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When Father Steps Forward and Mother Steps Back: The Moderating Role of Simultaneity in Parents' Coparenting Behaviors in the Development of Anxiety in 4- to 30-Month-Olds

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Infant negative affectivity predicts child anxiety. Coparenting might influence the development of anxiety by weakening this association in the case of supportive coparenting, or by strengthening this association in the case of undermining coparenting. Parents can display coparenting behaviors simultaneously (both parents being supportive or undermining), or divergently (only one parent being supportive or undermining). In our longitudinal study, we investigated whether coparenting moderated the relation between infant negative affectivity at 4 months and child anxiety symptoms 2 years later. Hundred-sixteen couples dressed up their firstborn infants in a clothes-changing task. We coded cooperative, mutual, neutral, and competitive coparenting behaviors. Both parents rated infant negative affectivity and child anxiety symptoms. Infant negative affectivity significantly predicted child anxiety. This association was moderated by parents' divergent cooperative coparenting: It was stronger when mothers were cooperative while fathers were neutral, and weaker when fathers were cooperative while mothers were neutral. When fathers step forward (i.e., being cooperative) and mothers step back (i.e., leaving space), they may protect their at-risk child from developing anxiety.

Relationships are crucial determinants of child development: positive mother-child and positive father-child relationships predict less child internalizing and externalizing problems (e.g., Colonnesi et al., 2011; Möller, Nikolić, Majdandžić, & Bögels, 2016; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989; Rinaldi & Howe, 2012; Rutter, 1990). Researchers have begun to study not only the valence of interactions

(i.e., positive vs. negative interactions), but also the way in which people interact (Harrist, Pettit, Dodge, & Bates, 1994; Harrist & Waugh, 2002; Lindsey, Cremeens, Colwell, & Caldera, 2009). For example, mutual positive affect between parents and their child, occurring when parents and their child display positive affect at the same time, has been found to be related to children's self-control and communicative competence at the age of 3 years (Lindsey et al., 2009). In addition, the display of mutual negative affect in mother-child interactions has been found to be related to more internalizing problems at the age of 5 years (Harrist et al., 1994). These studies suggest that the qualitative patterns of interactions play a meaningful role in the prediction of child outcomes.

Next to the mother-child and father-child relationship, another important relationship in the family environment is the coparenting relationship. Coparenting is defined as "the ways that parents and/or parental figures relate to each other in their role as parents" (Feinberg, 2003, p. 96). Minuchin (1974) argued that, because parents regulate the family through their joint family management, coparenting interactions serve as the executive subsystem of the family. Thus, parents' regulation of family interactions through coparenting might be one of the mechanisms that influence child development.

Coparenting is generally divided into supportive coparenting (i.e., affirming the partner's competencies as a parent and respecting the partner's parenting contributions; Feinberg, 2003) and undermining coparenting (i.e., criticism, disparagement and blaming of the partner's parenting; Belsky, Woodworth, & Crnic, 1996; McHale, 1995). A meta-analysis demonstrated that supportive coparenting is related to less child internalizing problems (such as anxiety and depression), whereas undermining coparenting is related to more child internalizing problems (Teubert & Pinquart, 2010). However, research relating coparenting to specific disorders is scarce. Recently, researchers hypothesized that coparenting plays a role in the maintenance of anxiety disorders in families (Majdandžić, de Vente, Feinberg, Aktar, & Bögels, 2012). Specifically, it is hypothesized that a coparenting relationship that is characterized by high levels of undermining and low levels of support can provide an unsafe family environment, which can induce anxiety in the child. On the other hand, a coparenting relationship that is characterized by high levels of support and low levels of undermining can protect children from the development of anxiety. As early child anxiety increases the risk for later child anxiety disorder, for the development of more anxiety problems, and for depression, knowledge regarding the development of anxiety is important (Beesdo-Baum & Knappe, 2012). The quality of the coparenting relationship is an early factor that influences child development and may, therefore, play an influential role in the development of child anxiety.

Research addressing the relations between coparenting and measures of child anxiety is scarce. To our knowledge, only one study directly studied child anxiety and found that undermining coparenting in infancy related to less teacher-reported child anxiety at 4 years (McHale & Rasmussen, 1998). Temperamental negative affectivity (proneness to the experience of negative emotions, often denoted difficult temperament; e.g., Watson & Clark, 1984) has been identified as a risk factor for the development of later child anxiety (Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Hirshfeld et al., 1992). Studies on child temperament and coparenting found that child negative affectivity in 3.5-month-olds to 3-year-olds is related to less supportive coparenting and to more undermining coparenting, and vice versa. These results were found both

concurrently (e.g., Gordon & Feldman, 2008; Metz, Majdandžić, & Bögels, 2016; Schoppe-Sullivan, Mangelsdorf, Brown, & Sokolowski, 2007) and longitudinally (e.g., Davis, Schoppe-Sullivan, Mangelsdorf, & Brown, 2009; Laxman et al., 2013). However, one study with 3- to 5-year-olds found no direct associations between observed and self-report measures of coparenting and child temperament (Stright & Bales, 2003). In sum, global, content-based measures of coparenting have been found to be related to infant negative affectivity; however, relations between coparenting and child anxiety remain relatively unexplored.

In addition to direct relations between child temperament and coparenting, several studies have identified coparenting behavior as a moderator in the association between infants' temperamental characteristics and developmental outcomes. For instance, 1- to 5-year-olds with high levels of negative affectivity showed an increase in internalizing behaviors (behaviors such as being shy, withdrawn, or moody) after the birth of a sibling only when their parents were high on undermining before the birth of the second child (Kolak & Volling, 2013). In contrast, no associations were found between child negative affectivity and later internalizing problems when parents scored low on undermining. Similar protective moderating effects of high levels of supportive coparenting behaviors and low levels of undermining coparenting behaviors have been found for child temperamental dysregulation (Altenburger, Lang, Schoppe-Sullivan, Dush, & Johnson, 2017) and externalizing behavior problems (Schoppe-Sullivan, Weldon, Cook, Davis, & Buckley, 2009).

That coparenting can serve as a moderator in child development is in line with the goodness-of-fit theory, which states that developmental outcomes can be predicted by an interaction between infant temperament and the infant's environment (Thomas & Chess, 1977). Thus, the risk for psychopathology is higher in infants with a highly negative temperament who are growing up in an adverse environment (e.g., with undermining coparents) compared to infants with a highly negative temperament who are growing up in a protective environment (e.g., with supportive coparents). Minuchin (1974) suggested that coparenting may be a determining factor in the (mis)match between infant temperament and family adjustment. Thus, coparenting should not only be considered as a direct effect, but also as a moderator in the study of child anxiety.

Up until now, coparenting research focused on the content of coparenting interactions (i.e., positive/supportive or negative/undermining) rather than on the way coparents interact in terms of observable interaction patterns, such as timing of behaviors between partners (whether these are concurrent, consecutive, or unrelated) and flexibility (parental turn-taking and the range of behaviors parents demonstrate in coparenting interactions). As a consequence of the focus on broad, content-based coparenting dimensions in coparenting research, studies on coparenting have thus far provided limited insight into which interaction patterns between mothers and fathers constitute the quality of the coparenting relationship. Therefore, we sought to investigate to what extent the interplay between coparents affects the development of anxiety in children.

A commonly used measure in research on interactional dynamics is synchrony, which can be defined as "an observable pattern of dyadic interaction that is mutually regulated, reciprocal, and harmonious" (Harrist & Waugh, 2002, p. 557). Synchrony is a term that is used in several ways: some researchers refer to synchrony in terms of consecutive behaviors; for example, mother smiles and the infant follows this behavior by smiling also, whereas others refer to synchrony in terms of simultaneous or concurrent behaviors; for example, mother and infant smile at the same moment in time

(Harrist & Waugh, 2002). In the current study, we investigated the simultaneous type of synchrony and refer to it as ‘simultaneity’.

Simultaneity between parents and their child has been related to developmental outcomes such as self-regulation, symbol use and the capacity to display empathy in childhood and adolescence (Feldman, 2007). Research on romantic relationships and cooperation in general found that more simultaneous behaviors relate to more affective relationships, higher relationship satisfaction, and higher quality cooperation (Harrist et al., 1994; Hove & Risen, 2009; Julien, Brault, Chartrand, & Bégin, 2000; Thomassin & Suveg, 2014; Valdesolo, Ouyang, & DeSteno, 2010). For example, couples who simultaneously changed their body position and body openness during conversation were more satisfied with their relationship than couples who differed in the timing of these behaviors (Julien et al., 2000). Also, research has demonstrated that the perception of the co-occurrence of behaviors in others by a third person was related to a more positive interpretation of the relationship by the observers (Miles, Nind, & Macrae, 2009). Thus, both the participation in a highly simultaneous interaction and the perception of a highly simultaneous interaction relate to a more positive judgment of the relationship.

Even though simultaneity has been investigated in parent-child interactions and in interactions between romantic partners, to our knowledge the role of the co-occurrence of behaviors between parents in the presence of their child has not yet been studied. On one hand, the results of previous research suggest that children who perceive their parents’ coparenting behaviors as highly simultaneous might obtain a positive view of their parents’ relationship, which in turn could increase their feelings of safety and reduce anxiety. On the other hand, highly simultaneous coparenting interactions may predict poorer child outcomes, because this may indicate high dependence between partners. Highly simultaneous coparenting might signal that parents are less capable of adjusting their behaviors to their child or that they are unable to give space to each other to interact with the child at an individual level. Highly simultaneous behavior may thus be low in flexibility. Low levels of flexibility in parent-child interactions (operationalized as a relatively limited number of emotional states expressed by the parent-child dyad) have been found to be a risk factor for the development of internalizing behavior problems (Hollenstein, Granic, Stoolmiller, & Snyder, 2004). Thus, simultaneity in coparenting may be related to more positive child outcomes, but could also be related to more negative child outcomes.

The goal of the current study was to investigate whether coparenting behaviors and simultaneity in coparenting contribute to the stability or change in the development from infant negative affectivity to later child anxiety. We thus investigated the moderating role of coparenting in this development. Using longitudinal questionnaire data when the child was 4 months and 2.5 years old and observational measures of coparenting during a home visit when the child was 1 year old, we investigated several associations. First, we investigated the relation of parents’ observed coparenting at 1 year with parent-reported infant negative affectivity at 4 months and with parent-reported child anxiety symptoms at 2.5 years. Second, as a qualitative measure of coparenting, we investigated the relation of parents’ simultaneity in their coparenting behaviors at 1 year with infant negative affectivity at 4 months and child anxiety symptoms at 2.5 years. We distinguished specific patterns of simultaneity in coparenting: simultaneous coparenting occurred when parents displayed the same coparenting behavior at the same moment in time, whereas divergent coparenting occurred when parents displayed

different coparenting behaviors at the same moment in time. Third, we studied coparenting at 1 year (behavior and simultaneity) as a moderator of the relation between infant negative affectivity at 4 months and child anxiety symptoms at 2.5 years. In order to construct measures of coparenting simultaneity, we observed coparenting behaviors on a micro-level, as suggested by Gordon and Feldman (2008). In addition, we coded infant emotionality to control for effects of the infant's emotional state during the task.

The current study had three hypotheses: (1) we expected that higher levels of infant negative affectivity at 4 months predict higher levels of child anxiety symptoms at 2.5 years, and that supportive coparenting behaviors at 1 year predict less child anxiety symptoms at 2.5 years, whereas undermining coparenting behaviors predict more later child anxiety symptoms; (2) we expected that for families with low coparenting quality (i.e., infrequent supportive behaviors and frequent undermining coparenting behaviors), the relation between infant negative affectivity and later child anxiety symptoms would be stronger than for families with high coparenting quality (i.e., frequent supportive coparenting behaviors and infrequent undermining coparenting behaviors); (3) we explored the direct effect and the moderating effect of coparenting simultaneity in the relation between early infant negative affectivity and later child anxiety symptoms.

METHOD

Participants

In the current study, 116 mothers, fathers and their first-born infants participated (60 girls).¹ This study is part of an ongoing longitudinal study on the antecedents of social anxiety in young children (*The Social Development of Children*). Couples expecting their first child were recruited via advertisements in magazines and flyers distributed by midwives. Families received a gift voucher after completing each measurement. All included families had singletons and birth weights ranged from 2,100 g to 4,965 g ($M = 3,531$ g, $SD = 553$ g); for three families, birth weight was not reported. Birth weights lower than 2,500 g are considered low (World Health Organization, 1961). Based on this criterion, the birthweight of seven children (1 girl) in our sample was considered low ($M = 2,324$ g, $SD = 121$ g, range: 2,100–2,450 g). All children were born after 37 weeks or more. The ethical committee approved the research and all participants provided written informed consent. One-hundred-sixteen families participated at child age 4 months ($M = 4.19$ months, $SD = 0.32$), 102 at 1 year ($M = 12.35$ months, $SD = 0.70$), and 106 at 2.5 years ($M = 30.07$ months, $SD = 0.44$). Dropout was mainly due to couples indicating that the research was taking up too much of their time.

Fathers' age when children were 4 months old ranged from 22 to 59 years ($M = 33.80$, $SD = 5.35$), mothers' age ranged from 20 to 42 years ($M = 31.00$, $SD = 3.94$). Fathers and mothers were generally highly educated ($M = 6.92$, $SD = 0.96$ and $M = 7.18$, $SD = 1.02$, respectively), measured on a scale from 1 (*finished primary school*) to 8 (*finished university*). When children were 4 months old, 95% of couples were married or cohabiting, 2% of couples filled out "other", and 5% did not fill out

¹In the longitudinal study of which our study is part, total N 's are: 4 months $N = 139$; 1 year $N = 132$; 2.5 years $N = 124$. Only families with data for measures used in the current study were included.

their marital status. At 1 year, 94% of couples were married or cohabiting, 1% of couples were divorced, 1% filled out “other”, and 4% did not fill out their marital status. At 2.5 years, 84% of couples were married or cohabiting, 2% of couples were divorced, 3% of couples filled out “other”, and 11% did not fill out their marital status. We first ran all models for the whole sample and then reran all models with only married or cohabiting couples. Results of the models were highly similar for the whole sample and for married or cohabiting couples only; therefore, we reported all results for the whole sample.

Procedure

In the longitudinal study, parents participated in a prenatal measurement including an interview and several questionnaires. When children were 4 months, 1 year and 2.5 years old, fathers and mothers separately came to the research lab with their infant to conduct structured tasks and filled out a number of questionnaires about their child and their parenting behaviors. Families also took part in a home visit with several tasks. In the current study, we used questionnaire data about temperament from the 4-month measurement, observations of coparenting from the home visit at 1 year, and questionnaire data about child anxiety from the 2.5-year measurement.

Measures

Infant negative affectivity

At 4 months, fathers and mothers completed the Revised Infant Behavior Questionnaire (IBQ-R; Gartstein & Rothbart, 2003). The IBQ-R assesses infant temperament from 3 months to 1 year and consists of 14 scales with 191 items that are rated on a 7-point Likert scale from 1 (*never*) to 7 (*always*). Parents were asked how often, during the past 7 days, their child displayed specific behaviors. For the current study, we created the dimension of negative affectivity by averaging the following scales: sadness (14 items; e.g., “Did the baby seem sad when the caregiver was gone for an unusually long period of time?”), distress to limitations (16 items; e.g., “When placed on his/her back, how often did the baby fuss or protest?”), fear (16 items; e.g., “How often during the last week did the baby startle to a sudden or loud noise?”), falling reactivity (reversed, 13 items; e.g., “When frustrated with something, how often did the baby calm down within 5 min?”), and soothability (reversed, 11 items; e.g., “When patting or gently rubbing some part of the baby’s body, how often did s/he soothe immediately?”). Cronbach’s α across these five scales of negative affectivity was .76 for mothers and .79 for fathers. Father’s and mother’s scores for negative affectivity were significantly correlated ($r(93) = .40, p < .001$); therefore, a father-mother composite score was created by averaging fathers’ and mothers’ scores.

Child anxiety symptoms

At 2.5 years, fathers and mothers completed the Dutch version of the revised Preschool Anxiety Scale (PAS-R, Broeren & Muris, 2008; Edwards, Rapee, Kennedy, & Spence, 2010) to measure child anxiety symptoms. Using 30 items, the PAS-R measures five anxiety disorders: social, generalized, separation, specific phobias, and OCD. In line

with DSM-V criteria, the two items measuring OCD were not included. This is also in line with the previous use of the scale (Broeren, Muris, Diamantopoulou, & Baker, 2013; Edwards et al., 2010). The average of the remaining 28 items was used as a measure of child anxiety symptoms. Examples of items are “My child is afraid of loud noises” and “My child worries about doing the right thing”. Items were rated on a Likert scale from 1 (*not at all true*) to 5 (*very often true*). The scale has good construct validity and internal consistency (Broeren & Muris, 2008; Edwards et al., 2010). Cronbach’s α was .89 for mothers’ ratings and .93 for fathers’ ratings. Mothers’ and fathers’ ratings of their child’s anxiety were significantly correlated, $r(88) = .53, p < .001$; therefore a composite score was calculated by averaging fathers’ and mothers’ scores.

To inspect whether children in the current sample qualified as clinically anxious, we compared our sample to the sample from Edwards et al. (2010) who validated the PAS-R. Edwards et al. (2010) reported means and *SD*’s for a subsample of children without anxiety diagnoses ($M = 23.33, SD = 8.52$) and a subsample of children with one or more anxiety diagnoses ($M = 61.22, SD = 15.11$). We recalculated the scores on our data to a scale from 0 (*not at all true*) to 4 (*very often true*) and calculated sum scores (rather than average scale scores), in order to compare our scores to the scores of Edwards et al. (2010). Compared to both of their samples, the children in the current study had significantly lower scores on child anxiety symptoms ($M = 12.89, SD = 11.03$), $t(90) = -2.98, p = .004$. Hence, the children in the current should be seen as a sample from the general population, with subclinical scores on child anxiety symptoms.

Coparenting

Coparenting behaviors were assessed at 1 year using a task in which parents were asked to change the infant’s clothes. In order to assess parents’ coparenting in a natural but controlled setting, parents were instructed to change their child together into a clown’s suit, including trousers, a jacket (opening at the front), and a hat. Parents were instructed to dress up the child together and to act as they normally would. Clothes changing tasks have been used previously in coparenting research (e.g., Schoppe-Sullivan et al., 2007; Umemura, Christopher, Mann, Jacobvitz, & Hazen, 2015), in order to involve parents in a task that has a joint goal and thereby induces collaboration (Schoppe-Sullivan et al., 2007). Parents could freely choose whether they wanted to put the clothes over the child’s own clothing or to first undress the child. Trained graduate students conducted the home visits and videotaped the interaction with a handheld digital camera. Parents varied in the time it took them to dress their child from 51 to 185 sec ($M = 99.00, SD = 28.9$).

Coding coparenting. Coparenting behaviors were micro-coded using Observer XT 10.5 software (Noldus, Trienes, Hendriksen, Jansen, & Jansen, 2000), which allows for 1 sec exactness. Coders assigned scores based on event-sampling, providing data on the duration of behaviors. Coding of the observations started as soon as the test leader finished the task instructions. Coding ended when parents put the last piece of clothing on the child and the test leader began to talk again in order to continue with the next task. Data were coded by three trained graduate level students (training reliability = $\kappa > .80$) and the first author. Observers coded both mothers and fathers within the same interaction. The order in which families were coded was randomized.

To our knowledge, the only previous study using micro-coding for coparenting was Gordon and Feldman (2008). We based our coding system on the system described by Gordon and Feldman (2008), which included the categories of Competitive, Neutral/Passive, and Mutual. Within Neutral/Passive, we distinguished neutral and passive behaviors as separate categories, and we added the behavioral category of cooperation. The behavioral categories were coded as follows:

- 1 Competitive – Competitive behaviors are behaviors that are clearly and explicitly negative towards the partner and interfere with the partner’s social attempts towards the child, such as disagreeing with the partner’s initiatives, ignoring or excluding the partner, and competing for the child’s attention.
- 2 Passive – Passive behaviors occurred when the parent was not engaged in the task (for example, on the phone, or talking about the groceries). As passive behaviors did not occur in our sample (for mothers in 0% of observations, $n = 0$; for fathers in 0.57% of all observations, $n = 2$), passive behaviors were not included in further analyses.
- 3 Neutral – Neutral behaviors occurred when the parent was engaged in the task, but was not performing any coparenting initiatives (for example, the parent is watching while their partner dresses the child).
- 4 Mutual – Mutual behaviors are behaviors that are clearly positive towards the partner and reinforce the presence of the partner, such as involving the partner in the interaction (“Daddy, can you put on the hat?”), giving compliments to the partner (“Mommy is always so good at making you smile!”), and talking about the triad (“Now, you, mommy and I are going to change your clothes!”).
- 5 Cooperation – We extended the behavioral categories of Gordon and Feldman (2008) with the category of cooperative behaviors in order to create a mutually exclusive and exhaustive coding system, because some common behaviors were not captured in the original categories. Cooperative behaviors are behaviors that show responsivity to the partner, but that are not explicitly positive, such as asking and answering questions, agreeing, and going along with the partner’s initiatives.

For further analyses, we calculated the percentage of the total duration of the observation that the behavior occurred for every behavioral category. Due to the low occurrence of mutual behaviors (2.35% of the time of all interactions) and of competitive behaviors (0.89% of the time of all interactions), we used a dichotomous score of mutuality and competition in the correlation analyses and we calculated point-biserial correlations for these two categories. The dichotomous scores reflected whether the behaviors did or did not occur in the family. In the multivariate analyses, we did not include the dichotomous measures of mutuality and competition.

Twenty-three percent ($n = 24$) of the data were double coded by all four coders to determine inter-rater reliability. Reliability was calculated across all coding categories together. Reliability of the coding scheme for coparenting behavior was good for mothers and for fathers ($\kappa = .69$ and $\kappa = .72$, respectively).

Simultaneity measures. We calculated the extent to which parents showed simultaneous coparenting behaviors using neutral and cooperative coparenting behaviors.

Coparenting simultaneity was computed using the nesting procedure (i.e., temporal co-occurrence) of Observer XT. Four types of simultaneity were identified:

- 1 *Simultaneous cooperation (both parents cooperative)* when both father and mother were performing cooperative coparenting at the same moment in time (e.g., father holds the child's legs while mother puts on the pants, or mother dresses the child while father at the same time says "You are going to be a very beautiful clown, you see?!").
- 2 *Only mother cooperative (mother cooperative – father neutral)* when mother was cooperative while father was neutral (e.g., mother puts on the child's pants because father asked her to do so, while father is sitting next to mother and child; mother asks father "Can you hold the hat?" while father is waiting for mother to put on the pants).
- 3 *Only father cooperative (mother neutral – father cooperative)* when mother was neutral while father was cooperative (e.g., father answers a question that mother asked while mother waits for father's answer; father asks mother "Should I put on the trousers now?" while mother is sitting next to father and child).
- 4 *Simultaneous neutral (both parents neutral)* when both father and mother were present at the task, but were not initiating any collaborative behaviors (e.g., father and mother are watching the child as the child is exploring the clothes).

We did not include the 'simultaneous neutral' category in the analyses, because we were interested in the presence of simultaneity in active coparenting, rather than in simultaneous passive forms of coparenting. For further analyses, we calculated the percentage of the total duration of the observation that each type of simultaneity occurred.

Coding infant emotionality

During the coparenting task, we coded infant emotionality per observation in order to control for infants' level of affect and pleasure during the dressing-up, because the infants' state could influence the coparenting behavior of the parents. Infants emotionality was coded on a three-point scale: (1) *negative affect*: infant is crying, screaming or verbally stating that they do not enjoy the task, (2) *neutral affect*: infant is not expressing strong positive or negative emotions, and (3) *positive affect*: infant is laughing, smiling or verbally stating that they enjoy the task. Infant emotionality was coded by two trained undergraduate students using 28% ($n = 29$) of the data. Inter-rater reliability was excellent ($\kappa = .93$).

Data analyses

First, Pearson's correlations were performed to test the associations between the study variables: child negative affectivity, child anxiety symptoms, cooperative coparenting, simultaneous coparenting (both cooperative) and divergent coparenting (mother cooperative – father neutral, and mother neutral – father cooperative). For the dichotomous measures of mutual coparenting and competitive coparenting, we ran point-biserial correlations. Next, path analyses were performed to test relations

between infant negative affectivity, coparenting behaviors and simultaneity, and child anxiety symptoms, as well as moderation effects of coparenting behaviors and simultaneity on these relations. Path models were analyzed in R (version 3.3.0) using the lavaan package (Rosseel, 2012).

In the path models, we included paths based on our hypotheses that infant negative affectivity predicted subsequent child anxiety symptoms and that coparenting behaviors predicted subsequent child anxiety symptoms. To test the moderating role of coparenting in the relationship between infant negative affectivity and child anxiety symptoms, we included an interaction effect between negative affectivity and coparenting as a predictor of child anxiety symptoms. Thus, construction of path models was theory-driven rather than data-driven (i.e., paths were included based on hypotheses and not based on their statistical significance).

Before constructing the path models, missing data were inspected. Only families who completed the home visit at 1 year and at least one other measurement were included in the current study. This resulted in a total of 102 families that were included in the path analyses.

We constructed three path models: one model tested the hypothesized associations for mothers' and fathers' cooperative coparenting, one model tested the hypothesized associations for simultaneous coparenting interaction patterns, and one model tested the hypothesized associations for divergent coparenting interaction patterns. Because all models were fully saturated, no fit indices were calculated and only significant paths were interpreted in the analyses. Full Information Maximum Likelihood (FIML) estimation was used to estimate the models. FIML assumes that data are missing at random; our data met this criteria (MCAR test, $\chi^2(65) = 83.9, p = .057$). All variables (both predictor and dependent variables) were standardized before entering them into the path models. Model paths were considered significant at the $\alpha = .05$ level.

RESULTS

Descriptive analyses

We investigated whether observed infant emotionality was correlated to the other study variables. We found that infant emotionality was not significantly related to cooperative coparenting, for mothers, $r(102) = .15, p = .119$ and for fathers, $r(102) = .15, p = .136$, and also not to coparenting simultaneity: for simultaneous coparenting, $r(102) = .17, p = .094$; for mother cooperative – father neutral, $r(102) = -.07, p = .462$; and for mother neutral – father cooperative, $r(102) = .02, p = .860$. Also infant emotionality was not significantly related to parent reports of the infants' negative affectivity, $r(102) = -.04, p = .680$, or to levels of child anxiety symptoms, $r(102) = .07, p = .543$. Infant emotionality was therefore not included in further analyses.

As some children in our sample had a low birth weight, we investigated whether children with low birth weight (<2,500 g) differed from children with normal birth weight. We first computed independent *t*-tests to compare mothers' and fathers' reports of infant negative affectivity and child anxiety symptoms. For these comparisons, we found that *t*'s ranged from |.02| to |1.51| and *p*'s ranged from .981 to .135. Next, we computed independent *t*-tests to compare our constructed measures of

TABLE 1
 Descriptives of Proportions of Observed Coparenting Behaviors, Proportions of Coparenting Simultaneity, Child Negative Affectivity, and Child Anxiety

	<i>M</i>	<i>SD</i>	<i>Range</i>
Mother			
Mutual coparenting	2.35	3.46	0.00–25.57
Cooperative coparenting	45.03	16.45	4.32–82.68
Neutral coparenting	51.77	16.63	17.32–92.13
Competitive coparenting	0.86	1.52	0.00–7.31
Father			
Mutual coparenting	1.18	1.93	0.00–9.63
Cooperative coparenting	45.49	16.47	1.26–82.31
Neutral coparenting	52.37	16.35	12.91–96.97
Competitive coparenting	0.38	0.97	0.00–4.33
Child			
Negative affectivity	2.69	0.41	1.89–3.82
Child anxiety symptoms	1.73	0.40	1.05–2.86
Simultaneity			
Both parents cooperative	39.85	17.15	0.00–77.39
Mother cooperative – father neutral	4.75	3.45	0.00–17.76
Mother neutral – father cooperative	4.48	3.49	0.00–15.26
Both parents neutral	46.31	15.84	12.40–87.30

coparenting synchrony between children with low and normal birth weight; t 's ranged from $|.27|$ to $|1.35|$ and p 's ranged from $.789$ to $.179$. Hence, we conclude that children with low birth weight did not differ from the other children and, therefore, all children were included in further analyses.

Descriptive statistics of the study variables are presented in Table 1. Mutual coparenting of mothers and fathers occurred in 56.86% and 45.10% of all observations, respectively. Competitive coparenting of mothers and fathers occurred in 36.27% and 18.63% of all observations, respectively. Neutral and cooperative behaviors were observed in all (100%) observations. The correlations between the study variables are presented in Table 2. The scores for fathers' and mothers' cooperative coparenting were highly correlated, $r(102) = .96$, $p < .001$; therefore, we constructed a composite score of mothers' and fathers' scores for cooperative coparenting. This composite score was used in all further analyses. In addition, the correlations revealed that the composite score of cooperative coparenting and simultaneous coparenting were highly correlated, $r(102) = .98$, $p < .001$; therefore, we only present the path model for the composite score of mothers' and fathers' cooperative coparenting. In addition, cooperative coparenting was significantly correlated with divergent coparenting of the type mother neutral – father cooperative, $r(102) = -.20$, $p = .041$; therefore, we added cooperative coparenting as a covariate in the path model of divergent coparenting.

We investigated whether mothers' and fathers' coparenting behaviors differed from each other. Paired t -tests revealed that mothers' and fathers' cooperative and neutral coparenting behaviors did not differ significantly, $t(101) = 1.32$, $p = .191$ and, $t(101) = -0.98$, $p = .330$, respectively. McNemar's test for comparing dependent dichotomous variables revealed that mothers showed significantly more mutual and

TABLE 2
Correlations Between Proportions of Coparenting, Proportions of Coparenting Simultaneity, Child Negative Affectivity, and Child Anxiety

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Proportions												
1. Mother mutual coparenting	-.07											
2. Mother cooperative coparenting	-.05	-.98**										
3. Mother neutral coparenting	.08	-.24*	.17									
4. Mother competitive coparenting	.47**	.03	-.10	.05								
5. Father mutual coparenting	-.11	.96**	-.95**	-.20*	.02							
6. Father cooperative coparenting	-.08	-.93**	.93**	.21*	-.03	-.96**						
7. Father neutral coparenting	-.04	.03	-.04	-.27**	-.03	.03	-.05					
8. Father competitive coparenting												
Simultaneity												
9. Simultaneous cooperation	-.11	.97**	-.93**	-.24*	-.07	.97**	-.93**	.02				
10. Mother cooperative – Father neutral	.20**	-.02	-.02	.03*	.34**	-.19	.20*	.01	-.27**			
11. Mother neutral – Father cooperative	-.16	.26**	.27**	.10	.15	-.14	.15	-.02	-.33**	.28**		
Child												
12. Negative affectivity	-.02	.05	-.04	.03	-.16	.09	-.08	.05	.11	-.23*	-.19	
13. Child anxiety symptoms	.03	.00	.00	.07	.06	.01	-.01	-.06	-.01	.02	.08	.27*

Note. * $p < .05$; ** $p < .01$.
Mutual and Competitive coparenting are included as dichotomous variables and correlations with these variables are point-biserial correlations.

competitive coparenting behaviors than fathers, $\chi^2(1, N = 102) = 4.32, p = .038$ and $\chi^2(1, N = 102) = 9.03, p = .003$, respectively.

Preliminary analyses were conducted to investigate whether infant gender and parents' demographic characteristics were related to measures of cooperative and neutral coparenting, infant negative affectivity and child anxiety symptoms. Mothers of boys showed a significantly higher percentage of cooperation than mothers of girls, $F(1, 99) = 4.42, p = .038$. Also, both mothers and fathers of boys showed a significantly lower percentage of neutral coparenting than mothers and fathers of girls, $F(1, 99) = 5.06, p = .027$, and $F(1, 99) = 4.35, p = .040$, respectively. No differences between boys and girls were found for simultaneity, infant negative affectivity or child anxiety. Correlation analyses revealed that when mothers had a higher educational level, mothers and fathers showed more cooperative coparenting, $r(102) = .23, p = .021$ and $r(102) = .22, p = .026$, respectively, and mothers and fathers showed less neutral coparenting, $r(102) = -.20, p = .041$ and $r(102) = -.22, p = .024$, respectively, and parents displayed more simultaneous cooperative coparenting, $r(102) = .22, p = .027$. Also, when mothers' income was higher, infants were perceived as lower in negative affectivity, $r(102) = -.20, p = .049$. No significant relations were found with parents' age, fathers' educational level, or fathers' income ($p > .05$). As we found that child gender, mothers' educational level and mothers' income related to the key variables of the current study, we ran path models with and without child gender, mothers' educational level, and mothers' income level as control variables. Results with and without control variables were highly similar. For reasons of parsimony, we report the models without these control variables.

Path models

Cooperative coparenting

The path model for cooperative coparenting is presented in Figure 1. Higher levels of infant negative affectivity were related to more later child anxiety symptoms ($p = .006$). The hypotheses that infant negative affectivity would be related to less

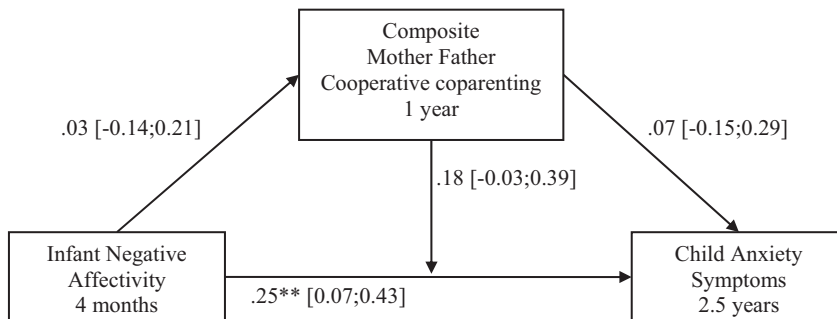


Figure 1 Path model examining the moderation of the composite score of mothers' and fathers' cooperative coparenting in the relation between infant negative affectivity and child anxiety symptoms. Estimates are standardized beta coefficients (95% confidence intervals are given between brackets). * $p < .05$; ** $p < .01$.

cooperative coparenting and that cooperative coparenting, in turn, would be related to less child anxiety symptoms, were not supported ($p = .528$ and $p = .716$, respectively). Also, cooperative coparenting did not moderate the association between child negative affectivity and child anxiety symptoms ($p = .088$).²

Divergent coparenting

In the second path model (Figure 2), higher levels of infant negative affectivity were related to more later child anxiety symptoms ($p < .001$). In this model, we found that more infant negative affectivity predicted less divergent coparenting of the type ‘mother cooperative – father neutral’ ($p = .006$). Infant negative affectivity was unrelated to divergent coparenting of the type ‘mother neutral – father cooperative’ ($p = .163$). We did not find main effects from ‘mother cooperative – father neutral’ and ‘mother neutral– father cooperative’ to later child anxiety symptoms ($p = .333$ and $p = .720$, respectively); however, we did find significant moderation effects.

We found that both divergent coparenting of the type ‘mother cooperative – father neutral’ and of the type ‘mother neutral– father cooperative’ moderated the association between negative affectivity and child anxiety symptoms ($p = .027$ and $p < .001$, respectively). Probing of the interaction with ‘mother cooperative – father neutral’ demonstrated that in families scoring 2 *SD* below the mean on this measure of divergent coparenting, negative affectivity, and child anxiety symptoms were unrelated ($\beta = -.11$, $p = .590$). In contrast, in families with average scores and scores 2 *SD*

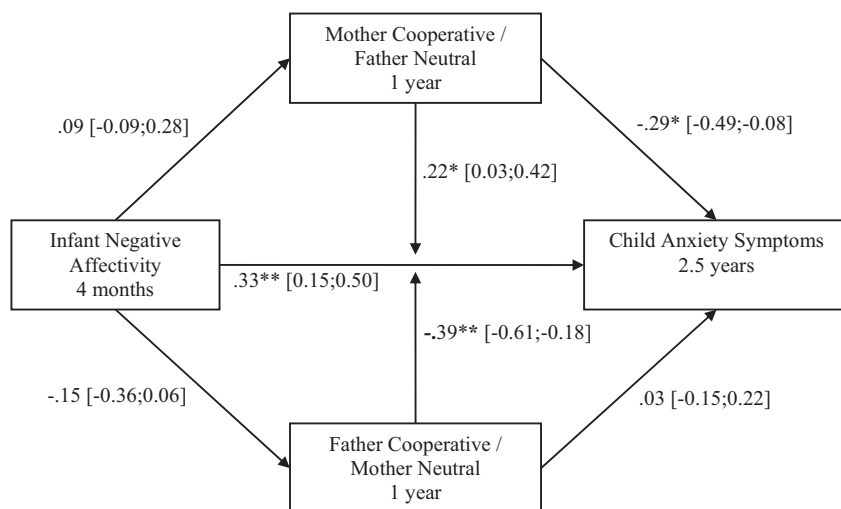


Figure 2 Path model examining the moderation of divergent coparenting behaviors (consisting of only mothers’ cooperative coparenting while father is neutral, and only fathers’ cooperative coparenting while mother is neutral) in the relation between negative affectivity and child anxiety symptoms. Estimates are standardized beta coefficients (95% confidence intervals are given between brackets). The composite score of mothers’ and fathers’ cooperation is accounted for in the statistical model, but is not displayed in the graphical representation. $*p < .05$; $^{**}p < .01$.

²Results for the model of simultaneous coparenting were highly similar to the results for the model of cooperative coparenting. For reasons of conciseness, these results are not displayed here.

above the mean on 'mother cooperative – father neutral', negative affectivity was related to more child anxiety symptoms, $\beta = .33$, $p < .001$, and $\beta = .77$, $p = .001$, respectively. Thus, in families with coparenting interaction patterns characterized by 'mother cooperative – father neutral', infant negative affectivity predicted more subsequent child anxiety than in families not characterized by this divergent coparenting.

Probing of the interaction with divergent coparenting characterized by 'mother neutral– father cooperative' demonstrated that for families with scores 2 *SDs* below the mean and average scores, negative affectivity was related to more child anxiety symptoms ($\beta = 1.11$, $p < .001$ and $\beta = .33$, $p < .001$, respectively). In contrast, in families with scores 2 *SDs* above the mean on 'mother neutral– father cooperative', negative affectivity was related to *less* child anxiety symptoms ($\beta = -.46$, $p = .041$). Thus, in families with divergent coparenting characterized by the pattern 'mother neutral- father cooperative', infant negative affectivity predicted less later child anxiety symptoms, while in families in which this pattern occurred less frequently, infant negative affectivity predicted more child anxiety symptoms.

DISCUSSION

The current study aimed to investigate whether coparenting predicts child anxiety and moderates the relationship between infant negative affectivity and child anxiety. Coparenting was conceptualized both as separate measures of maternal and paternal coparenting behaviors and as the dyadic simultaneity between fathers' and mothers' coparenting behaviors. The main results were: (1) infant negative affectivity at 4 months predicted later child anxiety symptoms at 2.5 years; (2) the extent to which mothers and fathers cooperated with each other while dressing up their 1-year-old infant was not significantly related to either earlier infant negative affectivity, or later child anxiety symptoms, and did not significantly moderate the relationship between negative affectivity and child anxiety; (3) simultaneous coparenting was not related to infant negative affectivity or child anxiety symptoms and did not moderate the relationship between negative affectivity and later child anxiety symptoms; (4) for both patterns of divergent coparenting, we found significant moderation effects: a higher occurrence of patterns characterized by mother cooperative while father was neutral predicted stronger associations between infant negative affectivity and child anxiety symptoms, whereas a higher occurrence of patterns characterized by mother neutral while father was cooperative predicted weaker associations between infant negative affectivity and child anxiety symptoms.

In line with previous studies (Fox et al., 2005; Hirshfeld et al., 1992), we found that parents' perceptions of infant negative affectivity at 4 months predicted perceptions of child anxiety symptoms in toddlerhood. Because of this relative stability from infant negative affectivity to later child anxiety, it is important to explore mechanisms that can serve to discontinue the relationship from early negative affectivity to later anxiety. This is especially true because early childhood anxiety poses a risk factor for later childhood anxiety disorders, as well as for the diagnosis of additional anxiety disorders, depression, and substance abuse (Beesdo-Baum & Knappe, 2012). Our results provide some evidence that coparenting is one of the mechanisms that may serve to discontinue the development from infant negative affectivity to child anxiety. Here it should be noted that both the measures of infant negative affectivity and of child

anxiety symptoms were assessed by parents' reports and should therefore be understood as parents' perceptions of their child's temperament and anxiety level.

Negative affectivity in infancy was not directly related to fathers' and mothers' individual coparenting behaviors, nor to simultaneous coparenting (i.e., mother and father cooperative at the same time), but it did predict less divergent coparenting. This may be explained by the fact that it is easier to parent a child who is low in negative affectivity than to parent a child high on negative affectivity (Davis et al., 2009; Laxman et al., 2013). That is, when children are relatively easy, parents may be more comfortable at handling the child on their own, thereby creating a pattern of taking turns (i.e., more divergent coparenting), rather than being involved in coparenting behaviors at the same time.

Unexpectedly, we did not find direct effects between coparenting and later child anxiety symptoms. However, given the small effect sizes found in a meta-analysis on the associations between coparenting and child outcomes (Teubert & Pinquart, 2010), our results are not surprising. To our knowledge, only one other study investigated whether coparenting predicts child anxiety. This study found that global observations of undermining coparenting in infancy predicted more teacher-reported child anxiety at 4 years (McHale & Rasmussen, 1998). Our study differed in several ways from that of McHale and Rasmussen (1998): the children's age (4 months to 2.5 years in our study, compared to 9 months to 4 years in their study); the measurement of coparenting (micro-level observations, compared to global observations); the task in which coparenting was assessed (a dress-up task, compared to a play task); and the measurement of child anxiety (parent ratings, compared to teacher-report). An explanation for the differences between the study results could be that global observational measures of coparenting, as used by McHale and Rasmussen (1998), relate differently to child anxiety than the micro-level coding that we used. Global ratings assign one score to the whole triad, whilst in our study, we attempted to investigate the interactive nature of mothers' and fathers' behaviors. Notably, McHale and Rasmussen (1998) only found significant associations of observed coparenting behaviors with teacher-reports of child anxiety, but not with parent-reports of child internalizing problems, which is consistent with our findings.

We found that coparenting patterns characterized by mothers' cooperation during fathers' neutral behavior increased the risk for infant negative affectivity to develop into later child anxiety symptoms, whereas coparenting patterns characterized by mothers' neutral behavior during fathers' cooperation decreased this risk. This result is in line with previous research on maternal gatekeeping, that is, maternal behaviors that inhibit a collaborative effort between men and women in family work (Allen & Hawkins, 1999). Studies have found that mothers who engage in gatekeeping behaviors create a sense of identity by dominating childcare. These mothers feel that childcare is their territory, which makes it difficult for them to share childcare with their partner (Dienhart, 2001; Mendez, Loker, Fefer, Wolgemuth, & Mann, 2015). Accordingly, maternal gatekeeping has been related to less father involvement with infants in triadic situations (Cannon, Schoppe-Sullivan, Mangelsdorf, Brown, & Szewczyk Sokolowski, 2008). Given the protective role of fathers' cooperative coparenting during mothers' neutral behavior, maternal gatekeeping may be an underlying risk factor for child anxiety that can explain our results, because these gatekeeping behaviors may prevent fathers from being cooperative coparents. In addition, our results strengthen our conclusion that it might be the turn taking between parents that functions as a protective

factor in the development of child anxiety. More specifically, it seems that the fact that father takes his turn (or is given the opportunity to take his turn) is particularly protective in this relationship, more so than when mother takes her turn.

The moderation effects for divergent coparenting also point to a specific role of the father in the development of child anxiety (Bögels & Phares, 2008). Our results suggest that when mothers leave opportunity for fathers to be active and cooperative, or fathers themselves initiate coparenting while mothers are neutral, this can protect children from developing anxiety symptoms over time. Fathers' lack of active involvement in childcare may serve as a risk factor also because fathers have been suggested to matter more in the development of anxiety than mothers (Bögels & Perotti, 2011; Bögels & Phares, 2008). According to Bögels and Perotti (2011), fathers are evolutionarily specialized in the external protection of the family (such as the approach of dangerous and unfamiliar situations or humans), whereas mothers are specialized in the internal protection of the family (such as comforting and nurturing). Accordingly, children have been found to interpret fathers' signals about threats as more salient than mothers' signals: 10- to 15-month-old infants expressed more anxiety in a visual cliff experiment when fathers gave anxious signals compared to mothers' anxious signals (Möller, Majdandžić, & Bögels, 2014). Being exposed to coparenting situations that are characterized by an interaction pattern in which fathers are cooperative while mothers are neutral may protect against child anxiety development, because the exposure to fathers' behaviors, initiatives, and ways of handling coparenting interactions and childcare may serve as a salient example for children in handling new and anxiety-provoking situations. It should be noted that the occurrence of divergent coparenting of the type where father is cooperative while mother is neutral was fairly low (<5%); hence, it appears that even rare behaviors can significantly predict child developmental outcomes. The finding that families with higher levels of simultaneous coparenting showed lower levels of divergent coparenting illustrates that families who display divergent behaviors are more diverse in the coparenting patterns they display. Thus, we suggest that those families in which divergent coparenting behaviors occur next to simultaneous behaviors are the families with protective characteristics when it comes to child anxiety.

In line with our finding that coparenting behaviors mainly function as a moderator rather than as a direct predictor of child anxiety symptoms, previous studies have also demonstrated that coparenting relates indirectly, rather than directly, to child temperament and later behavior problems (Kolak & Volling, 2013; Schoppe-Sullivan et al., 2009). This evidence for the moderating role of coparenting underlines Minuchin's (1974) idea of coparenting as the executive subsystem of the family that serves a guiding and organizing role in the family: child negative affectivity may be affected (or reorganized) by the coparenting dynamics, and the development of child anxiety may be explained through these indirect effects.

Our study had several strengths. To our knowledge, this study was the first to investigate simultaneity in coparenting. We found that dyadic measures of divergent coparenting especially add to the knowledge about how coparenting relates to child anxiety. The measures of fathers' and mothers' separate coparenting behaviors capture how mothers and fathers behave toward each other, but they do not capture how the family system behaves. In line with Gordon and Feldman (2008), we therefore conclude that observational measures at the micro-level can contribute to the study of coparenting and child outcomes. By using a longitudinal research design spanning the period from

infancy to toddlerhood, we demonstrated that coparenting plays a role in the development of child anxiety. In addition, we included parent reports of both fathers and mothers and included a clinical measure of child anxiety symptoms when children were 2.5 years old.

Several limitations of the current study should be taken into account when interpreting the results. First, changing clothes was used to observe coparenting. This is a parenting task that is usually performed by mothers (Geary, 2010). Results may be different for situations in which mothers' and fathers' involvement is more equally distributed, such as playing, because the impact of fathers' involvement may be more salient in typical maternal tasks such as clothes changing. Note however that the child was dressed up to look funny for a picture, which is not the typical maternal dressing situation, but rather exposing the baby to the outside world, which might be more a paternal role (Bögels & Phares, 2008; Paquette, 2004). Second, it is important to keep in mind that our sample consisted of highly educated families and children's levels of anxiety symptoms were subclinical. In samples with more risk factors (such as severe marital problems, severe parental psychopathology, or severe child psychopathology), simultaneous rather than divergent coparenting behaviors may be related to better child outcomes, because simultaneous behaviors may be rare and, therefore, more salient in an at-risk sample compared to our sample. Third, both infant negativity and child anxiety symptoms were reported by parents, which could be a confounding factor in the stability of infant negative affectivity into later anxiety. However, we aimed to minimize the disadvantages of parental report by averaging fathers' and mothers' ratings in order to compute a more reliable measure of child behaviors. In addition, it is likely that it is especially parents' perceptions of their child's behaviors that influence their coparenting, rather than 'objective' observational measures of temperament or anxiety.

Based on our findings, we suggest several avenues for future research. Given the relationships we found between coparenting and child anxiety, we suggest that future studies need to look further into both the risk and protective functions that coparenting behaviors can have in the development of child anxiety. Also, the differences between mothers' and fathers' coparenting behaviors should be investigated further. Future research should attempt to replicate our finding that mothers' coparenting behaviors serve as a risk factor, whereas fathers' coparenting behaviors serve as a protective factor in the development of child anxiety. In order to achieve this goal, research should not only focus on global, triadic measures of coparenting, but also consider separate measures of mothers' and fathers' behaviors and especially dyadic measures that capture characteristics of the family system rather than individual behaviors. Future research should look into the differences between mothers and fathers in order to replicate our findings and to investigate whether the found patterns of simultaneous and divergent coparenting are meaningful. Also, coparenting should be investigated in samples or in tasks in which the extreme coparenting behaviors of mutuality and competition may be expressed more often, since we were not able to capture these behaviors in the current study. It may be that these more extreme positive and negative coparenting behaviors carry additional explanatory value in the development of child anxiety.

Our results carry clinical implications. Treatment practices of child anxiety should take into account that the way parents interact together in the presence of their child, and not only the positive or negative content of their interactions, can influence

children's development of anxiety. Based on our results, clinicians may teach parents to let fathers engage more in coparenting; that is, being cooperative also when the mother is not cooperative at that moment. Also, clinicians' awareness of the possible detrimental effects of maternal gatekeeping may be important in the treatment of child anxiety (Cannon et al., 2008).

CONCLUSION

Coparenting is often referred to as the 'executive subsystem of the family'. Indeed, the way parents interact with each other in the presence of their child indirectly influences the development of child anxiety. When fathers are cooperative in coparenting interactions while mothers are neutral, this appears to protect highly negative infants from developing anxiety. Conversely, when mothers are cooperative while fathers are neutral, this seems to exacerbate the development from infant negative affectivity into later child anxiety. Fathers' cooperation, during mothers' neutral behavior, in the coparenting relationship therefore seems to be a protective factor in the development of child anxiety, whereas mothers' cooperation, during fathers' neutral behavior, may pose as a risk factor in the development of child anxiety.

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