) to the child's competencies and behavior problems at toddler age, but they did not assess parenting.

Reviewing the above broad bodies of research more extensively is beyond the scope of the current work. It is clear, however, that extant theoretical work and empirical evidence support the various links within the proposed developmental path from parents' attachment to their hostile IWMs of their children to negative parenting to antisocial outcomes. Yet, although cumulatively rich, that work is siloed or compartmentalized, in that *the entire sequence, or developmental cascade*, has rarely – if ever – been formally tested in a longitudinal design. Thus, the first aim of the current study was to expand upon the previous work and examine the proposed entire cascade from infancy to preschool age, including all the posited consecutive links from parents' insecure attachment to their hostile IWMs of the child to negative parenting to children's antisocial orientation.

The second aim was to address another important gap – to examine the moderating role of the child's temperament. Extensive research has persuasively elucidated distinct effects of parenting on children varying in their biologically based temperaments. That research, dating to Thomas and Chess' (1977) concept of "goodness of fit," has rapidly evolved over the last five decades into increasingly sophisticated models depicting interactions between parenting and temperament (Belsky & Pluess, 2009; Belsky et al., 2007; Pluess, 2015; Rothbart & Bates, 2006). In particular, many studies have demonstrated that the negative effects of unresponsive, harsh, intrusive, or inconsistent parenting on children's behavioral problems were exacerbated among children with more difficult temperaments, especially those highly prone to frustration, dysregulated anger, and irritability (Kiff et al., 2011; Morris et al., 2002; Sanson et al., 2004; Slagt et al., 2016; van Zeijl et al., 2007).

Surprisingly, however, such frameworks have not been integrated with research on the cascade from parents' attachment styles to their hostile IWMs of their children to negative

parenting to antisocial outcomes. Based on the cumulative evidence from research on the role of child temperament, we expected that the detrimental impact of such a cascade should be most pronounced for children with difficult temperaments, prone to intense, dysregulated anger. In partial support, Sher-Censor et al. (2016) reported that one aspect of mothers' IWMs of their preschool-age children (incoherence of maternal narratives) predicted children's externalizing behavior at early school age, but only for children with high levels of temperamental self-regulation difficulties. They did not, however, measure mothers' attachment or their parenting.

As an additional aim, we examined similarities and differences across mother- and father-child relationships by collecting all parallel measures in both dyads. Although our understanding of socialization processes in fathers and children has been on the rise, pertinent research continues to lag stubbornly behind that on mothers and children.

To summarize, the model tested in this investigation addressed two aims, drawing from a community sample of 200 mothers, fathers, and infants, followed for approximately 4 years. One aim was to examine a sequential mediated cascade from parents' insecure attachment, assessed when children were infants (8 months), to their hostile IWMs of their children, measured at toddler age (16 months), to their negative parenting, also at toddler age, to children's antisocial orientations at 4.5 years (52 months). Our second aim was to test whether the cascade would be moderated by children's difficult temperament, conceptualized as proneness to anger and anger dysregulation at toddler age. A rapprochement among parental attachment, their social cognition, parenting, child temperament, and child outcomes has long been advocated as part of ecologically informed approaches to human development (Taraban & Shaw, 2018). By allowing insights into early developmental cascades leading to children's antisocial outcomes and into multifinality of those cascades, conditional on children's temperaments, this work also embodies the integrative spirit of developmental psychopathology (Kochanska & An, 2024).

In terms of our analytic approach, we proposed and tested, for mother- and father-child dyads, a developmental path involving serial or sequential mediation: From parents' insecure attachment when children were 8 months old to parents' hostile IWMs of the child at 16 months to negative parenting at 16 months to children's antisocial outcomes at 52 months. Additionally, we proposed that child difficult temperament at 16 months would moderate or alter that path, such that the path should be most pronounced for highly difficult children (thus testing moderated mediation). Figure 1 illustrates our model.

When choosing our measures, we aimed for conceptually grounded, robustly assessed constructs. We used a combination of highly established parental reports, interviews, and observations of parents' and children's behavior. To create final constructs, we followed the principle of aggregation (Rushton et al., 1983) when justified and feasible, adopting Principal Component Analysis (PCA) to extract the common constructs underlying a set of coherent measures.

We were inspired by a recent influential review (Jones et al., 2015), which emphasized the importance and promise of research that integrates self-reported parental attachment styles, or attachment orientations, with observational, preferably longitudinal, assessments of parenting. They further argued that such research should include parents' internal representations of the child as potential mediators.

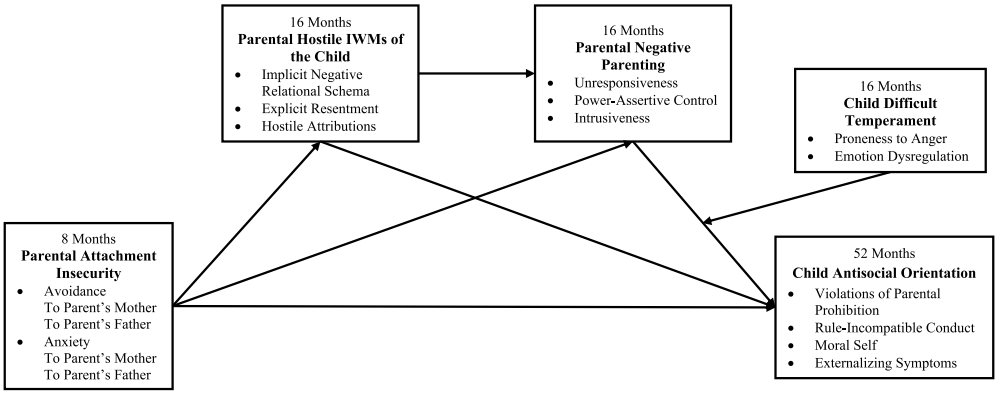

Figure 1. Proposed moderated mediation model from parents' attachment insecurity to their hostile Internal Working Models of the child to negative parenting to children's future antisocial orientations, moderated by children's difficult temperament. IWM = Internal Working Model. The overall indirect effect of parents' insecurity on children's outcomes (antisocial orientation) is seen as mediated through several sequential steps: from parents' insecurity to their hostile IWMs, from hostile IWMs to negative parenting, and from negative parenting to child outcomes (antisocial orientation). Alternative potential mediated paths (from parental insecurity to IWMs to child outcomes and from insecurity to parenting to child outcomes) are also tested. Child difficult temperament is modeled as a moderator, to test whether the above mediated paths differ depending on child difficulty.

Based on their review, we chose Experiences in Close Relationships-RS (ECR-RS, Fraley et al., 2011) as the measure of parents' attachment. ECR-RS is used worldwide, and it has excellent psychometric qualities (Crowell et al., 2016). Jones et al. (2015) further pointed out that the continuous scores of avoidance and anxiety produced by ECR-RS are a highly desirable feature. ECR-RS targets participants' avoidance and anxiety toward their own mother, father (or mother-like and father-like figures), romantic partner, and friend. These scales can be averaged across several attachment figures to reflect attachment-related anxiety, attachment-related avoidance, or attachment insecurity broadly. Researchers are encouraged to select the scores most pertinent to the given study. We chose to focus on our participating parents' attachment to their own mothers and fathers, considering it most pertinent in the context of parenting.

With regard to the measures of parents' hostile IWMs of the child, we followed recommendations by Garon-Bissonnette et al. (2024), who urged researchers to include multiple – both implicit and explicit – instruments, reflecting multiple aspects of IWMs. In our observations of parenting, we targeted several aspects, broadly considered maladaptive or sub-optimal: the classic dimensions of (un)responsiveness and harsh control (Ainsworth et al., 1971; Maccoby & Martin, 1983), along with intrusiveness (Grolnick & Pomerantz, 2009).

When assessing developmental antisocial outcomes, we deployed several observational measures of individual differences in aspects of children's emerging morality, developed and refined in our laboratory. Those measures target children's (dis)regard for rules, observed in paradigms when the child is alone and faced with temptations to violate (or comply with) rules of conduct, and their moral self-concept, or self-descriptions

on moral dimensions, assessed using a puppet interview. Those outcomes have often been found to cohere (Aksan & Kochanska, 2005; Kochanska et al., 2010). We also used established parental reports of externalizing symptoms.

Finally, when assessing children's difficult temperament, we targeted its two most often studied aspects, anger proneness and dysregulation. We deployed an anger episode from the well-established observational assessment, Laboratory Temperament Assessment Battery (Lab-Tab; Goldsmith & Rothbart, 1999; Planalp et al., 2017).

Method

Participants

Two-parent families with typically developing infants, born in 2017–2018, residing in a college town, a small city, and rural areas in the Midwest volunteered for the study. The study was approved by the University of Iowa IRB (CAPS, 201701705) and parents provided consent at the entry. Families were mostly White, however, in 20% of families (N = 40), one or both parents were not "White Alone." The families were well representative of the state where they lived. Demographic details are in Supplement 1, Table S1.

Overview of design

The data reported here came from assessments conducted when the children were 8 months, N = 200, 96 girls (parents' self-reported attachment insecurity), 16 months, N = 194, 93 girls (parents' hostile IWMs of the child, expressed in reports and interviews, observed negative parenting, and children's observed difficult temperament), and 52 months, N = 177, 86 girls (children's observed and parent-reported antisocial orientation). At 16 months and 52 months, mother- and father-child dyads participated in 2–3.5-hour, scripted sessions, conducted by experimenters (Es) in the laboratory, video-recorded for later coding. Upon entry, parents were asked to communicate to the child that highly enticing toys and objects on a low shelf were off limits and asked to enforce this prohibition throughout the session. Because several observational measures of parenting and children's antisocial orientation have been reported in the past, the descriptions are brief, and more procedural details are included in Supplement 4.

Measures

Parents' self-reported attachment insecurity to own parents, 8 months

Parents completed the ECR-RS (Fraley et al., 2011). They responded to 9 items, rated from 1 = *strongly disagree*; to 7 = *strongly agree*, describing their relationship with their own mother (or mother-like figure) and their own father (or father-like figure), with six items assessing attachment-related avoidance (e.g., "I don't feel comfortable opening up to this person," "I prefer not to show this person how I feel deep down," αs = .93 for participating mothers, αs = .92 for participating fathers) and three assessing attachment-related anxiety (e.g., "I often worry that this person doesn't really care for me," "I'm afraid this person may abandon me," αs = .84–.85 for mothers, αs = .93–.94 for fathers). The scores were averaged across

the pertinent items into an avoidance score and an anxiety score for each participating parent's mother and an avoidance score and an anxiety score for each participating parent's father.

Avoidance scores were significantly correlated across participants' relationships with their own mother and father ($r = .40$ for participating mothers and $r = .44$ for participating fathers, $ps < .001$). Anxiety scores were also significantly correlated across participants' relationships with their own mother and father ($rs = .49$ for participating mothers and fathers, $ps < .001$). Thus, participating parents' avoidance scores were aggregated across their mother (or mother-like) and father (or father-like) figures into avoidance scores. Anxiety scores were aggregated identically. Those avoidance and anxiety scores were highly correlated ($r = .60$ for participating mothers and $r = .52$ for participating fathers, $ps < .001$), and thus, were averaged to represent total attachment insecurity scores (one for each participating parent). Participating mothers' and fathers' attachment insecurity scores were not significantly different. For more information on data aggregation, see An and Kochanska (2022).

Parents' hostile Internal Working Models (IWMs) of the child, 16 months

Implicit negative relational schema of the child. E conducted the Five-Minute Speech Sample interview (Bullock & Dishion, 2007; Sher-Censor, 2015) with the parent when the child was not in the room. Following standard instructions, E asked the parent to talk about the child and their relationship for 5 minutes and provided no further prompts (see also An & Kochanska, 2022). Audio-recorded interviews were coded by off-site professional coders using the Family Affective Attitudes Rating Scale (Bullock & Dishion, 2007).

We focused on the 6-item dimension of criticism (e.g., criticism of child behavior or traits, negative comments on the relationship with child, negative humor or sarcasm, attributions of negative intentions to child). Each item was rated from 1 to 9, with 1 = *no evidence during the interview* and 9 = *clear, multiple examples*. Following standard approach to reliability, the agreement was 96%, with the required standard being 80% (Greenlee et al., 2019; Smith et al., 2013; Waller et al., 2012); intra-class correlation (ICC), was .75. We standardized and averaged the items (having dropped one that was highly skewed) into composites of negative relational schemas of the child for each parent ($\alpha = .59$ for mothers and .52 for fathers). When comparing unstandardized scores, mothers showed higher negative schemas, $t(185) = 3.22$, $p < .01$.

Explicit resentment of the child. We used Parental Stress Index (Abidin, 2012). We selected the "child domain" score, the sum of six subscales reflecting the perception of the child as a source of parenting stress due to his or her challenging or disappointing qualities (e.g., demanding, causing negative parenting experiences). This has been used as a measure of explicit resentment of the child (Callender et al., 2012; An et al., 2022). Cronbach's αs were .66–.83 for mothers, .68–.80 for fathers. Mothers' and fathers' scores were not significantly different. The scores were standardized.

Hostile attributions regarding the child. Parents also reported the extent to which they perceived their child's misbehaviors as intentionally hostile in Parent Cognition Scale (Snarr et al., 2009). We used the 9-item Child Responsible scale, from 1 = *never true* to 6 = *always true* (e.g., "My child purposely tries to get me angry;" Cronbach's α .79 for mothers

and .80 for fathers, with final scores averaged across items). Fathers expressed more negative explicit resentment, $t(179) = -2.60$, $p < .05$. The scores were standardized.

Data aggregation. We submitted the parents' three aforementioned scores to PCA with Varimax rotation. For both mother- and father-child dyads, the PCA recovered a single component, with higher scores clearly reflecting a more hostile IWM of the child: All measures loaded positively, with loadings ranging .65–.83 for mothers and .66–.83 for fathers. For mothers, Eigenvalue was 1.77 with 59.04% of variance; for fathers, Eigenvalue was 1.75 with 58.44% of variance. Those components were used as the measure of the given parent's hostile IWM of the child.

Parents' negative parenting, 16 months

Parents' unresponsiveness. Responsiveness was observed in naturalistic but scripted interactive contexts in the laboratory (e.g., play, snack, parent busy; 25 min total). Each context was coded from 1 = *highly unresponsive* to 7 = *highly responsive*, based on sensitivity-insensitivity, cooperation-interference, and acceptance-rejection dimensions (Ainsworth et al., 1971). Reliability, weighted kappas, were .87–.93 and .86–.92, for mothers and fathers, respectively. The scores were averaged across contexts into an overall responsiveness score ($\alpha = .66$ for mothers and .71 for fathers). Mothers were more responsive, $t(185) = 2.94$, $p < .01$. Those scores were standardized and reversed to denote unresponsiveness.

Parents' power-assertive control. Power assertive control was coded in two contexts. One context included 15 min of naturalistic, scripted interactions encompassing everyday situations (i.e., keeping the child from touching the off-limits toys, free time, and delay of snack). Coders rated parental control for each 20-s segment. The other context involved a toy cleanup. The parent instructed the child to put all toys after play into a basket (10 min total). Coders rated parental control for each 30-s segment. For details, see An and Kochanska (2022). Codes ranged from *no control* to *gentle guidance* to *control* to *power-assertive, negative, harsh control*. Reliability, weighted kappas, were .85–.86 for the naturalistic interactions and .65–.67 for the toy cleanup.

For each context, instances of each code were tallied (in naturalistic interactions, the tallies were then divided by the number of segments, as this could vary slightly). Those scores were then weighted to reflect the amount of control (*no control* multiplied by 1, *gentle guidance* by 2, *control* by 3, and *power-assertive control* by 4). In naturalistic interactions, mothers used more control than fathers, $t(185) = 2.01$, $p < .05$. In the toy cleanup, fathers used more control, $t(185) = -5.36$, $p < .001$. The scores were standardized.

Parents' intrusiveness. Intrusiveness was coded during a "teaching" context, in which the parent modeled simple play scripts and asked the child to imitate (5 min total). Intrusiveness was defined as a behavior that imposed the parent's agenda on the child, even if contrary to child wishes (Taylor et al., 2013). Intrusiveness was coded for each 30-s segment, as *none observed*, *low*, *moderate*, or *high*. Reliability, weighted kappas, were .70–.82.

Instances of each code were tallied and weighted to reflect the total amount of intrusiveness (*none observed* multiplied by 1, *low* by 2, *moderate* by 3, and *high*

by 4). Those scores were summed and divided by the total number of segments. Mothers' and fathers' scores were not significantly different. The scores were standardized.

Data aggregation. Again, we submitted the four measures of negative parenting to PCA with Varimax rotation. For both mothers and fathers, PCA recovered a single component, with higher scores clearly reflecting more negative parenting. All measures loaded positively, with loadings ranging .63–.75 for mothers and .58–.69 for fathers. For mothers, Eigenvalue was 1.83 with 45.78% of variance; for fathers, Eigenvalue was 1.71 with 42.66% of variance. Those components were used as the measure of the given parent's negative parenting.

Children's difficult temperament, 16 months

Children's proneness to anger. We observed the child's anger in the Car Seat episode from Lab-Tab (Goldsmith & Rothbart, 1999; Planalp et al., 2017). The child was buckled in a car seat for 60 s. Coders rated bodily anger (intensity of struggle, 0–4), facial anger (0–3), and vocal anger (0–3) in 5-s segments. Reliability, kappas, ranged from .68 to .87. Latency to express anger was also coded. Reliability, ICC, was .99. The standardized scores of bodily, facial, and vocal anger, and reversed latency were averaged into an anger composite ($\alpha = .79$).

Children's emotion dysregulation. In that same episode, coders rated overall emotion regulation (Perry et al., 2018) by coding behaviors such as looking away, thumb sucking, closing eyes, or any behavior that provides distraction from frustration, from 0 = u*nregulated*, to 1 = *mostly unregulated*, to 2 = *somewhat regulated*, to 3 = *mostly regulated*, to 4 = *well regulated*. Reliability, ICC, was .94. Scores were standardized and reversed to denote dysregulation.

Data aggregation. The two scores, not surprisingly, correlated highly, $r(187) = .89$, $p < .001$, and were averaged to denote children's difficult temperament.

Children's antisocial orientation, 52 months

Children's violations of parental prohibition. Near the end of the session, E asked the parent to remind the child of the prohibition regarding the attractive toys. The child was then alone for 8 min. In 5-s segments, child behavior was coded for Brief Touch = *touching object(s) on the shelf for less than 3 s*, and Long Touch = *touching object(s) on the shelf for 3 s or more*. Reliability, kappas, ranged from .81 to .87. Instances of brief touches and long touches were tallied, divided by the number of 5-s segments spent in the room, and summed to form the measure of violation of prohibition for the child with the given parent. Children's violations of mothers' and fathers' prohibition were not significantly different.

Children's rule-incompatible conduct. The child was asked to play a game to win a prize. The game required that the child guess which animals were hidden under scarves, while following the rules (not peeking under scarves or in the basket, only touching with a tip of one finger). The child was left alone for 3 min. Coders rated child

behavior as either compliant with rules or violating one or more rules for each 3-s segment. Codes for violations were tallied and divided by the number of segments when the child was actively involved in the game. Reliability, kappas, were .78 to 1.00. Latencies to the first violations were also coded. The standardized scores of rule-incompatible behaviors and (reversed) latencies were averaged into a composite of rule-incompatible conduct.

Children's moral self. E conducted a "puppet interview" (Kim & Kochanska, 2025; Kochanska, 2002; Kochanska et al., 2010). Two puppets presented 14 different items, describing moral behaviors and emotions. For each item, each puppet described self as representing the low or high end. E then asked the child which puppet was most like him or her. The child's response was coded as 0 = *choosing the puppet representing the low end*, 1 = *hesitating, choosing both*, or 2 = *choosing the puppet representing the high end*. Scores were then averaged across items.

Children's externalizing symptoms. Parents rated externalizing symptoms such as rule breaking, lying, and attention problems in the Strengths and Difficulties Questionnaire (SDQ; Goodman & Goodman, 2009) on a scale from 1 = *not true* to 3 = *certainly true*. We averaged across the 5 conduct problems items and 5 hyperactivity/inattention items to create the externalizing problems score for the given parent. Reliability, Cronbach's αs, were .80 and .75 for mothers and fathers, respectively. Mothers' and fathers' scores were not significantly different.

Data aggregation. We submitted children's scores of violations of the given parent's prohibition, rule-incompatible conduct, moral self, and the given parent's SDQ externalizing score to PCA with Varimax rotation. For both mother- and father-child dyads, the PCA recovered a single component, with higher scores clearly reflecting an antisocial orientation: Moral self loaded negatively, −.41 for mothers and −.57 for fathers, and the other three measures loaded positively, with loadings ranging .51–.76 for mothers and .52–.75 for fathers. For mothers, Eigenvalue was 1.55 with 38.72% of variance; for fathers, Eigenvalue was 1.61 with 40.18% of variance. Those components were used as the measures of the child's antisocial orientation (in mother- and father-child relationships).

Planned data analysis

We first conducted preliminary data analyses. Next, we proceeded to test a serial or sequential mediation model to examine the cascade, or a chain, from parents' insecurity to their hostile IWMs of their children to negative parenting to children's antisocial outcomes. This model allows us to elucidate the overall indirect effect of parents' insecurity on children's antisocial outcomes as mediated *through* several steps: from parents' insecurity to their IWMs, from IWMs to parenting, and from parenting to child outcomes. Additionally, we tested alternative potential paths (from parental insecurity to IWMs to child outcomes and from insecurity to parenting to child outcomes) that had been reported in previous studies.

To assess the potential moderating role of child temperament on this cascade, we tested whether the above mediated paths differ depending on child difficulty. Thus, we

proposed a moderated mediation model that examines the same indirect effect at different levels of children's difficult temperament (Hayes, 2022; MacKinnon, 2012). We expected that the proposed cascade would be most pronounced for children with difficult temperaments, prone to intense, dysregulated anger. In this model, child temperament was posited as a moderator of the relation between negative parenting and child antisocial orientation.

Results

Descriptive statistics and correlations

Descriptive statistics and correlations among study variables were computed in SPSS 30 (IBM Corp [IBM], 2024). Descriptive data and the respective *N*s are in Supplement 2, Table S2, and correlations are in Supplement 3, Table S3. All variables were within the acceptable range of skewness and kurtosis (skewness −3–3, kurtosis −10–10; Kline, 2023). In both mother- and father-child dyads, higher parental attachment insecurity was associated with more hostile IWMs of the child. Within mother-child dyads, hostile IWMs of the child were associated with more negative parenting, which was then associated with child antisocial orientation. Children with more difficult temperaments had higher scores on antisocial orientation in father-child dyads. Hostile IWMs, negative parenting, and child antisocial orientation were significantly correlated across mother- and father-child dyads.

Because the antisocial orientation scores in mother- and father-child dyads had two constructs in common (rule-incompatible conduct and moral self), we also examined separately the correlations for parent-specific scores (averaged violations of parental prohibition and externalizing rating for each parent) and for child-specific scores (averaged rule-incompatible conduct and moral self) with the remaining variables. The patterns of correlations were essentially the same, with no pairs of correlations being significantly different.

Testing the path from parental attachment insecurity to parental hostile Internal Working Model of the child to negative parenting to the child's antisocial orientation, and its moderation by child difficult temperament

Path models were estimated in Mplus 7 (Muthén & Muthén, 1998–2012) using codes adapted from Stride et al. (2015) with 5,000-sample bootstrapping. Using Little's (1988) missing completely at random (MCAR) test, data were considered MCAR in both mother-child, χ^2 (37) = 38.3, $p = .41$, and father-child, χ^2 (31) = 23.6, $p = .83$, models. Thus, to address missing data, we used a full information maximum likelihood estimator. Model fit was evaluated using the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) with its 90% CI. Model fit is considered good when CFI is larger than or equal to .95 and RMSEA is less than or equal to .05 and acceptable or mediocre when CFI is larger than or equal to .85–.90 and RMSEA is less than or equal to .08 (Hu & Bentler, 1999; Little, 2013).

We tested two models – first, without the moderator, and second, with the moderator. Parental attachment insecurity measured at 8 months was modeled as

the predictor of child antisocial orientation at 52 months, with parental hostile IWMs and negative parenting at 16 months as serial mediators. Child difficult temperament at 16 months was modeled as the moderator of the relation between parental negative parenting and child antisocial orientation. Children's gender was covaried. Significance of mediation and moderated mediation was tested using their bias-corrected 95% confidence intervals (CI; Hayes, 2022). For significant moderation, simple slopes were probed and plotted at 1 *SD* below and 1 *SD* above the mean of the moderator, child difficult temperament (Aiken & West, 1991).

Mother-child dyads

We began by addressing our first aim – to test the significance of sequential mediation from maternal insecurity to hostile IWMs of the child to negative parenting to the child's antisocial orientation. Model fit was acceptable, CFI = .95, RMSEA = .10 [.00, .24]. There was no significant direct effect of maternal attachment insecurity to their own parents at 8 months on child antisocial orientation at 52 months. Higher maternal attachment insecurity predicted more hostile IWMs of the child at 16 months, $B = 0.30$, $SE = 0.08$, $p < .001$, 95% CI [0.16, 0.48], but not negative parenting at 16 months.

Maternal hostile IWMs of the child at 16 months were associated with more negative parenting at 16 months, $B = 0.17$, $SE = 0.08$, $p < .05$, 95% CI [0.003, 0.327], but not with children's antisocial orientation at 52 months. The relation between maternal negative parenting at 16 months and children's antisocial orientation at 52 months was positive, $B = 0.24$, $SE = 0.13$, $p = .06$, 95% CI [0.03, 0.53]: More negative parenting was related to higher antisocial orientation.

The proposed sequential mediation from maternal attachment insecurity to hostile IWMs to negative parenting to child antisocial orientation was significant, $B = 0.01$, $SE = 0.01$, 95% CI [0.001, 0.053]. We found no evidence of other significant mediated paths.

Next, we addressed our second aim – to examine whether the mediation was conditional upon children's difficult temperament (thus including difficult temperament as a moderator). The results, with all path coefficients, are presented in Figure 2.

The final model fit the data well, CFI = 1.00, RMSEA = .00 [.00, .07]. Specific path coefficients and their significance were almost identical to those in the first model without the moderator. We again identified a significant indirect path from mothers' attachment insecurity to IWMs of their children to negative parenting to child antisocial orientation, $B = 0.01$, $SE = 0.01$, 95% CI [0.001, 0.049].

Additionally, we found significant moderation effects by children's difficult temperament. The relation between maternal negative parenting at 16 months and children's antisocial orientation at 52 months was moderated by children's difficult temperament, while the main effect of maternal negative parenting on child antisocial orientation remained significant.

Figure 3 graphs that interaction effect using simple slopes (Aiken & West, 1991) for children varying in difficult temperament. More negative parenting was associated with higher antisocial orientation for children with more difficult temperaments, $B = 0.44$, $SE = 0.20$, $p < .05$, 95% CI [0.09, 0.84], but not for children with less difficult temperaments.

Based on significant moderation, we tested whether significant mediated paths found in the first model were moderated by child difficult temperament. Moderated mediation

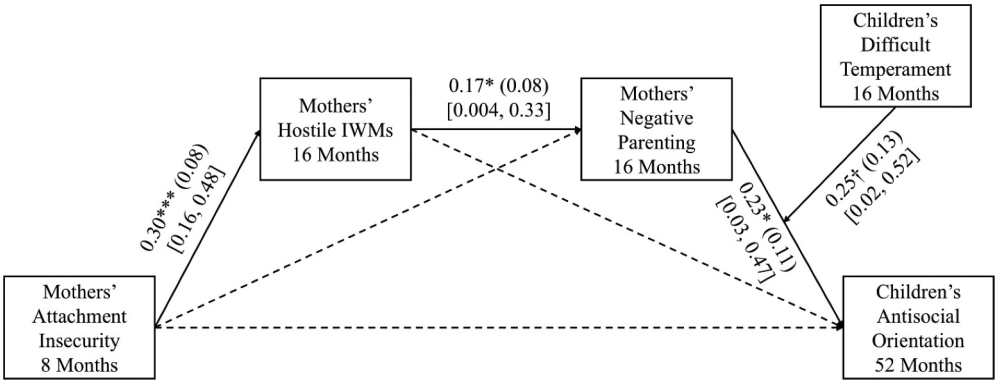

Figure 2. Cascade from mothers' attachment insecurity to their hostile internal working Models of the child to negative parenting to future children's antisocial orientations, moderated by children's difficult temperament. IWM = Internal Working Model. Unstandardized coefficients (standard errors in parentheses and 95% confidence intervals in brackets) are presented. Child gender was covaried but not depicted. †$p = .06$. *$p < .05$. ***$p < .001$. An overall indirect effect of mothers' insecurity on children's outcomes (antisocial orientation), from mothers' insecurity to their hostile IWMs, from hostile IWMs to negative parenting, and from parenting to children's outcomes, was present. Child difficult temperament moderated the overall indirect effect such that the cascade was significant at high, but not low, levels of child difficulty. Alternative potential mediated paths (from maternal insecurity to IWMs to child outcomes and from insecurity to parenting to child outcomes) were also tested but were non-significant.

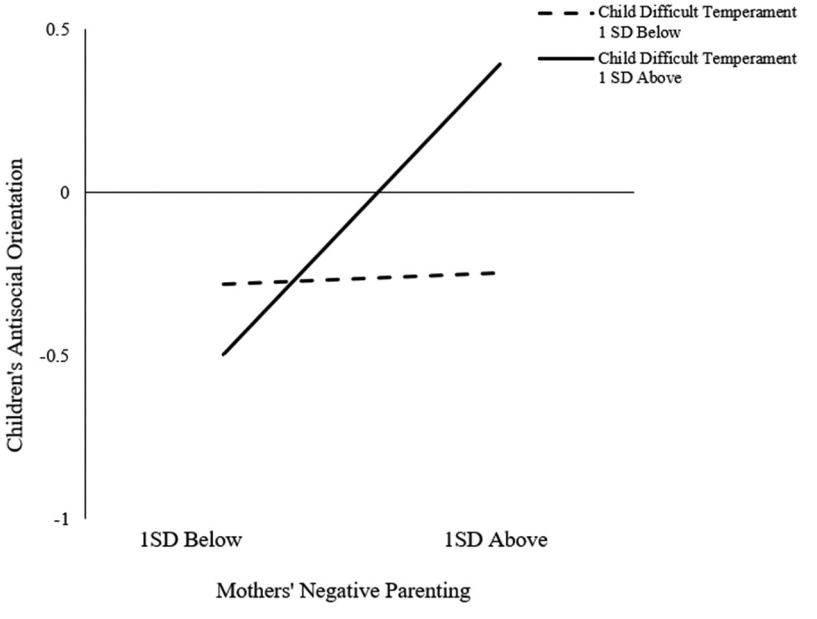

Figure 3. Relation between mothers' negative parenting and child antisocial orientation, moderated by child difficult temperament. A simple slope at 1 *SD* above the mean was significant at $p < .05$.

from maternal attachment insecurity at 8 months to maternal negative parenting at 16 months to child antisocial orientation at 52 months was not significant. However, moderated mediation for *the entire path* from maternal attachment insecurity to hostile IWMs of the child to negative parenting to child antisocial orientation was significant; index of moderated mediation, $B = 0.01$, $SE = 0.01$, 95% CI [0.001, 0.054]. For children with more difficult temperaments (1 *SD* above), the indirect effect was significant, $B = 0.02$, $SE = 0.02$, 95% CI [0.003, 0.090]. In contrast, the indirect effect was not significant for children with less difficult temperaments (1 *SD* below).

Father-child dyads

We again tested two models – one without the moderator (child difficult temperament) and the other with the moderator. The first model fit the data well, CFI = 1.00, RMSEA = .00 [.00, .12]. There was no direct effect of paternal attachment insecurity to their own parents at 8 months on children's antisocial orientation at 52 months. Higher paternal insecurity was predictive of more hostile IWMs of the child at 16 months, $B = 0.28$, $SE = 0.08$, $p < .001$, 95% CI [0.13, 0.44], but not of negative parenting at 16 months. Paternal hostile IWMs of the child at 16 months were unrelated to negative parenting at 16 months but positively associated with children's antisocial orientation at 52 months, $B = 0.18$, $SE = 0.07$, $p < .05$, 95% CI [0.04, 0.32]. There was an indirect effect of parental insecurity on child antisocial orientation, mediated through paternal hostile IWMs, $B = 0.05$, $SE = 0.03$, 95% CI [0.01, 0.11]. More insecure fathers had more hostile IWMs of their children, and those IWMs, in turn, were associated with children's higher antisocial orientations.

Next, we addressed our second aim – to examine whether the mediation was conditional upon children's difficult temperament (thus including difficult temperament as a moderator). The results are presented in Figure 4.

The fit of the second model with the moderator included was acceptable, CFI = 0.85, RMSEA = .07 [.01, .13]. The path results from the first model were replicated. The expected indirect path from fathers' attachment insecurity to hostile IWMs of their children to parenting to child antisocial orientation was not found. However, there was an indirect effect of parental insecurity on child antisocial orientation, mediated through paternal hostile IWMs, $B = 0.05$, $SE = 0.03$, 95% CI [0.01, 0.11]. We found no evidence of significant moderation by the child's difficult temperament or moderated mediation for the entire tested path.

Additional analyses: Testing the paths from parental avoidant and anxious attachment to parental hostile Internal Working Model of the child to negative parenting to the child's antisocial orientation, and their moderation by child difficult temperament

Because differences in relations between the two aspects of adult insecurity and parenting have been reported (Jones et al., 2015), we conducted all analyses separately for those two dimensions. Those analyses, for both mother-and father-child dyads, are presented in Supplement 5. The findings were essentially parallel with each other and with the main presented analyses using the combined insecurity construct.

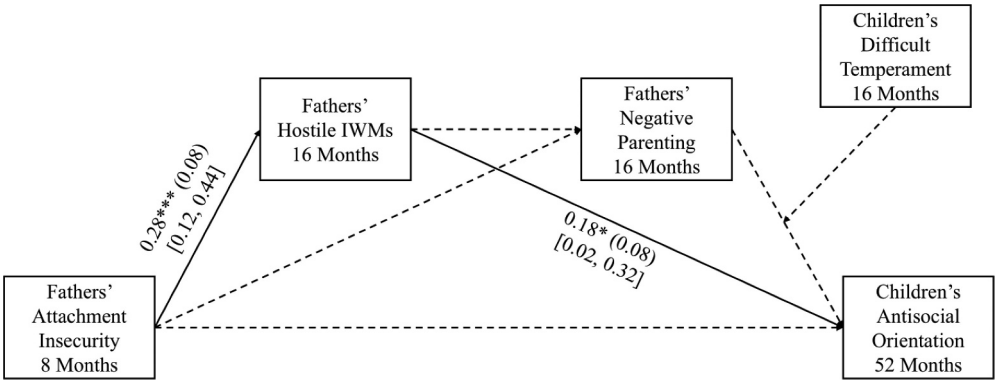

Figure 4. Cascade from fathers' attachment insecurity to their hostile internal working Models of the child to negative parenting to future children's antisocial orientations, moderated by children's difficult temperament. IWM = Internal Working Model. Unstandardized coefficients (standard errors in parentheses and 95% confidence intervals in brackets) are presented. Child gender was covaried but not depicted. *$p < .05$. ***$p < .001$. The overall indirect effect of fathers' insecurity on children's outcomes (antisocial orientation), from fathers' insecurity to their hostile IWMs, from hostile IWMs to negative parenting, and from parenting to child outcomes, was non-significant. Child difficult temperament did not moderate this cascade. An alternative indirect effect from fathers' insecurity to children's outcomes through hostile IWMs was present.

Discussion

This work addressed two major aims. The first aim was to examine the proposed cascade from parents' insecure attachment to their hostile IWMs of the child to negative parenting to children's antisocial orientations, covering the age span from infancy to preschool age. Although the extant studies have produced compelling evidence in support of some parts of that developmental path, the innovative aspect of the current work is to test the comprehensive model that includes all the proposed constructs tested sequentially in the developmental cascade. To our knowledge, this is the first such attempt, and an extension of our earlier study (An & Kochanska, 2022), which tested a path from parents' insecurity to hostile IWMs to power-assertive parenting, but did not examine future child outcomes. Note also that this goal embraces several directions articulated by the influential review by Jones et al. (2015). The authors urged researchers to: (1) integrate self-reported parental attachment styles with observational research on parenting, commenting that the extant evidence was highly compelling; (2) use dimensional rather than categorical parental attachment measures, with ECR-RS (Fraley et al., 2011) considered one of the broadly used instruments with robust psychometric qualities; (3) include both mothers and fathers; (4) examine parents' internal representations of the child as potential mediators linking parents' attachment styles and parenting; and (5) deploy longitudinal designs. ECR-RS targets participants' attachment-related avoidance and attachment-related anxiety toward one's parents or parent-like figures, romantic partners, or friends, assuming that those mental representations have largely enduring and generalized qualities, consistent with Bowlby's and other attachment researchers' views.

The second aim was to incorporate evidence from extensive research on child temperament into our model of the proposed developmental cascade. That research has

persuasively demonstrated that qualities of caregiving and parenting impact differently children with varying biologically based temperaments. As supported by large literature, we targeted the child's proneness to anger and poor anger regulation, most commonly implicated as moderating effects of parenting (Belsky & Pluess, 2009; Kiff et al., 2011; Morris et al., 2002; Rothbart & Bates, 2006; Sanson et al., 2004; Slagt et al., 2016; van Zeijl et al., 2007). We expected that the detrimental developmental effects of the cascade from parents' insecurity to their hostile IWMs of the child to negative parenting to children's antisocial orientation would be significantly stronger for children who were highly prone to anger dysregulation, compared to their less anger-prone peers.

We adopted a multi-method, multi-trait approach. We collected parents' reports and observational measures of parents' and children's behavior, and we targeted multiple aspects of the measured constructs, all implicated in the origins of disruptive orientations in children: parents' implicit negative relational schema along with explicit resentment and hostile attributions (Garon-Bissonnette et al., 2024; Kochanska et al., 2019), and unresponsiveness, power assertion, and intrusiveness, traditionally considered key aspects of negative parenting (Grolnick & Pomerantz, 2009; Maccoby & Martin, 1983). We also targeted several aspects of children's antisocial orientations: rule-breaking conduct, parents' perceptions of externalizing problems, and children's self-descriptions regarding moral dimensions.

For both mother- and father-child dyads, we found evidence of mediated pathways from parents' attachment styles to children's antisocial outcomes; however, the pathways were only partly the same. For mother-child dyads, the results were straightforward and consistent with expectations. The anticipated sequential mediation cascade was present, and all expected consecutive links were significant. More insecure mothers of infants had more hostile IWMs of the child at early toddler age; in turn, mothers with more hostile IWMs engaged in more negative parenting, which predicted more disruptive, externalizing child behavior at preschool age. And we supported the expected moderated mediation cascade: That entire pathway was present only for children who were more anger prone, but not for those who were less anger prone.

The findings for father-child dyads partially replicated those for mothers and children. We did identify a mediational path from fathers' insecurity in infancy to children's antisocial orientation at preschool age that provided a partial support of our model: Fathers' insecurity predicted their hostile IWMs, which in turn predicted children's antisocial orientation, but negative parenting was not a component of that sequence. We did not support moderated mediation: Child temperament did not serve as a moderator. However, for both parents, we supported the key role of early parental insecure attachment, followed by their hostile IWMs of the child, as setting the stage for maladaptive developmental cascades.

How can we explain the different findings for fathers? Several mechanisms, unmeasured in this study, linking fathers' insecurity with children's outcomes, may be involved. Insecure fathers with hostile mindsets may serve as models of aggressive, antisocial behaviors that are not necessarily part of parenting. That behavior can then directly influence children's antisocial orientation. Coley et al. (2011) found little evidence of indirect relations from parental antisocial behaviors to parenting to child behavioral problems in father-child dyads. Rather, they found significant relations between higher paternal antisocial behaviors and children's behavioral problems, even after controlling

for a variety of covariates. For mothers, however, their parenting behaviors (i.e., harsh discipline and warmth), not antisocial behaviors, had significant effects on children's behavioral problems. Likewise, Fields et al. (2025), studying paths from parents' characteristics to marital conflict to harsh parenting to child antisocial behavior found that the final direct link was significant only for mothers. More generally, parental insecurity and their hostile IWMs may exert their detrimental effects on children not only via negative parenting, but also via parents' expressed negative emotions, such as anger, or negative family climate to which the child is exposed at home (Cummings & Davies, 2002).

Explaining why child difficult temperament served as a moderator only in mother-child dyads is difficult, given that research on interactions of child temperament and fathers' parenting continues to be scarce. But other studies have reported similar patterns, with the child's temperament moderating the effects of parenting only for mothers and children (Bendel-Stenzel et al., 2022; Kim & Kochanska, 2012; Ng-Knight & Schoon, 2021; Wittig & Rodriguez, 2019). Perhaps, the difference was due to the mothers being largely the primary caregivers in this study. Consequently, their parenting may have encompassed more daily contexts and more time in their children's lives than fathers' parenting. Note that although for mothers and children the entire cascade from maternal insecurity to child antisocial orientation was significant only for difficult children, the moderation effect of child temperament was detected only for the negative parenting – antisocial orientation link, and as aforementioned, negative parenting was unrelated to children's outcomes in father-child dyads. It is apparent that, despite challenges involved in recruiting families in which both parents commit to participating, research that explores similarities and differences in socialization processes in the two relationships remains crucial.

This work has limitations. Racial and ethnic diversity was limited, although 20% of families were not "White alone," and they were representative of the area of the U.S. where they lived. The families were considered low risk: The infants were typically developing, and the parents were generally gentle, responsive, and not intrusive, and viewed their children positively. Children were overall successfully socialized. Although we were still able to support our hypotheses, future studies would benefit from including higher-risk families, characterized by elevated parental or child psychopathology, or those exposed to significant ecological adversity (poverty, chaos, violence, or stress).

We focused on parents' insecurity to their own parents by averaging the (robustly correlated) dimensions of avoidance and anxiety. This approach, however, may have obscured differences in the relations those two attachment dimensions may have with parental IWMs of the child, parenting, and child difficult temperament (Cassidy et al., 2011; Gross et al., 2023; Jones et al., 2015). To explore this question, we conducted additional analyses, parallel in the statistical approach, separately for the two dimensions (Supplement 5). For both mother- and father-child dyads, the comparisons of the findings using attachment avoidance and those using attachment anxiety with the findings using insecurity composite indicated that the patterns were essentially the same. Nevertheless, this is potentially an important research question for future exploration.

This research can inform translational applications by elucidating several potential windows for interventions to offset negative developmental trajectories, especially for children highly prone to anger dysregulation, a known transdiagnostic risk factor (Finlay-Jones et al., 2024). Intervention programs targeting parental hostile IWMs

have proven effective (Camoirano, 2017; Myers et al., 2022; Suchman et al., 2017), as have early interventions targeting parenting, decreasing children's maladaptive outcomes and promoting adaptive ones (e.g. Calderone et al., 2025; Hyde et al., 2025; Jeong et al., 2021; Leijten et al., 2019; McMahon & Forehand, 2005). Importantly, evidence indicates that interventions might be more effective for children with more behavioral or temperamental difficulties (Brock & Kochanska, 2016; Cassidy et al., 2011; Hustedt et al., 2024; Reid et al., 2004), although mixed results exist (e.g., Shelleby & Shaw, 2014). Perhaps combining interventions that target both parental IWMs and behavior may produce most beneficial results, especially for children with difficult temperaments.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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