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### Coparenting and child anxiety

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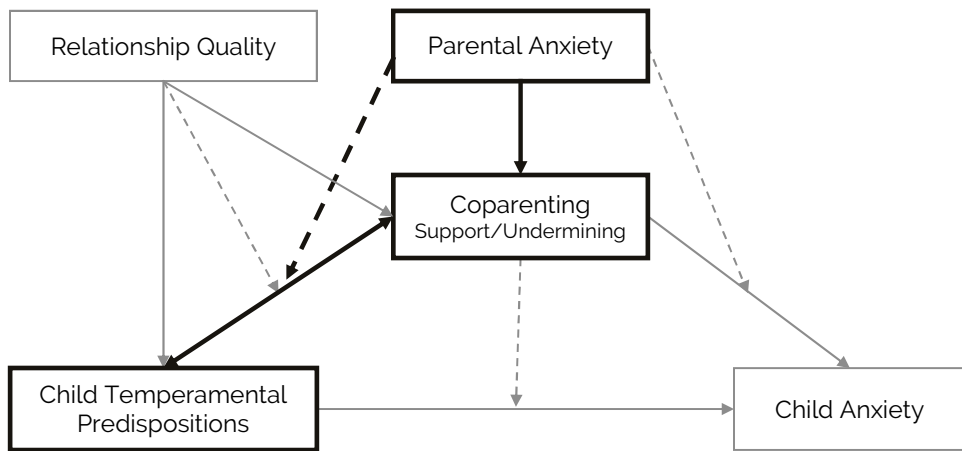
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Graphical representation of the associations tested in this thesis (adjustment of the model by Majdandžić et al., 2012). Dashed lines represent moderation effects. Lines in black are the effects that are tested in Chapter 2. Lines in grey are tested in other chapters.

# CHAPTER

# 2

## **Concurrent and Predictive Associations Between Infants' and Toddlers' Fearful Temperament, Coparenting, and Parental Anxiety Disorders**

This chapter is based on:  
Metz, M, Majdandžić, M., & Bögels, S. M. (2016). Concurrent  
and Predictive Associations Between Infants' and Toddlers'  
Fearful Temperament, Coparenting, and Parental Anxiety  
Disorders. *Journal of Clinical Child and Adolescent  
Psychology*, 1-12.

## ABSTRACT

### Objective

This study investigated the bidirectional relations between two dimensions of coparenting (the way parental figures cooperate in parenting), undermining and support, and child fearful temperament longitudinally from infancy to toddlerhood, while inspecting the moderating role of parents' anxiety disorders.

### Method

Questionnaire data on coparenting and child fearful temperament were obtained from 135 mothers, fathers and their firstborns at 4 months, 12 months, and 30 months. Parental anxiety disorder severity was assessed with a semi-structured interview before the birth of the child.

### Results

Multilevel analysis revealed that, across measurement moments, undermining coparenting, but not supportive coparenting, was concurrently related to higher child fearful temperament. Parental anxiety disorder severity was related to more undermining coparenting, but not to supportive coparenting. No moderation effects for parental anxiety disorder or for parent gender were found in the relations between coparenting and child fearful temperament.

### Conclusions

We conclude that more parental anxiety is related to a lower quality of the coparenting relationship, which in turn is associated to more child fearful temperament. More specifically, it appears that undermining coparenting, and not supportive coparenting, is related to child fearful temperament and parental anxiety disorder severity. Our results suggest that undermining coparenting, by both father and mother, is one of the mechanisms that may contribute to the intergenerational transmission of anxiety from parent to child. The coparenting relationship may be a useful target in the prevention and treatment of child anxiety.

## INTRODUCTION

In developmental psychology, families are defined as interdependent systems (Minuchin, 1985), implying that the study of development should focus on the family system rather than on the dyadic relations within this system (mother – child, father – child, mother – father). Given that anxiety disorders are by far the most prevalent mental disorders, with an estimated one-year prevalence of 14% (Hettema, Neale, & Kendler, 2001; Wittchen et al., 2011), and generally have their onset in childhood (American Psychiatric Association, 2013; Beesdo-Baum & Knappe, 2012), it is surprising that research on the development of childhood anxiety generally lacks a family systems perspective (Majdandžić, de Vente, Feinberg, Aktar, & Bögels, 2012). Based on Feinberg's (2003) ecological model of coparenting, Majdandžić et al. (2012) proposed the construct of coparenting as a way to introduce a systemic approach to the study of anxiety.

Generally, coparenting is defined as “the ways that parents and/or parental figures relate to each other in the role of parent” (Feinberg, 2003, p. 96), thus entailing the triadic mother-father-child system. Coparenting is usually described in terms of supportive and undermining coparenting. Supportive coparenting refers to the “affirmation of the other's competency as a parent, acknowledging and respecting the other's contributions, and upholding the other's parenting decisions and authority” (Feinberg, 2003, p. 104). Undermining coparenting refers to parental undermining of the other parent through criticism, disparagement, and blame (Belsky, Woodworth, & Crnic, 1996; McHale, 1995; Feinberg, 2003).

In their model, Majdandžić et al. (2012) propose several bidirectional associations between coparenting and child anxiety. The authors suggest that anxiety in the child may lead to more coparental conflict (i.e., undermining). In turn, undermining coparenting creates an emotionally unsafe environment which could lead to more anxiety in the child. Similarly, a supportive coparenting environment can serve as a protective factor against child anxiety. These dynamics can result in a vicious cycle where more child anxiety relates to more undermining and less support, which is again related to more anxiety in the child. Thus, coparenting and child anxiety are thought to bidirectionally influence each other.

Research shows that a fearful temperament in infants and young children is a risk factor for the development of anxiety in later childhood (Fox, Henderson, Marshall, Nichols & Ghera, 2005). Children with a fearful temperament tend to show inhibition, fear and distress in response to new objects, situations, and people. To unravel the development of childhood anxiety, it is relevant to explore the development of its precursors, such as a fearful temperament (Hudson, Dodd & Bovopoulos, 2011; Dougherty et al., 2013). The relations between coparenting and child fearful temperament specifically have not yet been studied, therefore, we here discuss studies including the broader concepts of child negative affect, as well as difficult temperament (i.e., irritable, distress-prone and unadaptable) and similar constructs. Negative affect and difficult temperament have been identified as risk factors for later anxiety (Fox et al., 2005).

In infancy, concurrent relations between coparenting and child temperament have been found for both supportive and undermining coparenting. Gordon and Feldman (2008) found negative relations between fathers' coparenting mutuality (a parent's active support of the partner's interactive efforts with the child) and parent reports of difficult temperament at 5 months. Others have found negative trends between observed supportive coparenting in the family triad and unadaptability and fussiness at 3.5 months (Schoppe-Sullivan, Mangelsdorf, Brown, & Sokolowski, 2007). Using self-reports of perceived support from the other parent, Van Egeren (2004) found that fathers reported better coparenting experiences when infants were perceived to have an easier temperament in 1- to 6-month-olds. Also, more observed paternal intrusiveness (which is part of undermining coparenting) has been related to more difficult temperament in 13-month-olds (Lindsey, Caldera, & Colwell, 2005). Thus, correlational studies provide evidence for a negative relation between difficult temperamental child characteristics and the quality of the coparenting relationship. In addition, the results from concurrent studies indicate that it is especially fathers' coparenting that is related to child difficult temperament, in such a way that fathers' supportive coparenting and coparenting mutuality are related to lower levels of difficult child temperament (Gordon & Feldman, 2005; Van Egeren, 2004) and that fathers' intrusive coparenting is related to more difficult child temperament (Lindsey, Caldera, & Colwell, 2005).

In addition to concurrent research, longitudinal studies have also established relations between difficult child temperament and coparenting. Using observations of the whole family, predictive relations from difficult child temperament to less subsequent supportive coparenting were found from 3.5 months to 13 months (Davis, Schoppe-Sullivan, Mangelsdorf, & Brown, 2009) and from 13 months to 3 years (Laxman et al., 2013). Davis et al. (2009) found these effects also in the reversed direction, such that more supportive coparenting at 3.5 months predicted less difficult child temperament at 13 months. Whereas Davis et al. (2009) found no longitudinal associations between child difficult temperament and undermining in the triad, Laxman et al. (2013) did find longitudinal associations from more difficult child temperament at 13 months to more undermining at 30 months. Interestingly, an interaction was found where more difficult child temperament at 13 months only related to more undermining at 30 months when fathers had a high score on negative emotionality. Using self-report data, Solmeyer and Feinberg (2011) found no relations between fathers' and mothers' ratings of child difficult temperament at 4–8 months and their self-reported supportive or undermining coparenting towards their partner at 13 months.

In conclusion, concurrent research between coparenting and child temperament shows that supportive as well as undermining coparenting are related to child difficult temperament. Some differences between mothers and fathers were found, but results are not replicated in all studies and the direction of these differences is unclear. In longitudinal research, significant relations have been found between supportive as well as undermining coparenting and child

difficult temperament. In longitudinal studies, father-mother differences were only assessed by Solmeyer and Feinberg (2011) and these authors did not find differences between fathers and mothers in the relations between child temperament and coparenting.

A relevant approach to the associations that have been found between child fearful temperament and coparenting quality is the model by Crockenberg and Leerkes (2003). This model proposes that for unprepared parents (e.g., parents with low income or psychopathology), child negative affectivity is related to poor family outcomes (such as low quality of the marital relations or the coparenting relationship); however, if families are well-prepared for their roles as parents, a child with negative affectivity can draw families together, resulting in positive family outcomes. The model suggests that parental psychopathology moderates the relationship between child negative temperamental characteristics and coparenting outcomes. Given our focus on child fearful temperament as a precursor of child anxiety and the fact that anxiety aggregates in families (Hettema, Neale, & Kendler, 2001), we here focus on the moderating role of parental anxiety in the relations between coparenting and child fearful temperament. In their review, Majdandžić et al. (2012) also propose that couples in which a member has an anxiety disorder might show different coparenting interactions than couples without an anxious parent. That is, parental anxiety disorders can interfere with positive coparenting due to concerns and overprotective behavior of the anxious parent, which may lead to heightened conflict. However, it can also be that parents with an anxiety disorder are more supportive of their partner's parenting due to their own insecurity (Majdandžić et al., 2012).

In line with the models of Crockenberg and Leerkes (2003) and Majdandžić et al. (2012), previous studies found relationships between lower coparenting quality and the presence of parental negativity (Belsky, Crnic, & Gable, 1995) as well as depression (Isacco, Garfield & Rogers, 2010). The only study examining a construct that is related to anxiety was done by Laxman et al. (2013). These authors found that fathers' negative emotionality (a construct involving the experiences of fear, anger, and anxiety; Krueger, Caspi, Moffitt, Silva, & McGee, 1996) was related to higher scores on observed undermining coparenting in the triad, but only when parents rated their child as having a difficult temperament. Interestingly, mothers' higher levels of negative emotionality were related to lower levels of observed undermining.

In the current study, the coparenting construct was investigated in relation to child fearful temperament from infancy to toddlerhood. By focusing on the developmental period from infancy to toddlerhood, we extend the current knowledge by bridging the developmental period from early infancy to toddlerhood. To our knowledge, no study has thus far specifically looked into the relations with child fearful temperament. Given the hypothesized role of parental anxiety disorders in the relations between child fearful temperament and coparenting (Crockenberg & Leerkes, 2003; Majdandžić et al., 2012; Laxman et al., 2013), we investigate both the relation between parental anxiety disorders and coparenting behaviors, and the moderating role of parental anxiety disorders in the

relations between child fearful temperament and coparenting behaviors. Finally, because previous research suggests differences between fathers and mothers in the relations between child fearful temperament and coparenting (Gordon & Feldman, 2008; Lindsey, Caldera & Colwell, 2005; Van Egeren, 2004), we investigated the role of parent gender in the relations between child fearful temperament and coparenting.

We used a longitudinal design, analyzing questionnaire data of fathers and mothers on coparenting and child temperament when the child was 4 months, 12 months, and 30 months old. The longitudinal design of our study enabled us to look at both the concurrent relations between coparenting behaviors and child fearful temperament and the predictive relationships between these behaviors over time. In this way, we aimed to shed more light on the direction of effects in the relations between coparenting and child temperament.

The goals of the study were to investigate (a) whether concurrent (i.e., correlational) as well as predictive (i.e., longitudinal) relations exist from coparenting to child fearful temperament and vice versa; (b) whether parents' own anxiety disorders are related to coparenting; (c) whether parents' anxiety disorders moderated the relationship between child fearful temperament and coparenting; and (d) whether the relations between coparenting and child fearful temperament differed for mothers and fathers. We expected to find (a) concurrent as well as predictive relations from coparenting to child fearful temperament and vice versa, with more supportive coparenting being related to less concurrent and subsequent child fearful temperament; more undermining coparenting being related to more concurrent and subsequent fear in the child; and more child fearful temperament being related to less concurrent and subsequent supportive coparenting and more concurrent and subsequent undermining coparenting. Also, we expected that (b) parental anxiety is related to coparenting behaviors, with parents high on anxiety disorders showing more undermining and less supportive coparenting than less anxious parents, and (c) parental anxiety moderates the relationships between child temperament and coparenting, in such a way that less anxious parents might become closer and more mutually supportive when the child has a fearful temperament, whereas highly anxious parents are negatively influenced by child fearful temperament and thus show more undermining when the child has a fearful temperament. Lastly, we expected to find that (d) fathers' coparenting behaviors show stronger relations with child fearful temperament than mothers' coparenting behaviors.

## **METHOD**

### **Participants**

Couples expecting their first child were recruited through advertisements in magazines and flyers distributed by midwives. The Department of Psychology's ethical approval was obtained and written informed consent was obtained from all participants. Families were excluded if the child's birth weight was under 2500 g, if the infant had neurological



disorders, or an APGAR score below 8. Families received a gift voucher after finishing every measurement. At Time 1, when the child was 4 months old ( $M$  age of child = 4.2,  $SD$  = 0.33), 135 fathers and mothers and their firstborns participated (75 (55.6%) girls). At Time 2, when the child was 12 months old ( $M$  = 12.4,  $SD$  = .72), 131 fathers (3% missing) and 130 mothers (4% missing) took part ( $M$  = 12.4,  $SD$  = .72) and at the last measurement (Time 3), when the child was 30 months old ( $M$  = 30.1,  $SD$  = .53), 121 fathers (11% missing) and 120 mothers (11% missing) participated. Attrition was mainly due to couples indicating that they did not have enough time to participate.

At the prenatal measurement, father's age was 34.5 years ( $SD$  = 5.4) and the average educational level of fathers was 6.6 ( $SD$  = 1.6) on an 8-point scale from 1 (*primary education*) to 8 (*university*). Mothers' average age was 31.5 ( $SD$  = 4.2) and mothers had an educational level of 7.1 ( $SD$  = 1.14). At the prenatal measurement, the average relationship duration was 6.4 years ( $SD$  = 3.7) and 97.8% of parents were married or living together; 2.2% indicated an "other" marital state. At 12 months, one couple was divorced, and at 30 months another couple was divorced. Analyses were completed with and without divorced couples. Because results stayed the same, these couples were not removed from the analyses.

## Procedure

Before their child was born, parents separately visited the University research center to complete a clinical interview assessing anxiety disorders. When their child was 4 months, 12 months, and 30 months old, both parents separately visited the research center with his/her child for observational measurements (not part of the current study). At each of the three measurement occasions, parents completed several questionnaires about their infant and about themselves. Due to the length of the questionnaire booklets, the questionnaires were given to the parents in two separate booklets. We divided the set of questionnaires into one booklet about the child and one about the parent. Before the visit of the first parent, parents received the first questionnaire booklet at home by mail. When the first parent visited the lab, parents were asked to bring the filled out questionnaires with them. After parents returned the first questionnaire booklet, the second questionnaire booklet was given to them, to complete in their own homes. Parents returned the second questionnaire booklet when the second parent visited the lab, or by mail. In the current study, only questionnaires about coparenting and child temperament were used.

## Measures

### *Parental anxiety disorder severity*

At the prenatal measurement, parents were interviewed through the Anxiety Disorder Interview Schedule (ADIS; Di Nardo, Brown, & Barlow, 1994), a semi-structured clinical interview based on the DSM-IV criteria for anxiety disorders. Four trained and experienced interviewers assessed fathers' and mothers' current and past anxiety disorder

status. A trained psychologist recoded 10% of the data to establish interobserver reliability. Interobserver agreement for all ADIS diagnoses, based on absence or presence of the specific disorder, was 97.55% (range 90%-100%,  $SD = 2.95$ ). In the interview, for every disorder, severity of the diagnosis is reflected in a severity score. All parents received a severity score ranging from 1 – 8 for every indicated anxiety problem, according to ADIS guidelines. Following Simon, Bögels and Voncken (2011), in order to create a continuous score of anxiety disorder severity, severity scores were summed for all current and past anxiety disorders at the time of the interview (including panic disorder, agoraphobia, social anxiety disorder, generalized anxiety disorder, post-traumatic stress disorder, and obsessive compulsive disorder, following DSM-IV criteria). This resulted in a continuous anxiety disorder severity measure, reflecting both the number of the diagnosed lifetime anxiety disorders and their impact on participants' lives.

### ***Child fearful temperament***

At all measurements, both parents reported on their child's temperament. At 4 months and 12 months, parents completed the Revised Infant Behavior Questionnaire (IBQ-R; Gartstein & Rothbart, 2003). The IBQ-R assesses infant temperament from 3 months to 12 months and consists of 14 scales with 191 items which are rated on a 7-point Likert scale from *never* to *always*. Parents are asked how often, during the past seven days, their child displayed specific behaviors. In the current study only the fearful temperament scale was used. This scale consists of 16 items, which measure general fear (e.g., "How often during the last week did the baby startle to a loud or sudden noise?") and social fear (e.g., "When introduced to an unfamiliar adult, how often did the baby cling to a parent?").

At 30 months, both parents filled out the short form of the Early Childhood Behavior Questionnaire (ECBQ; Putnam, Gartstein, & Rothbart, 2006). In the ECBQ, parents are asked how often their child displayed specific behaviors in the last two weeks. The questionnaire consists of 18 scales and 107 items; items were rated on a 7-point Likert scale from *never* to *always*. To ensure similarity between the IBQ measurement of a fearful temperament (which includes both social and non-social measures of fearful temperament) and the ECBQ measure of a fearful temperament, we combined the ECBQ scales of fearfulness (8 items about non-social fears, e.g. "While at home, how often did your child seem afraid of the dark?") and shyness (5 items about social fears, e.g. "When approaching unfamiliar children playing, how often did your child seem uncomfortable?") into one scale ( $r_{\text{mothers}} = .27, p < .01$ ;  $r_{\text{fathers}} = .22, p < .05$ ).

Cronbach's  $\alpha$  for the measures of fearful temperament at 4 months, 12 months and 30 months for mothers were respectively: .77, .88, and .68. For fathers, Cronbach's  $\alpha$  was .78 at 4 months, .89 at 12 months, and .70 at 30 months.

### **Coparenting relationship quality**

The quality of the coparenting relationship was assessed through the Dutch version of the revised Coparenting Scale (CPS; Karreman, van Tuijl, van Aken & Dekovic, 2008; McHale, 1997; 1999; McHale, Kuerston-Hogan, Lauretti & Rasmussen, 2000). This questionnaire measures the way in which parents rate their own coparenting behaviors towards their partner. The revised CPS consists of 18 items which are answered on a Likert scale from 1 to 7 (*absolutely never to almost constantly / at least once an hour*). Due to a mistake in administering the questionnaire, one item was omitted (“How often in a typical week are you the first one to step in and handle things when your child is acting up or disobeying the rules?”).

In McHale’s (1997) original study on the CPS, four constructs emerged from factor analysis: family integrity, disparagement, conflict, and reprimand. In line with Karreman et al.’s (2008) results, only the Family Integrity and Conflict scales proved reliable in our sample (alpha’s ranging from .74 to .83), whereas the scales Disparagement and Reprimand were unreliable (alpha’s ranging from .16 to .54). To ensure reliable measurement of constructs and in order not to lose data, we performed a principal-component analysis with Varimax rotation to extract a new factor structure from the data. We found a reliable and stable two-factor solution for both fathers and mothers on all measurement occasions; see Table 1 for average factor loadings of fathers and mothers over time. Following the guidelines provided by Stevens (2009) for a reliable interpretation of factor loadings given sample size, only items with factor loadings larger than .512 were kept in. This procedure resulted in the removal of two items (How often in a typical week “...do you say to your partner ‘You need to handle this’ when your child is acting up”, “...do you stand by and watch quietly as your partner steps in to correct your child”). One item in the questionnaire on physical affection towards the child (“How often in a typical week (when all 3 of you are together) do you show physical affection to your child?”) yielded a satisfactory factor loading for fathers (.62) but not for mothers (.49). Based on these factor loadings and the lack of relation to the coparenting construct as we defined it, we decided to remove this item. This resulted in 14 items, which are evenly distributed across two factors which we from now on refer to as “supportive coparenting” (7 items) and “undermining coparenting” (7 items). Across the three measurements of fathers and mothers, this two-factor solution explained an average 46% (range: 42–49%) of the variance in the scores.

**Table 1** Averaged factor loadings of the items in the Coparenting Scale per parent per factor, averaged across the three measurement occasions. SD of the factor loadings is in brackets.

Item description	Mother		Father	
	Factor 1 (SD)	Factor 2 (SD)	Factor 1 (SD)	Factor 2 (SD)
Physical affection to child	0.488 (.02)	-0.118 (.21)	<b>0.624</b> (.06)	-0.025 (.08)
Physical affection to partner	<b>0.654</b> (.04)	-0.127 (.11)	<b>0.703</b> (.07)	-0.103 (.06)
Affirming the child to partner	<b>0.645</b> (.07)	-0.005 (.08)	<b>0.681</b> (.15)	-0.127 (.14)
Affirming the partner to child	<b>0.779</b> (.04)	-0.026 (.03)	<b>0.779</b> (.07)	-0.097 (.08)
Inviting partner to join in	<b>0.696</b> (.04)	0.031 (.01)	<b>0.721</b> (.09)	0.061 (.09)
Asking partner to discipline	0.133 (.21)	0.380 (.12)	0.298 (.02)	0.433 (.02)
Taking back seat in discipline	0.195 (.03)	0.105 (.15)	0.239 (.05)	0.343 (.19)
Intervening partner's discipline	-0.021 (.03)	<b>0.576</b> (.09)	-0.098 (.02)	<b>0.550</b> (.06)
Tense interchange with partner about child	0.009 (.05)	<b>0.643</b> (.08)	-0.002 (.13)	<b>0.742</b> (.02)
Tense interchange with partner about other	-0.065 (.10)	<b>0.696</b> (.10)	-0.085 (.06)	<b>0.703</b> (.03)
Arguing with partner about child	-0.041 (.11)	<b>0.784</b> (.03)	-0.026 (.07)	<b>0.743</b> (.06)
Arguing with partner about other	-0.077 (.20)	<b>0.649</b> (.06)	-0.162 (.01)	<b>0.634</b> (.07)
Invoking the family unit	<b>0.710</b> (.02)	0.033 (.12)	<b>0.723</b> (.01)	0.083 (.12)
Invoking the absent parent	<b>0.780</b> (.04)	0.148 (.06)	<b>0.795</b> (.02)	0.122 (.10)
Positively mentioning the absent parent	<b>0.791</b> (.02)	0.079 (.09)	<b>0.802</b> (.02)	0.049 (.06)
Cause neg. feeling-absent parent	0.207 (.04)	<b>0.581</b> (.08)	0.191 (.07)	<b>0.550</b> (.12)
Criticizing absent parent	0.022 (.03)	<b>0.645</b> (.11)	0.036 (.13)	<b>0.595</b> (.12)

Note: Factor 1 = supportive coparenting; Factor 2 = undermining coparenting

Scale scores were computed by averaging the corresponding item scores. The scale of support consisted of items such as “How often in a typical week (when all 3 of you are together) do you make an affirming or complimentary remark about your partner to your child?”. Thus, support refers to the extent to which a parent reported to give support to their partner. Cronbach’s  $\alpha$  for the support scale ranged from .84 to .85 for mothers across measurement occasions, and from .86 to .90 for fathers. An example of the scale of undermining is “How often in a typical week when you are alone with your child do you find yourself saying something clearly negative or disparaging about your partner to your child?”. Thus, undermining refers to the extent to which a parent reported to undermine their partner. For undermining, Cronbach’s  $\alpha$  ranged from .75 to .78 for mothers and from .74 to .78 for fathers across measurement occasions.

### Statistical Analyses

To account for the hierarchical nature of our data, we used multilevel analysis with a two-level structure, consisting of measurement occasions nested within families. The significance of effects was evaluated at  $\alpha = .05$ . Because child fearful temperament was measured using two different questionnaires, we chose to standardize child fearful temperament into  $z$  scores at all measurement occasions. For reasons of comparability and comprehension, we also standardized support and undermining. Thus, all key study variables that were measured repeatedly, were standardized.

All multilevel models included a random intercept. Parent and Time were entered as dummy variables, with mother and Time 1 as reference categories. All other predictors were continuous. Models were analyzed using MLwiN version 2.24. Assumptions of multivariate normality and linearity were checked for all variables and were satisfactory.

Given our goal to investigate the bidirectional effects between coparenting and child fearful temperament, three different models were analyzed: a model in which coparenting (i.e., support and undermining) predicted child fearful temperament, a model in which child fearful temperament predicted supportive coparenting, and a model in which child fearful temperament predicted undermining coparenting. First, we fitted one concurrent model in which concurrent (i.e., simultaneous) relations between coparenting and child fearful temperament were addressed by entering predictors and outcome variables measured at the same moment in time. Next, we fitted three predictive models. In the predictive models, sequential effects were addressed by analyzing the effects of the predictors at  $t$  on the outcome variable at  $t+1$ . For example, undermining at Time 1 was used to predict child fearful temperament at Time 2. To correct for the stability of constructs over time in the predictive models, previous measurements of the outcome variable were also included as predictors; for example, when predicting child fearful temperament at  $t+1$ , child fearful temperament at  $t$  was also included as a predictor. Effects can therefore be interpreted as a change in the dependent variable. To control for concurrent effects in the predictive models,

we added the predictors not only at  $t$ , but also at  $t+1$ . Thus, in the model where support at  $t$  predicts child fearful temperament at  $t+1$ , the concurrent relations between support at  $t+1$  and child fearful temperament at  $t+1$  were also added.

In all models, Time was entered as a control variable. Next, parent (mother, father), parental anxiety disorder, and (depending on the model) child fearful temperament or support and undermining were included as predictors. In multilevel modelling, the dependent variable is entered at the lowest level. In our data, this is the level of measurement occasions for each parent separately. All data that were measured repeatedly for both father and mother are added into the models at this lowest level (i.e., fearful temperament, support, and undermining). This also means that for the association between child fearful temperament and supportive coparenting, fathers' reports of child fearful temperament are correlated to fathers' reports of supportive coparenting, and mothers' reports of child fearful temperament are correlated to mothers' reports of supportive coparenting. Through statistical interactions, differences in effects between fathers and mothers can be investigated.

Interaction terms with parental anxiety disorder and parent gender were added to the models to investigate the influences of parental anxiety disorder and parent gender on the relations between coparenting and child fearful temperament. Interaction terms were kept in or removed based on their explanatory value; only terms with a significant  $\beta$  were kept in the model ( $\alpha = .05$ ). When significant, interaction effects were plotted and simple slopes were tested to interpret the results, as described in Preacher, Curran, and Bauer (2006).

## RESULTS

### Descriptive Statistics

Descriptive statistics and correlations for all key study variables are shown in Table 2. Of the 132 couples, 72 mothers (55 %) and 51 fathers (39 %) had one or more lifetime anxiety disorders before the birth of the child.

### Multilevel Models

As described above, we tested a series of models assessing bidirectional relations between child fearful temperament, undermining coparenting and supportive coparenting. First, we present two models with child fearful temperament as the outcome: Model 1 concerns the concurrent relationships between child fearful temperament and coparenting; Model 2 concerns the predictive relationships in which child fearful temperament is predicted by coparenting. Second, the predictive model in which support is predicted by child fearful temperament is presented and third, the predictive model in which undermining is predicted by child fearful temperament is presented.

**Table 2** Means, SD's, and correlations of parental anxiety, child fearful temperament, undermining, and support for both mothers and fathers at Time 1, Time 2, and Time 3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1. mothers' anxiety																					
2. child fear M_T1	.05																				
3. child fear M_T2	.02	.26**																			
4. child fear M_T3	.09	.21*	.13																		
5. support M_T1	-.06	.04	.03	-.15																	
6. support M_T2	-.15	-.07	-.03	-.21*	.68***																
7. support M_T3	-.13	.08	.13	-.01	.54***	.50***															
8. undermining M_T1	.18	.11	.14	.02	.07	-.05	-.03														
9. undermining M_T2	.23*	.00	.13	.00	.07	.12	-.01	.62***													
10. undermining M_T3	.21*	-.12	.13	.07	.12	.11	.02	.51***	.65***												
11. fathers' anxiety	.29***	-.19*	-.14	-.14	-.12	-.12	.03	-.15	.07	.03	.00										
12. child fear F_T1	.07	.49***	.27**	.27**	-.09	-.07	-.10	.17	.23*	.21*	.09										
13. child fear F_T2	.09	.09	.55***	-.01	-.03	-.10	.04	.01	.03	.03	.02	.36***									
14. child fear F_T3	.01	.13	.29**	.44***	-.15	-.08	.09	.07	.18	.01	.04	.34***	.47***								
15. support F_T1	-.25**	.12	.19*	.07	.20*	.17	.34***	.01	.10	.14	-.24*	.16	.13	.11							
16. support F_T2	-.21*	.05	.18	-.01	.20*	.28**	.30**	-.05	.11	.15	-.13	.00	.06	.06	.71***						
17. support F_T3	-.30**	.03	.06	.06	.11	.18	.32***	-.11	.13	.03	-.12	-.02	.00	-.02	.63***	.69***					
18. undermining F_T1	.12	.04	.06	-.06	-.04	.07	.10	.25**	.28**	.20*	.10	.19	.11	.14	-.04	-.10	-.08				
19. undermining F_T2	.19*	-.05	.15	-.08	.00	.11	.02	.34***	.43***	.30**	.26**	.21*	.18	.20*	.02	-.04	-.10	.58***			
20. undermining F_T3	.25**	.01	.26**	-.05	.04	.13	.04	.37***	.44***	.47***	.31**	.26**	.28**	.19*	-.05	.04	.01	.57***	.69***		
Mean	6.10	1.86	2.47	2.86	5.20	5.30	5.27	2.25	2.34	2.57	3.96	1.96	2.45	2.82	4.94	4.98	5.13	2.02	2.27	2.47	
SD	7.12	0.67	0.80	0.74	0.87	0.83	0.70	0.71	0.71	0.67	5.35	0.61	0.76	0.84	0.91	0.87	0.84	0.65	0.69	0.68	
N	132	117	117	114	117	115	114	114	115	114	132	112	112	111	113	114	110	114	114	114	110

Note: M, mother; F, father; T1, Time 1 at 4 months; T2, Time 2 at 12 months; T3, Time 3 at 30 months. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001

### **Child fearful temperament**

Table 3 shows the concurrent model (Model 1) and predictive model (Model 2) for the prediction of child fearful temperament. We found no significant associations between child fearful temperament and supportive coparenting, either concurrently or predictively. We did find that more undermining was related to more concurrent child fearful temperament. No predictive relationship was found from earlier undermining coparenting to later child fearful temperament. Parental anxiety disorder severity was unrelated to child fearful temperament and did also not moderate the relationship between coparenting and child fearful temperament. In addition, interactions with parent gender were not significant, indicating that there were no differences between fathers and mothers in the associations between coparenting and child fearful temperament.

**Table 3** Parameter Estimates for the Concurrent and Predictive Multilevel Models of Child Fearful Temperament Regressed on Control Variables and Parent Variables.

	Model 1: concurrent relationships			Model 2: predictive relationships		
	$\beta$	SE	$p$	$\beta$	SE	$p$
Intercept	.03	.08	.708	-.15	.20	.453
Measurement 2	.01	.08	.901	.04	.09	.657
Measurement 3	.00	.08	1.000			
Parent	-.02	.07	.775	.05	.09	.579
Parental anxiety	.07	.05	.162	.03	.06	.617
Support_ $t$	.03	.04	.453	.01	.06	.868
Undermining_ $t$	.13**	.04	.001	.03	.07	.738
Child fear_ $t$				.12*	.05	.016
Support_ $t+1$				-.04	.06	.505
Undermining_ $t+1$				.12*	.06	.046

Note: Model 1 tests the concurrent associations between predictors at  $t$  and child fearful temperament at  $t$ . Model 2 tests the predictive associations between predictors at  $t$  and child fearful temperament at  $t+1$  (see Methods). All continuous predictor and outcome variables were transformed into z-scores.

\* $p < .05$ , \*\* $p < .01$

### **Supportive coparenting**

Table 4 shows the predictive model for supportive coparenting. We did not find a predictive relationship between child fearful temperament and support. Parents' lifetime anxiety disorder severity was unrelated to supportive coparenting. Also, parents' lifetime anxiety disorder severity did not moderate the association between child fearful temperament and supportive coparenting and no differences between fathers and mothers were found. The only significant predictor of supportive coparenting was previously measured supportive coparenting.



### Undermining coparenting

Table 4 shows the predictive model for undermining coparenting. We found no predictive relationship from previous child fearful temperament to later undermining coparenting. We did find a concurrent association between child fearful temperament and undermining, replicating the concurrent model presented above. In addition, parental lifetime anxiety disorder severity was positively related to undermining coparenting. Thus, parents higher on anxiety severity before the birth of the child show higher undermining coparenting when children are 4 months to 30 months old. With regard to parent gender, we did not find significant interactions, indicating that the associations between undermining coparenting and child fearful temperament do not significantly differ for fathers and mothers<sup>1</sup>.

**Table 4** Parameter Estimates for the Predictive Multilevel Model of Supportive Coparenting and Undermining coparenting Regressed on Control Variables, Parental Anxiety, and Child fearful temperament.

	Supportive coparenting predictive relationships			Undermining Coparenting predictive relationships		
	$\beta$	<i>SE</i>	<i>p</i>	$\beta$	<i>SE</i>	<i>p</i>
Intercept	.06	.17	.724	.03	.16	.851
Measurement 2	.01	.08	.901	.01	.07	.886
Parent	-.04	.08	.617	-.09	.07	.199
Parental anxiety	-.06	.04	.134	.11**	.04	.006
Child fear_ <i>t</i>	.00	.04	1.000	.03	.04	.453
Child fear_ <i>t</i> +1	-.02	.04	.617	.08*	.04	.046
Support_ <i>t</i>	.62**	.04	<.001			
Undermining_ <i>t</i>				.45**	.05	<.001

Note: The models test the predictive associations between predictors at *t* and respectively, support at *t*+1 and undermining at *t*+1 (see Methods). All continuous predictor and outcome variables were transformed into z-scores. \**p* < .05, \*\**p* < .01

## DISCUSSION

The current study had four goals, namely to investigate: (I) the concurrent and predictive bidirectional relations between coparenting and child fearful temperament; (II) the relations between parental anxiety disorder and coparenting behaviors; (III) the moderating role of parental anxiety disorders in these associations; and (IV) the differences between mothers and fathers in these relations. First, with regard to supportive coparenting we found (a) no concurrent or predictive bidirectional relations between child fearful temperament and supportive coparenting; (b) no relations between parental anxiety disorder and supportive

<sup>1</sup> All analyses were also conducted with marital satisfaction included as a control variable. All main results were replicated.

coparenting; (c) no moderating role of parental anxiety disorders in the relations between child fearful temperament and supportive coparenting; and (d) no differences between fathers and mothers in the relations between child fearful temperament and supportive coparenting. Second, for undermining coparenting we found (a) a concurrent relation between more undermining coparenting and more concurrent child fearful temperament; (b) no predictive associations between undermining coparenting and child fearful temperament or vice versa; (c) a positive relationship between more parental anxiety disorder severity and more undermining; (d) no moderating role of parental lifetime anxiety disorder severity in the relations between child fearful temperament and undermining coparenting; and (e) no differences between fathers and mothers in the models of undermining and child fearful temperament.

For the relations between supportive coparenting and child fearful temperament, we hypothesized that supportive coparenting is negatively related to child fearful temperament, concurrently as well as predictively. However, none of the expected negative relations between supportive coparenting and child fearful temperament were found. This is not in line with most previous research, in which it has been replicated that more difficult child temperament correlates with less concurrent supportive coparenting (Gordon & Feldman, 2008; Schoppe-Sullivan et al., 2007; Van Egeren, 2004). Similarly, we did not find predictive relations from supportive coparenting to child fearful temperament or vice versa. This is a replication of the results by Solmeyer and Feinberg (2011) who also used McHale's (1997) Coparenting Scale to measure supportive coparenting. Interestingly, studies that did find longitudinal associations between supportive coparenting and child difficult temperament used observed triadic data (Davis et al., 2009; Laxman et al., 2013). Hence, from these results it appears that self-reports of support towards the partner might be unrelated to infants' temperament, whereas perceptions of received coparenting (Van Egeren, 2004) or observational data of support in the triad (Davis et al., 2009; Laxman et al., 2013) are related to infants' difficult temperamental characteristics. An explanation of these results is that parents' judgements of their own positive behaviors are more susceptible to socially desirable answers than partner's and observers' ratings of these behaviors. The results of previous research thus suggest that to study the relation with infant temperament, observations of supportive coparenting or reports of partners' support might be more valid measures than self-ratings. These hypotheses regarding the best measurement of supportive coparenting need to be tested in future research. As was also pointed out by Van Egeren (Van Egeren, 2004; Van Egeren & Hawkins, 2004), the measurement of coparenting is difficult and it is of high importance that researchers in coparenting consider these measurement issues when interpreting and comparing results.

For undermining coparenting, we found relations between undermining and child fearful temperament in the concurrent model. This is in accordance with our hypothesis that the environment of undermining coparenting creates feelings of emotional unsafety in

the child and that, vice versa, a fearful child puts extra strains on the coparenting alliance, leading to more stress resulting in more undermining coparenting (Majdandžić et al., 2012). Our results are in line with previous findings that general difficult child temperament and concurrent undermining coparenting are positively related (Lindsey, Caldera, & Colwell, 2005). Contrary to expectations, we did not find a predictive relationship from undermining to subsequent child fearful temperament. Thus, the level of undermining at a given age appears to predict only the level of fearful temperament in the child at the same moment and not in the future. These results were not in line with our expectation that a predictive relation would exist both from more undermining to more later child fear, and from more child fearful temperament to more later undermining. However, the results are in line with the results of Solmeyer and Feinberg (2011) who found no relations between self-reports of child difficult temperament and later self-reported undermining. Also the observational study of Davis et al. (2009) found no association between undermining coparenting and later child difficult temperament, and vice versa. Hence, research thus far does not point towards a predictive association between child temperamental characteristics and undermining coparenting. An exception to these findings was the research done by Laxman et al. (2013), who found a longitudinal association from child difficult temperament to more undermining coparenting, but only when fathers had a high score on negative emotionality. Given that we did not find a moderating role of parental anxiety in the associations between child fearful temperament and undermining coparenting (see the following paragraph), it might be the case that parents' personality traits such as negative emotionality play a meaningful role in the predictive associations between child fearful temperament and undermining coparenting. However, the result by Laxman et al. (2013) needs to be replicated in the future.

The current study was the first to investigate the relations between parental anxiety disorder and coparenting behaviors. Based on the model of Majdandžić et al. (2012) and on previous findings on parental negativity (Belsky, Crnic, & Gable, 1995) and depression (Isacco, Garfield, & Rogers, 2010), we expected that highly anxious parents' coparenting differs from the coparenting behavior of less anxious parents. In their model, Majdandžić et al. (2012) propose several mechanisms that might be at play when one of the coparenting partners is anxious, through which parents might become either more undermining or more supportive when one of the partners is highly anxious. Our results are in line with the reasoning that parents are more undermining when a parent is high on anxiety disorder severity: we found that higher parental anxiety disorder severity before birth of the child was related to more undermining coparenting at 4 months, 12 months and 30 months. From our results it can be concluded that parents who are highly anxious also are more undermining. It remains unclear whether the partners of these anxious parents also become more undermining. Unraveling these dynamics in families who have an anxious partner might be an interesting question for future research, since this can give additional

information in the development of clinical interventions. We conclude that parental anxiety plays a role in the undermining coparenting behavior of parents and should be included in future research on coparenting.

Our results thus show that undermining coparenting is both related to more child fearful temperament and to more parental anxiety. Interestingly, we did not find associations between parents' lifetime anxiety disorder severity and the temperamental fearfulness of their children, even though ample evidence exists for the intergenerational transmission of anxiety (Hettinga, Neale, & Kendler, 2001). Minuchin (1985) pointed to coparenting as the executive subsystem in the family and our results lend partial support to this claim. Our results point to undermining coparenting as a possible mechanism in the transmission of anxiety from parents to their children: when parents are anxious, they may become more undermining, which in turn is related to more fearfulness in the child. However, given the lack of predictive associations between coparenting and child fearful temperament, this role of undermining in the intergenerational transmission of anxiety is a hypothesis that needs to be tested in future research.

We hypothesized highly anxious parents to be more vulnerable to the stressor of having a temperamentally fearful child than non-anxious parents (Crockenberg & Leerkes, 2003). Therefore we expected to find a moderating effect of parental anxiety disorder severity in the relations between coparenting and child fearful temperament. We expected parents with a high anxiety disorder severity to show stronger associations between more child fearful temperament and less supportive coparenting and more undermining coparenting than parents with a low anxiety disorder severity. However, we did not find this moderating effect. Even though we were the first to study the relationship between parental anxiety disorders and coparenting, others have looked at the relationship between parental negative emotionality and coparenting. Laxman et al. (2013) also found no moderating role of negative emotionality in the relations between child difficult temperament and supportive coparenting, but these authors did find a moderating effect of fathers' negative emotionality in the relations between undermining coparenting and child difficult temperament. The lack of a moderating role for parental anxiety could be due to the fact that more general characteristics such as personality (e.g., negative emotionality) are more strongly related to child outcomes and coparenting behaviors. Future research should again look into the role of parental anxiety in the relations between coparenting and child fearful temperament, because we did find a relation between coparenting and child outcomes, as well as between parental anxiety and coparenting behaviors.

With respect to parent gender, we found that child fearful temperament and coparenting are related in the same way for both fathers and mothers, as did Solmeyer and Feinberg (2011), whereas others (Lindsey, Caldera, & Colwell, 2005; Schoppe-Sullivan et al., 2007; Van Egeren, 2004) have found differences in the relations between undermining and child fearful temperament between parents. These different findings may be due to differences in

methodology. Only Van Egeren (2004) and Solmeyer and Feinberg (2011) measured both coparenting and child temperament separately for both parents (as we did). Other research did not differentiate between the perceptions of temperament of mothers and fathers (Lindsey, Caldera, & Colwell, 2005) or did not differentiate between coparenting behaviors of mothers and fathers (Davis et al., 2009; Laxman et al., 2013). In order to validly assess coparenting differences between mothers and fathers, perceptions of both parents should be used in future research.

Even though effect sizes in the current study are small, this was expected based on the meta-analysis of Teubert and Pinquart (2010), which also found only small effect sizes for coparenting in relation to internalizing problems in children. As also noted by Teubert and Pinquart (2010), different aspects of family dynamics (such as individual parenting style, dyadic parent-child dynamics, and coparenting) have relatively small effects on the child, but the cumulative effects of these interrelated aspects may be stronger. Effects of coparenting might become stronger later in childhood, when dynamics become more stable and have influenced development over a longer period of time. Future research should consider longitudinal measures of coparenting over a longer developmental period, to investigate whether effects become stronger over time.

Several limitations of our study should be taken into consideration when interpreting and generalizing results. First, our sample consisted of mostly highly educated, married couples. Moreover, anxiety disordered parents were oversampled. These rather specific characteristics of our sample limit the generalizability of our results to the general population. It should be noted that our sample is not a clinical sample; thus, our results apply to parents with a relatively high score on lifetime anxiety disorder severity in the general population. Also, the limitations of self-report (social desirability and subjectivity) apply to our study and limit the validity of our results, and perhaps especially for highly anxious parents, as social anxiety may increase socially desirable answering tendencies. However, as also noted by McHale (2007), in coparenting research, self-reports can give valuable insights into the way parents *experience* the coparenting relationship, which might be a more important indicator of the coparenting quality than the actual behaviors that take place (Feinberg, 2003). For future studies, combining questionnaire data with observational data is a good solution to the problems concerning the measurement of coparenting. Also, a study with a larger sample size and more measurement occasions would provide more statistical power to investigate two-way and three-way interactions in the models, which makes it possible to draw more robust conclusions regarding the processes underlying the relations between coparenting and fearful child temperament as well as differences in these relations between fathers and mothers.

The current study also had several strengths. We used a longitudinal design to investigate predictive as well as concurrent relations over three measurement occasions, making causal implications possible. We included interactions in these models to provide insights into

family dynamics underlying the development of child fearful temperament and coparenting. We assessed fathers and mothers, making it possible to differentiate between paternal and maternal roles in the relations between coparenting and child fearful temperament. Our study was the first to include a measure of anxiety disorders, rather than personality traits in the study of coparenting. Our results imply that parental anxiety disorder is negatively related to the quality of the coparenting relationship and should therefore be further investigated in future research on coparenting. Finally, all analyses were also conducted with marital satisfaction included as a predictor. All results in the models that include marital satisfaction were similar to the results presented without marital satisfaction. This strengthens the evidence that coparenting and marital satisfaction are two separate constructs and that the coparenting alliance is a meaningful target for intervention, as was also pointed out by others (e.g., Chen & Johnston, 2012; Feinberg, Kan, & Goslin, 2009).

Our results have several clinical implications. We found that more parental anxiety disorder severity was related to more undermining coparenting, and we found that fearfulness in the child and undermining co-occur. These results suggest that undermining coparenting is an important novel parenting factor to consider in understanding the causes and effects of child fearful temperament. Therefore, undermining coparenting should be considered as a target in the prevention and treatment of child anxiety. It might be especially helpful to offer parents with lifetime anxiety disorders help with their coparenting relationship in order to dissolve the links between child fearful temperament and coparental undermining. Feinberg and colleagues (Feinberg & Kan, 2008; Feinberg, Kan, & Goslin, 2009) were the first to design an intervention directed at coparenting. Their studies demonstrate that the Family Foundations intervention (administered in 8 sessions, prenatally until 6 months after birth) is related to higher coparental support but not to lower undermining, and to lower infant soothability (part of the ‘difficult temperament’ dimension). Given that our results point to an especially important role of undermining coparenting in relation to child fearful temperament, future research needs to further investigate coparenting as a target in the treatment of both anxious parents and anxious children. More specifically, we recommend a focus on the development of an intervention that targets undermining coparenting.

## CONCLUSION

The current study investigated the relations between coparenting and child fearful temperament and the current study was the first to investigate the role of parental anxiety disorder severity in relation to coparenting. We found that more undermining coparenting is related to more child fearful temperament. In addition, we found that more parental anxiety is related to more undermining coparenting. Interestingly, no results were found for supportive coparenting, leading us to conclude that it is especially undermining coparenting that is of interest in relation to child fearful temperament and parental anxiety. No differences between fathers and mothers were found in the current study.

Given the relations between parental anxiety disorder and undermining, and between undermining and child fearful temperament, we suggest that undermining coparenting might be one of the mechanisms that contribute to the intergenerational transmission of anxiety from parent to child. We therefore conclude that undermining coparenting should be considered in the treatment of parents with lifetime anxiety disorders and in the treatment of child anxiety. It remains unclear whether and why supportive and undermining coparenting relate differently to child fearful temperament and child anxiety, this needs to be addressed in future research.