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Paternal Anxiety in Relation to Toddler Anxiety: The Mediating Role of Maternal Behavior

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Abstract

Despite robust investigations examining the impact of maternal anxiety and parenting behaviors and child anxiety risk, less is understood about the impact of paternal anxiety and parenting behaviors on child anxiety risk, particularly within the broader family context. An Actor Partner Interdependence Model (APIM) was used to examine whether paternal anxiety longitudinally predicted child anxiety risk indirectly through maternal and paternal parenting behaviors, while controlling for maternal anxiety. Both fathers and mothers of 12- to 30-month-olds ($n = 94$) provided self-report of their anxiety and parenting behaviors. Child inhibited temperament (i.e., anxiety risk) was coded. Two APIMs separately considering encouragement of independence and overprotection were examined. These models revealed no direct relation between parent and child anxiety while controlling for parenting behaviors. Models did suggest that paternal anxiety is indirectly linked with future child anxiety through lower maternal encouragement of independence, but not through maternal overprotection or paternal parenting behaviors.

Keywords

anxiety; fathers; families; parenting; toddlers

Childhood anxiety disorders affect 5–17% of children and are associated with delayed development of emotion regulation skills, poor adjustment in school, and difficulties forming peer relations [1, 2]. Anxiety often aggregates within families, as children of parents with clinical anxiety are at an increased risk of developing anxiety-spectrum disorders throughout their lifespan [3–6]. Even non-clinical factors such as maternal trait anxiety [7] and negative affectivity [8] are strongly associated with anxiety symptoms in children. Despite this, many extant investigations focus on clinical levels of parental anxiety rather than these typical trait-like symptoms, which may better characterize typical family functioning. Given that heritability estimates of anxiety are modest [9], environmental factors such as parental behaviors, modeling, and broader family functioning likely influence anxiety's intergenerational transmission [10, 11]. These parenting behaviors are certainly further influenced by the parents' own anxiety symptoms [12, 13]. Research has been limited by its nearly exclusive investigation of maternal anxiety and parenting behaviors on anxiety

development, despite work highlighting the unique role of paternal anxiety and parenting behaviors in the development of child anxiety [11, 14, 15]. Additionally, very few empirical investigations have considered maternal and paternal anxiety symptoms and parenting behaviors simultaneously to account for their interdependence. This investigation utilizes a model to account for the interdependent effects within a community sample of parent dyads to predict the development of anxiety risk in young children.

Parenting Behaviors Associated with Risk of Anxiety Development

Much of the current literature on environmental influences on child anxiety focuses on parenting behaviors. One category of behaviors that is associated with anxiety development is parental overcontrol (e.g., low encouragement of independence, overprotection), which encompasses parenting behaviors that restrict children from exploring novel and ambiguous situations, thereby increasing the child's perceptions of threat and danger in unfamiliar situations [16]. Restriction of a child's autonomy and independence in potentially stress-evoking circumstances prevents the child from learning social and emotion-regulation skills that could otherwise be practiced and developed in such situations. Overcontrol also teaches that a pattern of avoidant responding is acceptable when threatened, thereby increasing risk for anxiety [14, 17]. Parents may engage in overcontrol in attempt to reduce or manage their child's distress in stressful situations, though these behaviors may actually serve to reinforce a child's anxiety by limiting her or his ability to cope independently in the future [18, 19].

Such controlling parenting behaviors occur with a greater frequency in children with an inhibited temperament [10, 20, 21]. Temperamental inhibition reflects a biologically-based disposition to respond to novel situations and people with wariness and distress [22] and places children at an increased risk for anxiety spectrum problems across the lifespan [23, 24]. As such, temperamental inhibition provides an appropriate parameter of future anxiety risk in the toddlerhood period [25]. As a measure of temperament, inhibition is expected to be relatively stable, but temperament theorists agree that the environment can affect its display [23, 26, 27]. Multiple robust investigations confirm that overcontrolling parenting behaviors do increase symptoms of anxiety and exacerbate behavioral manifestations of inhibited temperament in young children [16, 28].

The majority of research on parenting in relation to child anxiety risk has focused on the influences of maternal parenting [29]. Mothers are crucial in facilitating the development and socio-emotional growth of their children [8]. In most cases, mothers also serve as "safe and secure" bases from which children can explore, with children knowing that the mother can provide support and protection should danger arise. In ambiguous and novel situations, children often reference their mothers for help in deciding the best ways to respond, allowing the mother to scaffold the development of adaptive coping strategies [30, 31]. When the mother fails to encourage independence or responds with overprotection, however, the child learns to rely on the mother and fear potentially distressing situations, which is maladaptive for the child's emotional development. These controlling parenting behaviors occur with greater frequency among anxious mothers as well as mothers of anxious children [10, 18, 32]. A more adaptive maternal response to such novel and potentially distressing situations is gently encouraging the child to engage with the unfamiliar situations, thereby

promoting independence and mastery. Indeed, gentle encouragement and lack of overcontrol have been associated with decreased anxiety risk in the early developmental period [16, 33]. Though such research may help to explain the intergenerational transmission of anxiety from mothers, the literature's myopic focus on maternal parenting has neglected to account for other caregiver influences on child anxiety development.

The Role of Paternal Parenting on Anxiety Development

Few parallel investigations to those conducted with mothers have investigated the association between paternal parenting behaviors and child anxiety. Recent theoretical models propose that fathers play an integral and distinct role in the development of anxiety in their children [29, 34]. Several studies have suggested that fathers' relationships with their children may center more upon play behaviors than caretaking [29, 35, 36]. Paternal play, which is characterized by spontaneity, unpredictability, and competitiveness, facilitates the child's development of autonomy, exploration, and comfort in approaching novel situations [19, 29, 36]. Although this play construct has been defined differently in the literature (e.g., rough-and-tumble play, challenging play behavior), it is generally displayed by fathers of younger children, particularly in the preschool developmental period [19, 37]. Fathers may therefore play an instrumental role in providing their young children with the skills needed to cope with the external world and potentially stressful or ambiguous situations [29, 34]. In support of this, research has shown that children reference their fathers more than their mothers in novel social situations that might arouse anxiety [38] and that anxious children, specifically, may be more influenced by paternal behaviors in ambiguous situations [30]. Through play, fathers therefore encourage independence, exploration, and flexibility, which subsequently decreases anxiety risk in contexts that mimic the potential uncertainty of the external world [34].

The few existing investigations of fathers provide results consistent with theory about the importance of paternal encouragement of independence. One investigation found that children of fathers who challenge their children to engage with novel stimuli and situations are at a decreased risk of anxiety in the preschool period [19]. Specifically for infants, anxious expressions from the father during a visual cliff experiment were associated anxiety expressions in infants, whereas maternal expressions were not [39]. Further, paternal overinvolvement emerged as the most potent predictor of anxiety in young children while controlling for maternal and paternal psychopathology and other maternal parenting behaviors [13]. This suggests that paternal influences are important to consider, though more work is needed to more comprehensively understand the multiple, interactive factors responsible for paternal influence on child anxiety development.

Paternal anxiety may be one reason why fathers do not encourage these autonomous behaviors in their children. Multiple investigations have found that fathers with anxiety are less likely to encourage child independence and also more likely to be overprotective or controlling [13, 15, 38]. Other investigations, however, have not found this expected association between paternal anxiety and anxiety-relevant parenting behaviors [13, 35, 40]. It is possible that paternal anxiety may serve a more indirect role in the development of child anxiety by impacting broader family functioning.

The Parental Dyad and Child Anxiety Development

The reviewed literature has examined fathers and mothers in isolation, leaving it unclear how aspects of paternal and maternal anxiety influence each other's parenting. It is likely that fathers and mothers influence each other's parenting in specific ways that ultimately impact child anxiety development [41]. Several investigations have examined the role of broader family factors including co-parenting and parental support and suggest that general family cohesiveness serves a protective function between environmental risk factors and future anxiety symptoms in children [41, 42]. It is therefore crucial to understand the interdependence between mother and father behaviors when examining developmental processes within families. One such study simultaneously investigated the role of maternal and paternal parenting behaviors and anxiety disorder status on child anxiety symptom outcomes across 6 to 15 year olds. This investigation found that anxiety was maintained when mothers were low in autonomy granting and the child was insecurely attached to the father [43]. Less is known about the roles of parental anxiety symptoms and behaviors in younger samples when parenting is particularly salient for anxiety risk [2, 11]. One study of preschool children and their parents found that parental overprotection related to child anxiety risk when assessed separately through both maternal and paternal report [44]. Important next steps along these lines is considering mothers and fathers in the same model, and including a measure of child anxiety risk that is not dependent on parental report (i.e., through observation of temperamental risk for anxiety).

Recent approaches have adopted an Actor-Partner Interdependence Model (APIM) to account for interdependent and transactional influences between dyad members, such as two parents within the same family [45–47]. This model implies that the actor's, or one parent's, anxiety not only affects their own parenting behaviors, but also influences the partner's, or other parent's, behaviors. It is through this mutual interaction that the parenting dyad influences the development of anxiety in children. Existing models of anxiety development have, therefore, been very limited in their comprehensiveness and scope because they did not account for this mutual interdependence in investigating each caregiver's contribution their child's anxiety.

Although the research reviewed above suggests that fathers' anxiety may directly reduce their own encouragement to approach and interact with novelty, Bögels and Phares (2008) incorporated an interdependent framework and provided another possible mechanism through which anxiety is transmitted to children from their parents [29]. When fathers' own anxiety inhibits their abilities to encourage children's engagement in developmentally appropriate yet novel activities, mothers may also decrease their encouragement of independence and engage in more overprotection to ensure child well-being [29, 34]. As a result, perhaps mothers react to anxious fathers by further reducing encouragement of independence or displaying more pronounced overprotection [34], thereby exacerbating risk for child anxiety [2, 19]. Bögels and Perotti (2011) theorized that maternal anxiety would not function in a parallel manner because the maternal evolutionary role has been to manage the internal world (e.g., feeding, comforting) rather than the external interactions relevant for anxiety development [34]. Indeed, empirical work supports this theory and demonstrates that paternal anxiety, but not maternal anxiety, negatively affects both parents' anxiety-relevant

parenting behaviors [12]. This is consistent with the crossover effect from family systems theory (and the “partner” effect from APIM), which suggests that one parent’s intrapersonal difficulties (such as anxiety) may affect the other parent’s relationship with the child [48]. This may occur alongside spillover effects (“actor” effects in APIM), in which a parent’s intrapersonal difficulties affect his or her own relationship with the child [48]. To isolate this crossover mechanism, it is therefore important to use an APIM framework to simultaneously model actor and partner effects that then relate to child anxiety risk.

The Current Study

Investigating child anxiety risk in toddlerhood while accounting for the interdependent impact of both fathers and mothers is crucial yet underexamined. Further, examining such relations in a community sample is important to establish risk for problems before they reach clinical significance, which will best inform prevention efforts. The present study adopts an APIM framework to investigate whether non-clinical levels of paternal anxiety relate indirectly to child risk for anxiety through fathers’ own as well as mothers’ overcontrolling parenting behaviors (i.e., encouragement of independence, overprotection), while also accounting for complementary processes arising from maternal anxiety. Because encouragement of independence and protection are strongly (negatively and positively, respectively) associated with anxiety development in children [16, 49], we hypothesized that paternal anxiety would predict lower levels of paternal and maternal encouragement of child independence and higher levels of paternal and maternal overprotection, which would then relate to higher child temperamental risk for anxiety one year later. Thus, we hypothesized that paternal and maternal encouragement of child independence and overprotection would longitudinally serve as an indirect means through which paternal anxiety relates to child risk for anxiety.

Method

Participants

Mothers, fathers, and their children were recruited for a larger study of children’s anxiety development based on birth announcements in local newspapers, from flyers posted in the community, and in-person at a local Women, Infants, and Children program. Ninety-four families were eligible for the current study due to the participation of both fathers and mothers. Families joined the study when toddlers (36 female) were between 12 and 15 months ($n = 60$; $M = 14.11$ months, $SD = 1.34$ months) or between 24 and 30 months ($n = 34$; $M = 26.59$ months, $SD = 1.93$ months). Mothers in this sample were 92.55% European American; 4.26% Asian/Asian American; 1.06% African American/Black; and 2.13% Hispanic/Latina. Fathers in this sample were 90.43% European American; 1.06% Asian/Asian-American; 1.06% Native American/American Indian, 1.06% Hispanic/Latino, 4.26% African-American; 1.06% multiracial, and 1.06% identified as “other” racial/ethnic identity. For fathers and mothers, respectively, 3.2% and 2.1% reported less than a high school education, 21.3% and 9.6% had a high school diploma, 5.3% and 11.7% had some college, 10.6% and 4.3% had an Associate’s degree, 28.7% and 37.2% had a college degree, 26.6% and 31.9% had a master’s or doctoral degree, and 4.3% and 3.2% did not indicate their

education level. Gross annual household income ranged from less than \$15K to greater than \$100K, with average income falling in the range of \$51–60K/year. Approximately one year after participating in the initial phase of this investigation, participants were invited for a follow-up visit. Sixty-eight families (72%) participated.

Procedures

All procedures were fully approved by the associated university's Institutional Review Board. Before coming to participate in the laboratory, families were mailed packets containing consent forms and a variety of questionnaires for mothers and fathers to complete individually. After signing the written consent forms, mothers and fathers completed these questionnaires on their own time, and mothers brought the completed packets with them to the laboratory.

At the follow up laboratory visit approximately one year later, children participated in a variety of tasks. Informed consent was again obtained from the parents of toddlers participating in the study. The current study focuses on a Risk Room paradigm used for the observation of inhibited temperament, our operationalization of anxiety risk. In this task, the experimenter showed the mother and child into a large room filled with five activities that all involved an element of risk taking (tunnel, low balance beam, exercise trampoline, “scary” black box with painted eyes and cut-out jagged teeth, and a lion mask on a pedestal). The experimenter instructed the mother to sit on a chair and read a magazine, limiting spontaneous interactions with her child, and instructed the child to play “however you like” for 3 minutes. The task was video recorded for later scoring.

Coders were trained by a master coder and required to achieve minimum inter-rater reliability (ICC or kappa > .80) prior to coding independently. The master coder double-scored approximately 20% of cases and met with coders throughout coding to discuss discrepancies to prevent coder drift. Final reliabilities were calculated prior to any resolution of different scores and are presented in the description of the scores used for the measure below.

Measures

Maternal and paternal anxiety—The Depression Anxiety Stress Scales (DASS) is a 21-item self-report measure developed by Lovibond and Lovibond (1995) that aids in the diagnosis of anxiety and depression [50]. On a scale from 0 (*did not apply to me at all*) to 3 (*applied to me very much*), participants indicated how often a number of statements applied to them over the past week. For the purposes of this study, only the anxiety-relevant items ($n = 7$) were examined for analyses. A few of the anxiety statements on the DASS include “I felt I was close to panic,” “I experienced trembling,” and “I felt scared without any good reason.” Chronbach's alphas for mothers' and fathers' responses to the anxiety items were .93 and .55, respectively. Maternal and paternal anxiety variables were calculated by summing all of the items on the anxiety scales and multiplying by two [50].

Parenting behavior—The Child Rearing Practices Report (CRPR) is a self-report measure of various parenting behaviors developed by Block (1965) and further specified into

factors by Rickel and Biasatti (1982) [51, 52]. On a scale from 0 (*strongly disagree*) to 6 (*strongly agree*), mothers and fathers indicated how strongly they agree with a number of statements that could apply to their own parenting. The current study uses scales of Encouragement of Independence (7 items; e.g., “I let my child make decisions for him/herself,” “I encourage my child to be independent of me”) and Overprotection (4 items; e.g., “I try to stop my child from playing rough games or doing things where s/he might get hurt”). Responses were summed to create encouragement of independence and overprotection total scores for each mother and father. The CRPR was originally developed as a Q-sort, a forced-ranking method resulting in low correlations among items. Therefore, individual items contribute to the overall construct but are not expected to be highly related to one another, which empirically has been found in previous research using this measure [53]. In this case, summing items is an appropriate method of aggregation (consistent with a “causal indicator” measurement model) [54], but internal consistency is not expected, so Cronbach alphas were not calculated.

Child anxiety risk—Child anxiety risk was derived from four observed behaviors in the Risk Room. The first of these was the latency in seconds to the child’s first intentional contact with one of the five activities (ICCs = .99). Children were scored for the time, in seconds, spent playing with any of the objects (ICCs = .85 to .95) and the number of activities with which they engaged (ICCs = .87 to 1.00), both of which were then reverse-scored. Finally, coders scored the number of seconds spent in proximity to their mothers without playing (ICCs = .96 to .99). These behaviors (reversed as necessary) correlated .25 to .58 (all p s < .05), and a principal components analysis suggested that they loaded on a single component that explained 54.42 % of the variance (loadings = .58 to .83). Therefore, the four behaviors were standardized and averaged to yield the final variable of child anxiety risk.

Data Analysis Plan

We first performed preliminary analyses to describe the primary variables and address any concerns about their univariate and multivariate normality, as well as assess for missing data. We also tested correlations to understand the nature of bivariate relations among variables and identify potential covariates for primary analyses. Path models that incorporated the APIMs of maternal and paternal anxiety and parenting behavior, as well as child anxiety risk, were tested using MPlus Version 7.3 [55]. Separate models were tested for encouragement of independence and overprotection. Each model simultaneously accounted for “actor” effects (e.g., paternal anxiety predicting paternal parenting) as well as “partner” effects (e.g., paternal anxiety predicting maternal parenting). Parenting behaviors from both parents were also modeled as predictors of child anxiety risk. Overall model fit was assessed through a variety of metrics (with values indicating adequate model fit in parentheses), including the chi-square test (non-significant values indicate adequate model fit), comparative fit index (CFI; > .90), Tucker-Lewis Index (TLI; > .90), root mean square error approximation (RMSEA; < .08), and standardized root mean square residual (SRMR; > .08) [56]. Individual paths were tested, and indirect effects from parent anxiety to child anxiety risk through parenting behavior were estimated for both parents through both actor and

partner paths. These indirect effects were tested using 95% bias-corrected bootstrapped confidence intervals created from 5000 bootstrapped samples.

Results

Preliminary Analyses

All endogenous variables (mediators and outcomes) demonstrated adherence to normal distributions (skew $< |2.00|$). Mahalobis's Distance was used to identify multivariate outliers. Four cases were removed for further analyses based on significant values ($p < .05$). Descriptive statistics for the remaining sample are reported in Table 1.

Primary variables did not differ between families who were recruited at child age 12–15 months and families recruited at child age 24–30 months (all t s < 1.62 , all p s $> .10$). Therefore, data were analyzed together. Table 2 displays correlations among major variables. Neither paternal nor maternal anxiety related directly to child anxiety risk. This, however, does not preclude the possibility of indirect effects from parental anxiety to child anxiety [57]. Paternal anxiety related to lower maternal encouragement of independence. Mothers and fathers tended to covary in their encouragement of independence, and each parent's score on encouragement of independence related negatively to their own overprotection scores. Maternal encouragement of independence had a negative relation to child anxiety.

We also investigated whether demographic variables (child gender, SES [a composite of standardized scores of paternal education, maternal education, and gross family income], and number of siblings) related to endogenous variables (mediators and outcomes) and so should be included as covariates in primary analyses. SES related to paternal ($r = 0.23$, $p = .030$) and maternal ($r = 0.29$, $p = .006$) encouragement of independence, so SES was included in the model including encouragement of independence. Neither number of siblings (all t s $< .17$, all p s $> .10$) nor child gender (all t s < 1.05 , all p s $> .30$) related to mediator or outcome variables, so they were not considered further.

A very small amount of missing data occurred for variables derived from the initial assessment. One mother and one father (from separate families) were missing their anxiety measures, and one family was missing a measure of SES. A number of participants were lost to attrition between the initial and follow-up assessments, so 28% of child anxiety risk values were missing. A non-significant Little's MCAR test suggests these data may have been missing completely at random ($\chi^2[27] = 33.00$, $p = .197$). T -tests between those with versus without missing data at the initial assessment could not be computed because of only a single observation being missing for each variable. Those with versus without the follow-up assessment did not differ on any demographic variables and did not differ on most primary variables, with the exception that maternal overprotection was higher for participants missing the follow-up assessment ($M = 6.59$, $SD = 2.28$) than participants with the follow up ($M = 5.42$, $SD = 1.89$; $t[88] = 2.39$, $p = .019$; Cohen's $d = 0.56$). Missing data were handled for primary analyses by using Full Information Maximum Likelihood (FIML) to estimate models. FIML uses the entire dataset to make likelihood estimates for missing values, so that the whole dataset can be used in primary analyses. Because SES only acted as a predictor variable, MPlus excluded the case with a missing value in the encouragement of

independent model, resulting in 89 cases for this model and 90 for the model with overprotection.

Path Models

The first model including encouragement of independence (Figure 1) displayed excellent model fit ($\chi^2[1] = 0.18, p = .669$; CFI = 1.00; TLI = 1.00; RMSEA = .00; SRMR = .01). The model explained 6% of the variance in paternal encouragement of independence, 12% of maternal encouragement of independence, and 12% of child anxiety risk. Examining individual paths revealed that no actor effects emerged. In other words, neither parent's anxiety related to their own parenting. One significant partner effect emerged. Above and beyond other relations, paternal anxiety related to lower levels of maternal encouragement of independence. Maternal encouragement of independence related to child anxiety risk. Further, the indirect effect of paternal anxiety on child anxiety risk through maternal encouragement of independence was significant ($ab = 0.012, 95\% \text{ CI } [0.001, 0.043]$).

The second model including protective behavior (Figure 2) was just identified without SES included as a covariate, so indices of model fit were not calculated. The model explained very little of the variance in the mediators (0.2% of paternal overprotection, 2% of maternal overprotection, and 6% of child anxiety risk). No individual paths emerged as significant, and confidence intervals of possible indirect effects all contained zero.

Discussion

The present study investigated maternal and paternal parenting behaviors as mechanisms through which paternal anxiety relates to anxiety risk in children using an APIM framework, while controlling for maternal anxiety. No direct relation between paternal anxiety and child anxiety risk was found. Instead, lower maternal encouragement of independence served as an indirect means through which paternal anxiety related to child anxiety risk, while accounting for maternal anxiety. Surprisingly, the indirect effect of paternal anxiety on child anxiety risk through paternal encouragement of independence was not significant. Additionally, no significant relations emerged in a parallel model incorporating maternal and paternal overprotection as the parenting behaviors of interest. Results provide initial evidence that maternal encouragement of independence, specifically, should be considered when examining the link between paternal anxiety and childhood risk for anxiety in the toddlerhood developmental period.

Maternal restriction of child independence, or lower maternal encouragement of autonomy, emerged as an indirect means through which paternal anxiety relates to anxiety risk in young children. This is consistent with theory from Bögels and Phares (2008) suggesting that paternal anxiety reduces a father's ability to foster autonomous, novelty seeking, and risk-taking behaviors in his child, which subsequently results in changes in maternal parenting behaviors [29]. That is, mothers may react to anxious fathers by displaying more anxiety-relevant parenting behaviors to ameliorate childhood distress and promote well-being. More empirical work is clearly needed to examine this relation and determine the cognitions that paternal anxiety elicits in mothers, which may mediate the relation between paternal anxiety and maternal parenting behaviors.

Results did not suggest that less paternal encouragement of independence indirectly links paternal anxiety and child anxiety risk. Although this was surprising, perhaps this suggests that paternal behaviors are less relevant during toddlerhood and may become more significant for children's anxiety development during the preschool period. In support of this speculation, Majdandžić and colleagues (2014) found that anxiety-relevant paternal parenting behaviors were related to anxiety in 4-year-olds but not 2-year olds [19]. Additionally, previous investigations have provided mixed results regarding the role of paternal parenting on child anxiety, in general [35, 40, 43]. Perhaps the age range of our sample borders a developmental shift when paternal parenting behaviors become more relevant for the development of anxiety. Regardless, results suggest that maternal parenting behaviors that restrict autonomy, specifically in the presence of paternal anxiety, are relevant for anxiety risk in our toddlerhood sample.

The parallel model indirectly linking paternal anxiety and child anxiety risk through maternal and paternal overprotective parenting behaviors did not emerge as significant. Like paternal encouragement of autonomy, it is also possible that overprotection is less relevant for children in toddlerhood. Indeed, a recent meta-analysis by Möller and colleagues (2016) proposed that overcontrol may be more relevant in older samples of children, and may explain why this indirect effect did not emerge [11]. Maternal protective behavior in toddlerhood has been linked to child risk for anxiety [28], but perhaps this is not linked to paternal anxiety. Although paternal and maternal encouragement of independence were negatively correlated with paternal and maternal overprotection, respectively, these correlations were modest. This suggests that fathers are not necessarily engaging in more protection as a result of their anxiety, but that maternal and paternal encouragement of independence are unique constructs that contribute meaningful variance relevant for the development of anxiety in toddlerhood.

Overall, findings are consistent with the APIM framework, which suggests that each member of a dyad influences their own behaviors in addition to their influence on the other partner's behaviors [45–47]. Transactional influences between parents and the spillover effects of paternal anxiety on maternal parenting from within an APIM framework are therefore crucial to consider when examining childhood risk for anxiety development. Paternal anxiety may disrupt a mother's evolutionary tendency to provide care, protection, and support for her child, crossing over to influence her parenting [34]. Further, children who are temperamentally anxious may be particularly at risk for developing anxiety, as these children generally elicit more anxious parenting behaviors from their caregivers [10, 18]. Future research is clearly warranted to clarify the mechanisms by which crossover from paternal anxiety to maternal parenting behaviors may occur, while also accounting for the bidirectional influence of individual child factors.

It is possible that a number of unstudied variables moderate the associations tested in the current study. First, O'Brien and colleagues (2009) found that the strength of marital relationship predicts the degree to which one partner is able to empathetically respond to the needs of the other partner [58]. Though the present investigation did not consider factors that may impact the ability of one partner to cope with the stress of the other, it is likely that such broader family factors influence parenting behaviors [41, 42]. For example, children may be

particularly at risk for developing anxiety when their parents are unable to adequately support and adapt to each other's stress. Secondly, the possible moderating effect of child age on the relation between paternal anxiety and maternal encouragement of independence was not examined. Möller and colleagues (2014) suggested that infancy might be a particularly salient time for the development of certain reference-based avoidance strategies (e.g., referencing parents to understand when to approach or avoid a certain situation) [31], while it may be in preschool when paternal parenting behaviors are particularly relevant [19]. Toddlerhood, on the other hand, is a crucial time for the development of more complex social and emotional competencies within the broader social environment [8]. Paternal anxiety may have a greater influence on child anxiety when children are older, as school-aged children and adolescents reference their fathers more than their mothers when experiencing ambiguous, uncertain situations [29]. These moderations were not investigated in the current study due to sample size and power limitations, but are necessary to consider in future work.

Limitations of the present study should be considered. Paternal and maternal anxiety and parenting behaviors were assessed concurrently from self-report measures. It would certainly have been more comprehensive to consider spousal-report of the other's anxiety and parenting behaviors. It is also possible that the self-report measures of parenting and anxiety utilized in this investigation did not provide the most robust indication of the examined constructs or their relation. Our measure of anxiety in parents focused primarily on physiological symptoms of anxiety, and therefore may not have comprehensively captured trait levels of anxiety. Future studies utilizing independent ratings of maternal and paternal anxiety may find even stronger relations among the variables investigated in this study. Further, although child anxiety risk was measured longitudinally, because the measure of child anxiety risk was derived from one time point, it was not possible to examine how parenting behaviors predicted change in child anxiety risk. Future investigations should examine paternal anxiety and maternal and paternal parenting behaviors over time to better identify causal influences on child anxiety. The attachment relationship is another component to consider when capturing the child's early caregiving environment. Attachment is foundational in the development of several child characteristics including future independence/dependence, which has clear implications for anxiety risk [59]. Future work should simultaneously consider our effects in light of the child's attachment to their mother and father to more comprehensively understand the emergence of anxiety risk from broader family dynamics. Similarly, although we approached this investigation with the assumption that mothers serve as the primary caregiver, our results and the guiding theory for this work may not adequately capture more diverse family roles. Future work should empirically assess the role of each caregiver to better understand these relations. Finally, our sample was small and was comprised of primarily, European American families with heterosexual, married parents; it is unclear if results would generalize to other ethnic groups or to more diverse family compositions. A more comprehensive and larger scale evaluation of the various influences of parents on each other's parenting behaviors will allow researchers and clinicians to gain a more thorough understanding of anxiety development in children.

Summary

The present study contributes to the existing literature by demonstrating that fathers play important and indirect roles in the development of anxiety risk in toddlers. Although it is understood that both mothers and fathers play important and unique roles in the development of children's social and emotional development, paternal influence on child anxiety development has historically received less examination. Extant theory and evidence suggests that paternal anxiety may impact their own parenting behaviors as well as the mother-child relationship by influencing the frequency of anxiety-relevant maternal parenting behaviors, including overprotection and encouragement of independence [29, 34]. These parenting behaviors are particularly important to consider in children at risk for anxiety, such as children with higher degrees of inhibited temperament [22]. Both fathers and mothers of 12- to 30-month-olds provided self-report of their anxiety and parenting behaviors. Inhibited temperament (i.e., anxiety risk) was measured one year later through a standardized observational paradigm used to assess typical reactions to novel people and objects. Two path analyses using an APIM were examined separately for encouragement of independence and overprotection. These models revealed no direct relation between parent anxiety and child anxiety while controlling for parenting behaviors. Models did suggest that paternal anxiety is indirectly linked with child anxiety through lower maternal encouragement of independence, but not through maternal overprotection or paternal parenting behaviors. These results offer insight into the importance of considering broader family functioning when examining the development of anxiety in children. This yields crucial information regarding the emergence of early anxiety risk and points to areas for intervention to reduce the costly consequences associated with this mental disorder.

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Figure 1.

Path model of relations among paternal and maternal anxiety and encouraging independence, and child anxiety risk. Unstandardized coefficients are reported with standard errors in parentheses. Socioeconomic status (SES) was also included as a predictor of paternal encouragement of independence ($b = 0.99$, $SE = 0.44$, $p = .023$) and maternal encouragement of independence ($b = 1.09$, $SE = 0.41$, $p = .008$). Model fit indices are noted in text. Enc Ind = Encouragement of Independence.

$^{\dagger}p .10$, $^{*}p .05$, $^{**}p .01$.

Figure 2.

Path model of relations among paternal and maternal anxiety and overprotection, and child anxiety risk. Unstandardized coefficients are reported with standard errors in parentheses.

Table 1

Descriptive Statistics

Variable	Mean	SD	Range
Paternal Anxiety	2.38	3.10	0.00 – 12.00
Maternal Anxiety	2.07	2.91	0.00 – 12.00
Paternal Encouragement of Independence	31.51	3.72	22.17 – 40.00
Maternal Encouragement of Independence	32.24	3.55	24.00 – 40.00
Paternal Overprotection	6.28	2.30	3.00 – 14.00
Maternal Overprotection	5.71	2.04	3.00 – 11.00
Child Anxiety Risk ^a	−0.06	0.77	−1.20 – 2.58

Note. Descriptive statistics were calculated after the removal of multivariate outliers.

^a Child anxiety risk represented the averaged of standardized scores (*Z*-scores).

Table 2

Correlations among Primary Variables

	2	3	4	5	6	7	8
1. Paternal anxiety	.13	-.11	-.21 [*]	.04	.04	.18	-.10
2. Maternal anxiety	--	-.01	-.10	.03	.15	.13	-.20
3. Paternal encouragement of independence		--	.36 ^{***}	-.37 ^{***}	-.13	-.05	.23 [*]
4. Maternal encouragement of independence			--	-.18	-.33 ^{**}	-.27 [*]	.29 ^{**}
5. Paternal overprotection				--	.08	.03	-.04
6. Maternal overprotection					--	.09	-.11
7. Child anxiety						--	-.04
8. Socioeconomic status							--

Note. Bivariate correlations were computed after removal of multivariate outliers.

^{*} $p < .05$,

^{**} $p < .01$,

^{***} $p < .001$