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Fathers' challenging parenting behavior predicts less subsequent anxiety symptoms in early childhood

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ABSTRACT

Recent theories propose that (especially fathers') challenging parenting behavior (CPB) serves to reduce offspring's anxiety development, and that fearful children are more susceptible to parenting. Using a longitudinal design we explored whether more CPB (and less overprotection) of both parents, (1) separately, (2) relatively, and (3) jointly predicts less anxiety in early childhood, and (4) whether child fearful temperament moderates these relations. Participants were 132 couples with their first-born child. Child fearful temperament was observed at 4 months and 1 year, and parents' CPB and overprotection at 1 and 2.5 years. Child anxiety symptoms were assessed at 2.5 and 4.5 years. Multilevel analyses showed that more CPB and, unexpectedly, more overprotection predicted less child anxiety. Relatively, fathers' CPB and mothers' overprotection predicted less anxiety. An interaction showed that if one parent shows low CPB, the other parent's higher CPB predicts less child anxiety. A trend interaction suggested that fathers' CPB predicts less anxiety most strongly for fearful children. Thus, fathers' CPB appears to play a protective role in anxiety development, possibly in particular for children most vulnerable to develop anxiety problems. Parents can compensate for a less challenging partner. The finding that maternal overprotection mitigates child anxiety requires further investigation.

1. Introduction

Challenging parenting behavior (CPB) is a positive parenting dimension involving active physical and verbal behaviors that encourage children to push their limits, such as rough-and-tumble play, competitive games, and encouragement of assertiveness or performances (Majdandžić, De Vente, & Bögels, 2015). The construct of CPB has been developed based on theories on the role of the father in child development. Drawing attention to a potentially specific parenting role of fathers, Paquette (2004) postulated that the father-child relationship is characterized by CPB. Through physical and challenging play (i.e., CPB), this father-child "activation relationship" would serve to "open children to the outside world" (p. 198), that is, encourage and teach children to cope with social and other challenges. In line, based on evidence that mothers' engagement with their child is predominantly care-oriented and soothing, whereas fathers' engagement is predominantly play-oriented and exciting, Bögels and Phares (2008) argue that fathers' parenting role is different from mothers', where mothers' role would be to provide nurturance and care for the child, and fathers' role would be to foster the development of competition, autonomy and exploration. They propose that this paternal challenging role would, more so than mothers' protective role, prevent the development of anxiety.

The assumed difference in parenting roles between fathers and mothers is thought to have an evolutionary basis. Bögels and Perotti (2011) argue that in the course of human evolution, fathers specialized in 'external' protection (e.g., confronting the external world), while mothers specialized in 'internal' protection (e.g., providing comfort and food). According to the theory of Bögels and Perotti (2011), these evolved differential parental specializations make children instinctively more influenced by the information signaled by fathers' versus mothers' behavior with respect to potential threat. They argue that because of children's larger susceptibility to paternal signals, fathers' anxious parenting behavior (i.e., less challenging and more overprotective parenting) has a larger influence on anxiety development than mothers' parenting behavior. Both the (current) existence of specific paternal and maternal parenting roles, and their presumed evolutionary basis are controversial (discussed in Majdandžić et al., 2015). There is an ongoing debate about the question whether fathers and mothers have similar versus different parenting roles, also in contemporary Western

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societies. Recent publications on this issue illustrate that this debate is not yet solved (see Cabrera, Fitzgerald, Bradley, & Roggman, 2014; Majdandžić et al., 2015; Möller, Majdandžić, de Vente, & Bögels, 2013). Möller et al. (2013) review evidence in support of evolutionary based differences in parenting behavior in Western families, with fathers more inclined to show CPB, and mothers more inclined to show nurturance and care. Thus, according to theoretical models on fatherhood (Paquette, 2004), CPB may protect children against anxiety development (Bögels & Phares, 2008), and fathers' parenting behavior may have a larger influence on anxiety than mothers' (Bögels & Perotti, 2011).

Majdandžić et al. (2015) recently operationalized CPB using assessment via observations and parental reports. They defined it as "a collection of behaviors in which the parent excites, surprises, and momentarily destabilizes the child" (Majdandžić et al., 2015, p. 5). Their conceptual model of CPB is based on theories on fathers' role, proposing that (different from the mother-child "attachment relationship"), the father-child "activation relationship" is developed primarily through physical play (Paquette, 2004), and that fathers' CPB buffers against anxiety (Bögels & Phares, 2008). Studying CPB of both fathers and mothers, Majdandžić et al. (2015) provided support for the validity of CPB, the reliability and measurement convergence of questionnaire and observational measures of CPB, and stability of fathers' and mothers' CPB from infancy to toddlerhood. CPB appeared to be moderately negatively related to, but not opposite to, overprotection ($r = 0.03$ to -0.60 for observations and $r = -0.13$ to -0.48 for questionnaire measures; Majdandžić et al., 2015). Though conceptually related to autonomy granting, this parenting construct conveys more active encouragement of children to push their limits. The parent encourages the child (not necessarily intentionally) in a playful manner to exhibit risky behavior, or behavior that causes her to go outside of her comfort zone, while ensuring her safety and security. Although theoretical models stress the importance of fathers' physical play (Paquette, 2004), Majdandžić et al. (2015) included a socio-emotional component in CPB, and found strong associations between observed physical and verbal CPB. Factor analyses confirmed the convergence of physical (e.g., rough-and-tumble play), and socio-emotional (e.g., social daring, competition) subscales of parent-rated CPB into a single factor, as well as measurement invariance across fathers and mothers, at different child ages (Majdandžić et al., 2015, 2018). Thus, CPB can be performed both physically (e.g., rough-and-tumble play, chasing, tickling) and socio-emotionally (e.g., encouragement of climbing higher, encouragement of performing for an audience; Majdandžić et al., 2015).

Several recent empirical studies provide initial evidence of a buffering effect of CPB on child anxiety. In a longitudinal observation study, Majdandžić, De Vente, Möller, Bögels, and Van den Boom (2014) found that father's CPB decreases his four-year-old (but not his two-year-old) child's observed social anxiety half a year later. Mothers' CPB, in contrast, was found to increase this child's social anxiety. Similarly, in a questionnaire study, Möller, Majdandžić, and Bögels (2015) found a negative cross-sectional association between fathers' CPB and child fearful temperament in 10 to 15-months-old infants. Mothers' CPB was positively associated with child fearful temperament at trend-level. In two questionnaire studies with preschool-aged children, some of whom were clinically anxious, Lazarus et al. (2015), and Majdandžić et al. (2018), found that both mothers' and fathers' CPB was associated with lower maternal report of child anxiety symptoms. In contrast, Fliek, Daemen, Roelofs, and Muris (2015) found no significant association of fathers' and mothers' self-rated rough-and-tumble play and encouragement with preschoolers' anxiety symptoms. Thus, most of the available evidence reveals negative associations between fathers' CPB and child anxiety, whereas findings for mothers' CPB are mixed. This suggests that fathers' CPB is more consistently related to child anxiety than mothers' CPB, and provides initial support for the theoretical models proposing that fathers' CPB has a larger beneficial impact on child anxiety than mothers' CPB.

In contrast to the scarcity of studies investigating the potentially buffering effects of CPB on child anxiety, much research has addressed parenting behaviors that convey a risk. Of the parenting behaviors found to maintain and increase child anxiety, overprotection and overcontrol have been the most consistent (e.g., Buss & Kiel, 2013; Bögels & Brechman-Toussaint, 2006; Creswell, Murray, Stacey, & Cooper, 2011; Murray, Creswell, & Cooper, 2009). These parenting dimensions have been studied much more often in mothers than in fathers, and some theorists contend that overprotective parenting behaviors are more typical of mothers' parenting role (e.g., Bögels & Phares, 2008). Intended to decrease child distress in the face of new situations (but potentially with the opposite effect; Buss & Kiel, 2011), overprotection is reflected in behaviors that convey exaggerated worry or concern for the child's wellbeing and safety (Rubin, Coplan, & Bowker, 2009). Despite its potentially positive, warm (Rubin, Hastings, Stewart, Henderson, & Chen, 1997) form and intention, overprotection it is thought to maintain or increase anxiety by impeding the development of autonomy, restraining opportunities of gaining social experiences and skills, promoting perceptions of the environment as uncontrollable, and limiting the child's sense of personal competency or mastery (Buss & Kiel, 2013). Meta-analytic effect sizes for the relations between overprotection and related constructs with child anxiety range from $d = 0.25$ (McLeod, Wood, & Weisz, 2007) to $d = 0.58$ for studies using observational measures of overcontrol (Van der Bruggen, Stams, & Bögels, 2008), and appear to be small in early childhood, with $d = 0.12$ for maternal overprotection, and $d = 0.20$ for paternal overprotection in children up to 5 years (Möller, Nikolić, Majdandžić, & Bögels, 2016). Thus, relations of overprotection and related constructs with anxiety may increase with child age, in line with the meta-analysis of Van der Bruggen et al. (2008) who showed child age to be a significant moderator. Recent reviews recommend to break down the broader construct of overcontrol into subcomponents to examine their specific contributions to anxiety development (Creswell et al., 2011; McLeod et al., 2007; Murray et al., 2009). In early childhood, overprotection appears a meaningful parenting dimension to examine environmental influences on anxiety development (Buss & Kiel, 2013; Möller et al., 2016).

If relations between parenting behavior and child development are studied for both parents, they are often studied separately for fathers and mothers (e.g., Majdandžić et al., 2014; Verhoeven, Junger, van Aken, Deković, & van Aken, 2010). Other studies examine the relative impact of fathers' and mothers' parenting behaviors by including both as simultaneous predictors of child outcomes (e.g., Möller et al., 2015; Stolz, Barber, & Olsen, 2005). However, next to studying fathers' and mothers' unique and relative role in understanding parenting effects on child anxiety, an important and understudied perspective involves the joint effect of the father and the mother (Bögels & Perotti, 2011; Verhoeven et al., 2010). Although it has been proposed that fathers may be in a better position to be the challenging parent than mothers, and thus have a comparative advantage specifically regarding challenging their child (Bögels & Perotti, 2011), mothers may be able to compensate for a less challenging father by showing more CPB. It is therefore important to study not only separate and relative influences of fathers' and mothers' parenting behaviors in child anxiety, but also joint influences of fathers' and mothers' parenting behavior in terms of moderation.

An important endogenous vulnerability factor in anxiety development is child fearful temperament (Creswell et al., 2011; Murray et al., 2009). One manifestation of this predisposition is behavioral inhibition, the tendency to respond withdrawn and anxious to unfamiliar social and non-social situations (Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Rubin et al., 2009). Negative reactivity in early infancy has been identified as a precursor of behavioral inhibition (Kagan & Snidman, 1999). Children with a fearful temperament may be more susceptible to parenting, because they look more at parental signals to understand whether novel stimuli represent opportunities or threat (i.e., social referencing; Aktar, Majdandžić, de Vente, & Bögels, 2013). Indeed,

measures of fearful temperament, such as behavioral inhibition and negative reactivity, stand out as a major behavioral indicator of differential susceptibility; the notion that individuals vary in their susceptibility to not only negative, but also positive environmental influences (Bakermans-Kranenburg & van IJzendoorn, 2015; Belsky & Pluess, 2009; Ellis & Boyce, 2011). The two sides (susceptibility to negative versus positive influences) of the differential susceptibility hypothesis may also occur independently (but see Bakermans-Kranenburg & van IJzendoorn, 2015, for a critical note on this issue). Where diathesis-stress models propose that vulnerable individuals are more likely to develop psychopathology in the face of adversity, the notion of vantage sensitivity conveys that individuals with certain traits (notably, a fearful temperament) are more likely to obtain positive outcomes in the face of positive environmental influences (Pluess & Belsky, 2013).

The increased sensitivity for external stimuli in highly susceptible children is thought to reflect an underlying heightened sensitivity of the nervous system, including the amygdala (Pluess & Belsky, 2013). This is indeed characteristic of behavioral inhibition (Fox et al., 2005), and may reflect an early stable underlying propensity. Thus, a fearful temperament in infancy may act as an indicator of differential susceptibility, conveying susceptibility to positive and negative influences, or may convey either vulnerability or vantage sensitivity. While overprotection can be considered a negative parenting influence because of the established links with anxiety development (Buss & Kiel, 2013; Creswell et al., 2011; McLeod et al., 2007; Van der Bruggen et al., 2008), CPB, with its playful, encouraging manifestation, can be seen as a positive environmental influence. Indeed, Majdandžić et al. (2015) found predominantly positive associations between CPB and warmth across measurement instruments and child ages (with $r = 0.03$ to 0.39 for observations and $r = 0.26$ to 0.46 for questionnaire measures). As discussed above, recent studies also provide evidence for a buffering effect of CPB (Majdandžić et al., 2018, 2014; Möller et al., 2015). Thus, children with a fearful temperament may be more vulnerable to the negative effects of overprotection, and/or more sensitive to the positive effects of CPB.

The aim of the current study was to shed more light on the role of the father versus the mother in the development and overcoming of anxiety in their offspring, looking at behaviors that are thought to be more typical of fathers, next to traditionally studied 'maternal' parenting behaviors. We tested whether parents' higher challenging and lower overprotective parenting behavior predict less subsequent anxiety symptoms in young children, and whether this effect is stronger for fathers than for mothers. We used a longitudinal observation design, exploring the effects of fathers' and mothers' parenting behaviors on child anxiety from infancy to early preschool age. This design allowed us to test: 1) the direct effect of fathers' parenting behavior, and of mothers' parenting behavior (separately); 2) the relative effects of fathers' and mothers' parenting behavior, that is, whether the father is more important than the mother; 3) the joint (interactive) effect of fathers' and mothers' parenting behavior, that is, whether parents can buffer each other's parenting effect; for example, to what extent can a challenging mother compensate for the lack of challenging of the father, and vice versa? In addition, infant fearful temperament was studied as a moderator of these relations to examine whether children with a fearful temperament benefit most from CPB (reflecting vantage sensitivity), suffer most from overprotection (reflecting vulnerability), or both (reflecting differential susceptibility).

2. Methods

2.1. Participants

Participants who started the study were 151 couples and their infants, who participated in the ongoing longitudinal study (The Social Development of Children), on the antecedents of anxiety in young children (Aktar et al., 2013; Majdandžić et al., 2015). The study was conducted in the Netherlands. Couples who were expecting their first child were recruited through leaflets provided by midwives in (Amsterdam) and in cities within a range of 50 kilometers around it, at pregnancy courses, and at baby shops, and through advertisements in magazines and on websites on parenthood. All couples where cohabiting at the first postnatal measurement.

Of the 151 families who started participation in the study at the prenatal measurement, 14 families dropped out before the first postnatal measurement because they found participation with their young baby too time consuming. Sample size dropped to 120 families at the fourth postnatal measurement at 4.5 years. Dropping out was mainly due to parents finding participation too time consuming or having moved out of the area. Data for the current study were available for 132 families (73 with a girl, 59 with a boy). Mean age of the children was: $M = 4.19$ months, $SD = 0.36$ at the first postnatal measurement (Time 1; 4 months), $M = 12.58$ months, $SD = 0.75$ at the second (Time 2; 1 year), $M = 30.54$ months, $SD = 0.63$ at the third (Time 3; 2.5 years), and $M = 54.71$ months, $SD = 0.67$ at the fourth (Time 4; 4.5 years).

After completing a measurement, families received a 20 euro gift voucher, and (at the postnatal measurements) a small present for the child and a DVD of the laboratory sessions. The Department of Psychology's ethical approval was obtained and all participants provided written informed consent. Couples were included if they had adequate command of the Dutch or English language, and if their baby had no neurological deficits, a birth weight above 2500 g, and an Apgar score above 7.

The vast majority of parents was of Dutch origin (89% of mother, 95% of fathers). Educational level was fairly high; for mothers, $M = 7.05$, $SD = 1.11$, range 1–8 (on a scale from 1: *primary education*, to 8: *university*); for fathers: $M = 6.57$, $SD = 1.59$, range 2–8. Mothers' professional level was $M = 8.70$, $SD = 2.11$ (range 2–11), fathers': $M = 8.22$, $SD = 2.66$ (range 3–11), on a scale ranging from 1 (*manual labor for which no education is required*) to 11 (*labor for which a university degree is required*). Thus, socioeconomic status of the parents was relatively high. Mothers' mean age at Time 1 was 31.89 years, $SD = 4.19$, and fathers' mean age was 34.82 years, $SD = 5.41$.

2.2. Procedure

At all measurement occasions, mothers and fathers visited the (Research Center for Parent and Child) separately with their child, and home visits were conducted. During these visits various observational tasks were conducted to assess, among other variables, child temperament, anxiety, and parenting. Two weeks before the laboratory visits, a set of questionnaires was sent to the parents to be completed individually and returned at the lab visit. During the lab visits, parents received a second set of questionnaires to be filled out at home individually.

2.3. Measures

2.3.1. Observed parenting behavior

2.3.1.1. Procedure. The current study uses the data on parenting behavior when the child was 1 year and 2.5 years old. In view of space, the procedure and observational tasks are described only briefly here; details can be found in Majdandžić et al. (2015). All observational tasks were conducted by a female experimenter and videotaped (lab: using three cameras controlled from behind a one-way screen; home visit: using a hand held camera). Fathers and mothers were observed separately, except for certain tasks during the home visit. Parents were instructed to play with their child as usual (free play tasks), or to perform the structured tasks as instructed. The majority of these tasks were specifically designed to assess CPB and overprotection.

At Time 2 (child age 1 year), parenting behavior was measured using 10 tasks. Three were conducted during the laboratory visits: 1) a

5 min free play task with a box containing toys; 2) a 5 min free play task without toys on a mat with cushions (shoes were off); 3) a dancing task in which the parent danced with the child on a three min. song. Seven tasks were conducted during the home visit: 4) a 5 min free play task without toys on a location by choice (usually the couch); three movement tasks, in which the parent (alone) 5) grabbed the child's (lying on her back) ankles and wrists, lifted her up and swung her; 6) held the child against his/her body and let her fall face down towards the mat on the table while catching her in time; 7) picked the child up and let her "fly", while holding her; three tasks with both parents, in which 8) each of the parents played horse (hands and knees on the floor) with the child on his/her back, while the other parent was holding her; 9) the parents each in turn put the child on the neck of the other parent; and 10) the parents swung the child in a blanket.

At Time 3 (child age 2.5 years), 12 tasks were conducted to assess parenting behavior; seven during the laboratory visits: three movement tasks, in which the parent 1) put the child on an oval space hopper (an oval 55 cm high inflatable ball) and let her "ride horse"; 2) let the child role over the space hopper twice; 3) picked the child up and let her "fly", while holding her. 4) A 5 min free play task without toys on a mat (shoes off) with cushions and a large beanbag; 5) a 5 min free play task on the mat with toys; 6) a 3 min toy cleanup task; 7) a 10 min risk room, consisting of parent-child play with several challenging toys (such as a trampoline, a rocking horse, a hairy lion mask, stepping stones, a black box with eyes and teeth, a play tunnel). Five tasks were conducted during the home visit; three with each parent alone: 8) a 5 min free play task with toys present in the house; 9) a toy cleanup task; 10) a 5 min free play task without toys; and two tasks with both parents, in which: 11) each parent in turn put the child on the other parent's back (standing); 12) the parents swung the child in a blanket.

2.3.1.2. Coding. Challenging parenting behavior and overprotection were coded in all tasks. In the free play tasks, the cleanup tasks and risk room, several other parenting dimensions were also coded but these were not used in the current study. The observational measures (tasks and coding) of CPB and overprotection were specifically designed to assess these constructs in parents of young children. The validity and reliability of these measures has been established (Majdandžić et al., 2015). Coding is described briefly here, details and psychometric data are in Majdandžić et al. (2015). Psychometric properties regarding internal consistency, stability, convergence with questionnaire measures and divergent validity were good for CPB and sufficient for overprotection. For coding, the tasks were divided into small coding intervals (mostly 30 s or 1 min). In every coding interval, CPB and overprotection were each rated on a 5-point scale. The way of rating was based on the Meso Behavioral Rating System for Families with young children (Mahoney, Coffield, Lewis, & Lashley, 1998), where lower scores (1 and 2) denote a low frequency and/or intensity of the observed behavior, 3 an intermediate frequency and intensity, and higher scores (4 and 5) a high frequency and/or intensity. Thus, CPB and overprotection were coded on a 5-point scale in each coding interval of each task, subsequently (per task) averaged across coding intervals, and, finally, the tasks were averaged into final measures of CPB and overprotection for the father and for the mother (see below).

CPB reflected the extent to which the parent socio-emotionally and physically encouraged the child in a playful manner to exhibit risky behavior, or behavior that causes the child to go outside of his/her comfort-zone. Examples include 'chasing' the baby with a hand puppet, striking the child with a pillow, dancing wildly with the baby, wildly hopping the child on the space hopper, throwing the baby in the air, swinging the child in the blanket with high speed and height, chasing the child with growling noises or "I am going to catch you!", tickling, rough-and-tumble play, making tension increasing sounds ("Woohiii!"), or verbally challenging the child to push her limits (e.g., "Show me that you can do that!").

Overprotection reflected the extent to which the parent conveyed exaggerated worry or concern for the child's wellbeing and safety. Examples include holding the child firmly during climbing or hopping on the space hopper, comforting the child while not or barely crying, handling the child very carefully while gently flying or dancing, holding the child's hand when on the stepping stones without the child requesting it, making remarks about safety (e.g., "Not too fast.", "Careful!", "Hold tight!", "That mask is scary, he?"), possibly accompanied by tension in the parent.

Coding at each measurement occasion was done by different groups of (female) observers (n = 8 per measurement occasion), trained by the first author (the master coder). All observers coded fathers as well as mothers, but did not code two parents of the same child (except for inter-observer reliability). In the handling tasks with both parents, each parent's behavior was separately coded. Coding started after an intensive training period, and during coding regular meetings were held for calibration and discussion of coding issues. At Time 2, 15% of the parents were also coded by the master coder; at Time 3, 21% of the parents was coded by all observers. Inter-observer reliability was based on the aggregated constructs CPB and overprotection (mean across tasks), using the intraclass correlation (ICC). Inter-observer reliability of CPB and overprotection was acceptable to high (see *Masked reference*). At Time 2 the ICC was calculated for each of the four groups of observers. *M* ICC across groups = .93 (*SD* = .04, range = .80 to .97) for CPB, and *M* ICC = .77 (*SD* = .11, range = .67 to .90) for overprotection. At Time 3, the ICC was calculated separately for the observers coding the home and lab visit tasks. CPB: ICC = .83 for home visit, and .92 for lab visit. Overprotection: ICC = .68 for home visit, and .78 for lab visit.

One task at 1 year (task 9 described above) and two tasks at 2.5 years (6 and 9) appeared not suitable to assess overprotection because of low occurrence of overprotective behavior and were not included in overprotection (see Majdandžić et al., 2015). The remaining tasks were averaged to obtain a robust and generalizable measure of mothers' and fathers' CPB and overprotection: 10 for CPB and 9 for overprotection at 1 year, and 12 for CPB and 10 for overprotection at 2.5 years. Because context-specificity is typical in observations of behavior in different contexts, standards for coherence across observational contexts are not comparable with for example internal consistency of questionnaires. Internal consistency across these tasks was acceptable to high, given the different tasks and settings (lab and home) in which parenting was observed (Cronbach's alpha ranged from .69 to .80 for CPB, and from .43 to .76 for overprotection).

2.3.2. Child fearful temperament

2.3.2.1. Procedure and coding at 4 months. At child age 4 months (Time 1), negative reactivity was assessed using the paradigm of Kagan and Snidman (1991). Infants' reactions to three non-social stimuli (visual, auditory, and olfactory) were observed, and a new social stimulus was developed (see Aktar, Colonnesi, de Vente, Majdandžić, & Bögels, 2017). At the start of the task, the infant was placed in a baby bouncer on a table, and the parent sat on a chair behind the infant, while the experimenter conducted the tasks. The visual stimuli were three mobiles with hanging balls with flashing lights, each presented twice in increasing intensity (with one, three and seven balls) in six consecutive trials of 20-sec intervals with 10-sec breaks between trials. The olfactory stimuli were distilled water, water with a low (0.001%), and high (0.002%) concentration of butanol, each presented twice in increasing intensity in 6 trials of 5 s, with 5-sec breaks between trials. In each trial, the experimenter held a q-tip with the olfactory stimulus 3 cm away from the child's nose for 5 s. The auditory stimuli were three tones of increasing intensity (55 (±) dB, the 65 (±) dB and 75 (±) dB), each presented twice in 6 consecutive trials of 10-sec intervals, with 10-sec breaks between trials. The social stimulus was a male stranger who gradually approached the infant while greeting her and picked her up from the chair (4 intervals lasting 5–15 s each; see Aktar et al., 2017).

In each time interval in each task, the following emotional infant behaviors were coded: intensity of negative facial expression (e.g., frowning, a fearful/crying face), intensity of protest (e.g., whining, fussing), and duration of crying. In addition, two motor behaviors were coded: intensity of motor activity and amount of arching. These behaviors were averaged across time intervals, standardized, and aggregated to obtain an emotional reactivity and a motor activity score for each task. These scores were averaged across the four tasks to obtain an infant negative reactivity score. Internal consistency across these 8 scores (4 tasks * 2 behavior scores) was Cronbach's alpha = .56.

Coding was done by two trained observers. To test inter-observer reliability, 19% of the infants were coded by both observers. Inter-observer reliability (ICC) for the total negative reactivity score was .85 (.89 for the emotional reactivity score, and .72 for the motor activity score).

2.3.2.2. Procedure and coding at 1 year. At 1 year, child fearful temperament was assessed using 11 tasks from several well-known standard laboratory instruments to assess behavioral inhibition (see Aktar et al., 2013). All tasks were conducted by a female experimenter, and the parent was sitting behind the child and instructed to remain neutral (except if the child's reaction necessitated soothing). Three tasks were from the Laboratory Temperament Assessment Battery (LAB-TAB; Goldsmith & Rothbart, 1996): Unpredictable mechanical toy (a large, remote controlled toy train drove across the table towards the child three times), Stranger approach (a male stranger talked to, approached and picked up the child who was seated in a high chair), and Masks (the experimenter appeared from behind a curtain successively showing three masks; a grandmother, a tiger, and a black robot). Four discomfort tasks developed by Kochanska, Coy, Tjebkes, and Husarek (1998) were used: Ice (an ice cube was held against the foot and the neck of the child), Lemon (the child was twice given a spoon of diluted lemon juice), Spray (water was sprayed on the child's face once), and Blender (the child was exposed to the noise of a blender for 30 s). In the Truck task (Calkins, Fox, & Marshall, 1996; Fox, Henderson, Rubin, Calkins, & Schmidt, 2001), a female stranger came into the room, played with a toy truck with blocks, and invited the child to join. Three unpredictable mechanical toy tasks were conducted at the home visit, modelled after Rothbart (1988): Buzzing animal (a small vibrating animal toy was placed within arm's reach distance of the child), Ambulance (a toy ambulance with light and sound rode towards the child), and Horse (a neighing toy horse approached the child).

In each task, the following child behaviors were coded across time intervals (see Goldsmith & Rothbart, 1996): latency to first fear response (except in Truck and the home visit tasks), intensity of facial fear, intensity of bodily fear, intensity of escape, and intensity of distress vocalizations. In addition, several task-specific behaviors were coded (e.g., latency to touch toy in relevant tasks; gaze aversion in Stranger Approach; distance to the stranger in Truck). The scores were averaged across coding intervals, then standardized and averaged for each task. Six observers were trained by a master coder (MM) to code the 11 tasks. To establish inter-observer reliability, the master coder coded 20% of each observer's data pool. Average inter-observer reliability (ICC) of coded variables across tasks was good: .82 (*SD* = .11; range .61–.98).

Internal consistency across child behaviors for each task was good: Unpredictable mechanical toy: Cronbach's alpha = .87; Stranger approach: .74; Masks: .91; Ice: .70; Lemon: .70; Spray: .85; Blender: .79; Truck: .81; Buzzing animal: .82; Ambulance: .80; Horse: .90. The 11 scores were aggregated into a score for child fearful temperament; internal consistency across tasks was .79.

2.3.3. Child anxiety symptoms

The level of child anxiety symptoms at 2.5 and 4.5 years was measured using fathers and mothers' ratings on the Preschool Anxiety Scale-Revised (PAS-R; Edwards, Rapee, Kennedy, & Spence, 2010). This questionnaire contains 30 items assessing five scales: social anxiety (7 items; e.g., "My child worries that he/she will do something to look stupid in front of other people"), separation anxiety (5 items; e.g., "My child becomes distressed if separated from his/her parents"), generalized anxiety (7 items; e.g., "My child has difficulty stopping him/herself from worrying"), specific fears (9 items; e.g., "My child is frightened of dogs"), and obsessive–compulsive symptoms (OC; 2 items; e.g., "My child becomes distressed by thoughts or images in his/her head"). Parents respond to the items using a five-point Likert scale (from 1 = not at all true, to 5 = very often true). A total score for maternal-rated and paternal-rated child anxiety symptoms was obtained by averaging all items, without the two OC items (Edwards et al., 2010). Although the PAS-R is intended for use from 3 to 5 years, its predecessor the PAS has been validated in 2-year-olds (Broeren & Muris, 2008), and psychometric properties at 2.5 years in the current sample were as good as at 4.5 years. Internal consistency of these scales was high: at 2.5 years: Cronbach's alpha = .89 for mothers and .92 for fathers; at 4.5 years: .88 for mothers and .92 for fathers. At each measurement occasion, fathers' and mothers' ratings ($r = .45$, $p < .001$, $r = .42$, $p < .001$, respectively) were averaged to obtain an index of child anxiety symptoms at 2.5 and at 4.5 years.

2.4. Analytic approach

To account for the hierarchical structure of the data, a multilevel model was specified with measurement occasions (two time points; level 1) nested within families (level 2). Nesting was done across the two time points because each of the variables was measured twice: parenting behavior at 1 and 2.5 years, child anxiety symptoms at 2.5 and 4.5 years, and child fearful temperament at 4 months and 1 year. The resulting multilevel model takes into account the dependency of the data (time points within families) resulting in increased power. Because nesting was across two time points, fixed effects multilevel regression models were run. Fathers' and mothers' parenting behaviors (at 1 year and 2.5 years) were used to predict child anxiety symptoms (at 2.5 and 4.5 years), and moderation by child fearful temperament (at 4 months and 1 year) was tested. All continuous variables were standardized across the grand mean. Maximum likelihood was used as the method of estimation. Separate models were run for CPB and overprotection as predictors of child anxiety.

First, we investigated the main effects of parenting behavior on child anxiety symptoms in early childhood in a series of multilevel models testing 1) the direct effect of parenting behavior of the father and of the mother in separate models; 2) the relative effect of fathers' and mothers' parenting behavior as two simultaneous predictors in one model; 3) the joint effect of parents' behavior by modeling the interaction between fathers' and mothers' parenting behavior. Second, we tested the moderating effect of child fearful temperament on the association between parenting behavior and subsequent child anxiety symptoms. Significant interactions were probed and plotted, and simple slopes and regions of significance (Johnson-Neyman technique) were obtained to interpret the results, as described by Preacher, Curran, and Bauer (2006).

Thus, for challenging parenting behavior, and for overprotection, six multilevel models were tested, all predicting subsequent child anxiety symptoms: 1) fathers' parenting behavior as single direct predictor; 2) mothers' parenting behavior as single direct predictor; 3) fathers' and mothers' parenting behaviors as simultaneous (relative) predictors; 4) the interaction between fathers' and mothers' parenting behaviors as joint predictors; 5) the interaction between fathers' parenting behaviors and child fearful temperament; 6) the interaction between mothers' parenting behaviors and child fearful temperament.

No control variables were included in the models, because the sample was relatively homogeneous on SES, the children had similar age, and there were no differences between boys and girls on the study variables.

Table 1
Descriptives and correlation matrix of all study variables.

	M (*SD*)		1	2	3	4	5	6	7	8
	mother	father								
1. Child fearful temp. at 4 mo	0.00 (0.38)		–	.03	.00	.08	−.01	.05	−.06	−.11
2. Child fearful temp. at 1 y	−0.01 (0.39)		.03	–	−.03	−.01	.20*	.00	.19*	.15
3. Parental CPB at 1 year	2.36 (0.39)	2.42 (0.47)	.15	−.11	.39***	.47***	−.55***	−.20*	−.04	−.03
4. Parental CPB at 2.5 years	1.89 (0.25)	1.92 (0.28)	.10	−.18*	.65***	.27**	−.16+	.03	.01	−.12
5. Parental overprotection at 1 y	1.67 (0.35)	1.53 (0.31)	−.22*	.07	−.39***	−.29**	.31**	.12	.01	−.04
6. Parental overprotection at 2.5 y	1.41 (0.13)	1.37 (0.13)	−.08	−.15	−.13	−.05	.04	.04	.05	−.04
7. Child anxiety symptoms at 2.5 y	1.75 (0.40)		−.06	.19*	.05	.02	−.05	.05	–	.65***
8. Child anxiety symptoms at 4.5 y	1.96 (0.45)		−.11	.15	−.09	−.11	.12	−.00	.65***	–

Note. Correlations below the diagonal are for mothers, above the diagonal for fathers, on the diagonal between fathers and mothers (where applicable). Temp. = temperament, CPB = challenging parenting behavior.
***$p < .001$. **$p < .01$. *$p < .05$. $^{+}p < .10$.

3. Results

3.1. Preliminary analyses

Two sets of drop out analyses were conducted. First, we explored whether the families that dropped out after the prenatal measurement ($n = 12$, 8%) differed on demographic variables. Families that dropped out were lower educated: mothers: $t(143) = 2.54$, $p = .012$, fathers: $t(147) = 2.43$, $p = .016$, and mothers had lower professional level $t(148) = 2.38$, $p = .019$. Second, we explored whether the 22 (18%) families that dropped out between Time 1 (4 months) and Time 4 (4.5 years) differed on demographic variables, on child fearful temperament and on parenting behavior. They did not differ on any of the study variables (all $p > .05$), except that fathers of these families were lower on overprotection at 1 year: $t(122) = 2.31$, $p = .022$, and higher on CPB at 2.5 years: $t(118) = -2.14$, $p = .034$.

All final measures were checked for univariate outliers, using $z < -3.29$ or $z > 3.29$ as the criterion, which were truncated to a value near the first non-outlier (Tabachnick & Fidell, 2001). Skewness and kurtosis was $< |2|$ for all measures.

Correlations between all study variables are presented in Table 1. As regards the criteria for testing differential susceptibility (Belsky, Bakermans-Kranenburg, & van IJzendoorn, 2007), the susceptibility factor (moderator; i.e., child fearful temperament) should be unrelated to the environmental factor (i.e., parenting behavior), and to the outcome (i.e., child anxiety symptoms). In line with these criteria, the correlation matrix shows few significant relations between child fearful temperament and fathers' and mothers' overprotection and CPB at 1 year and at 2.5 years (Table 1); fearful temperament at 4 months showed an unexpected significant negative correlation to mothers' overprotection at 1 year ($r = -.22$), and fearful temperament at 1 year was correlated significantly negatively to mothers CPB at 2.5 years ($r = -.18$), and positively to fathers' overprotection at 1 year ($r = .20$). Unexpectedly, child fearful temperament was unrelated to child anxiety symptoms at 2.5 years and at 4.5 years, except for a significant correlation between fearful temperament at 1 year and anxiety symptoms at 2.5 years ($r = .19$). Thus, the low number and modest size of these correlations indicate that the requirements for the testing of differential susceptibility were largely met. Table 1 further shows that parental overprotection and CPB were unrelated to child anxiety symptoms.

3.2. Predictive relations between challenging parenting behavior and child anxiety symptoms

The first direct-effects multilevel model revealed that fathers' CPB predicted less child anxiety symptoms in early childhood; $\beta = -.24$, $t(149) = -4.56$, $p < .001$. The next model showed that mothers' CPB also predicted less child anxiety symptoms; $\beta = -.21$, $t(155) = -3.95$, $p < .001$. Second, the relative-effects model revealed that, when simultaneous as two predictors in one model, fathers' CPB significantly predicted less child anxiety symptoms; $\beta = -.19$, $t(183) = -2.79$, $p = .006$, whereas mothers' CPB did not; $\beta = -.08$, $t(183) = -1.19$, $p = .235$. Thus, the relative contribution of fathers' CPB to child anxiety symptoms seems to be larger than that of mothers. Third, the joint-effects model revealed a significant interaction ($\beta = .10$, $t(131) = 2.14$, $p = .034$) between fathers' and mothers' CPB on child anxiety symptoms. All models are presented in Table 2.

The interaction was probed using simple slopes, and by plotting mothers' CPB against child anxiety symptoms for different levels of fathers' CPB (Fig. 1). For children with a father high (1 *SD* above the mean) in CPB, mothers' CPB did not significantly predict subsequent anxiety symptoms ($\beta = -.01$, $p = .935$). For children with a father low (1 *SD* below the mean) in CPB, mothers' CPB predicted less subsequent anxiety symptoms ($\beta = -.20$, $p = .022$). The region of significance

Table 2
Results of the Multilevel Regression Models of Challenging Parenting Behavior predicting Child Anxiety Symptoms.

	Direct		Relative	Joint	Interaction with fearful temp.	
	Father	Mother			Father	Mother
	β	β	β	β	β	β
Fathers' CPB	−.24***		−.19**	−.21**	−.26***	
Mothers' CPB		−.21***	−.08	−.11		−.21***
Fathers' × mothers' CPB				.10*		
Child fearful temperament					.04	.06
Fearful temperament × fathers' CPB					$-.10^{+}$	
Fearful temperament × mothers' CPB						.00

Note. Direct: Separate models for mothers' and fathers' CPB. Relative: Fathers' and mothers' CPB are entered as simultaneous predictors. Joint: The interaction between fathers' and mothers' CPB is tested. Temp. = temperament. Interaction with temperament model: Separate models for mothers' and fathers' CPB.
***$p < .001$. **$p < .01$. *$p < .05$. $^{+}p < .10$.

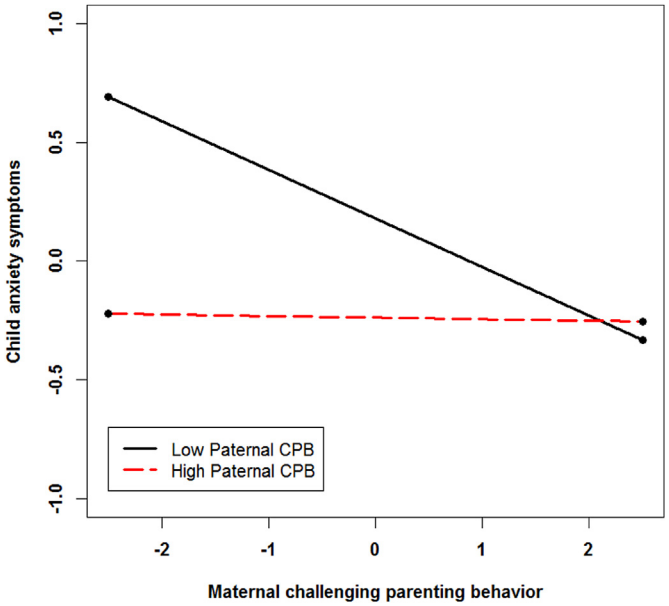

Fig. 1. Simple slopes plot of the relation between mothers' CPB (standardized) and child anxiety symptoms (standardized) for different values of fathers' CPB. For children with a father high in CPB (1 *SD* above the mean), the relation is non-significant ($\beta = -.01$, $p = .935$); For children with a father low in CPB (1 *SD* below the mean), the relation is significantly negative ($\beta = -.20$, $p = .022$). CPB = challenging parenting behavior.

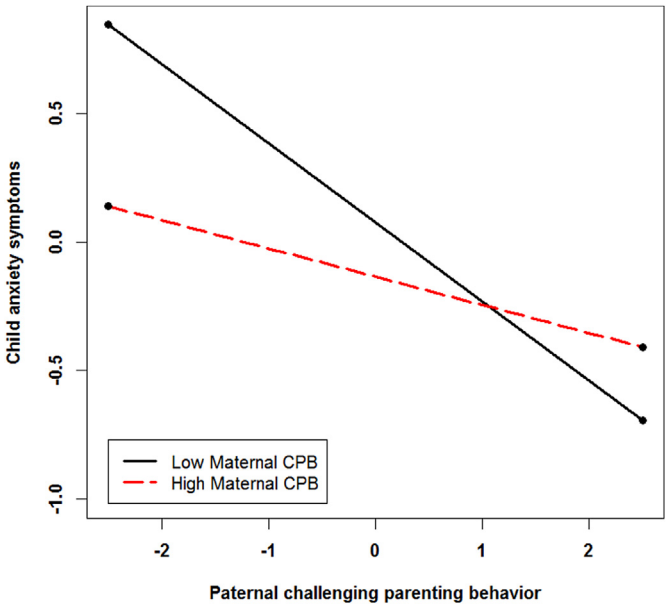

Fig. 2. Simple slopes plot of the same interaction as in Fig. 1, now presenting the relation between fathers' CPB (standardized) and child anxiety symptoms (standardized) for different values of mothers' CPB. For children with a mother high in CPB (1 *SD* above the mean), the relation is non-significant ($\beta = -.11$, $p = .145$); For children with a mother low in CPB (1 *SD* below the mean), the relation is significantly negative ($\beta = -.30$, $p < .001$).

(Preacher et al., 2006) revealed that the association between mothers' CPB and child anxiety symptoms becomes significantly negative for children with a father displaying a level of CPB < 0.40 *SD* below the mean. The interaction was also probed in a reversed way (Fig. 2). As can be seen in Fig. 2, a highly challenging father can also compensate for a low challenging mother. For children with a mother high in CPB (1 SD above the mean), fathers' CPB did not significantly predict anxiety symptoms ($\beta = -.11$, $p = .145$); For children with a mother low in CPB

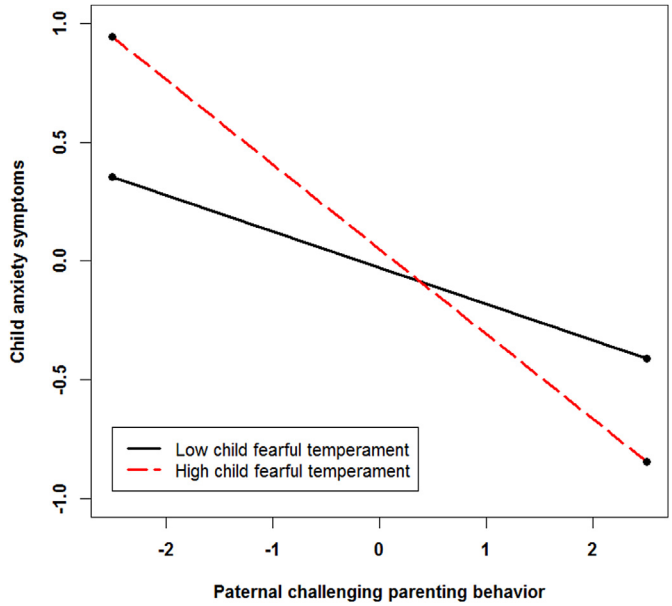

Fig. 3. Simple slopes plot of the relation between fathers' CPB (standardized) and child anxiety symptoms (standardized) for different values of child fearful temperament. For children low on fearful temperament (1 *SD* below the mean), the relation is significantly negative ($\beta = -.15$, $p = .032$); For children high on fearful temperament (1 *SD* above the mean), the relation is also significantly negative, with a steeper slope ($\beta = -.36$, $p < .001$).

(1 SD below the mean), fathers' CPB predicted less subsequent anxiety symptoms ($\beta = -.30$, $p < .001$). The association between fathers' CPB and child anxiety symptoms becomes significantly negative for children with a mother displaying a level of CPB < 0.72 *SD* above the mean. Thus, one parents' high CPB seems to compensate for low CPB of the other parent; in families with a low-challenging father or mother, high CPB of the other parent predicts less anxiety symptoms.

3.3. Fearful temperament as a moderator of the relation between challenging parenting behavior and child anxiety symptoms

Next, to examine whether infants at risk for anxiety would benefit specifically from CPB, we tested whether child fearful temperament moderates the relation between fathers' and mothers' CPB and child anxiety symptoms. The interaction between child fearful temperament and fathers' CPB was marginally significant ($\beta = -.10$, $t(145) = -1.75$, $p = .082$; Table 2). Given challenges to detecting interaction effects in non-experimental research (McClelland & Judd, 1993), and because interaction effects require a larger power, and in order to reduce Type II error, this trend-level interaction was probed (Fig. 3). For children low (1 *SD* below the mean) in fearful temperament, fathers' CPB predicted significantly less subsequent anxiety symptoms ($\beta = -.15$, $p = .032$). For children high (1 *SD* above the mean) in fearful temperament, fathers' CPB also predicted less subsequent anxiety symptoms, but with a steeper slope ($\beta = -.36$, $p < .001$). The region of significance revealed that the association between fathers' CPB and child anxiety symptoms becomes significantly negative for children with a fearful temperament level > −1.07 *SD* below the mean (i.e., for children with a fearful temperament lower than −1.07 *SD*, the relation is not significant). Thus, children high in fearful temperament seem to be marginally more susceptible to the buffering effects of fathers' CPB than low fearful children.

No significant interaction between child fearful temperament and mothers' CPB occurred ($\beta = .003$, $t(136) = 0.07$, $p = .943$; Table 2). Thus, the relation between mothers' CPB and child anxiety symptoms did not differ between children with different levels of fearful temperament.

Table 3
Results of the Multilevel Regression Models of Overprotective Parenting Behavior predicting Child Anxiety Symptoms.

	Direct		Relative	Joint	Interaction with fearful temp.	
	Father	Mother			Father	Mother
	β	β	β	β	β	β
Fathers' overprotection	−.12*		−.04	−.04	−.13*	
Mothers' overprotection		−.21***	−.19***	−.19**		−.20***
Fathers' × mothers' overprotection				.00		
Child fearful temperament					.03	.01
Fearful temperament × fathers' overprotection					.00	
Fearful temperament × mothers' overprotection						.03

Note. Direct: Separate models for mothers' and fathers' overprotection. Relative: Fathers' and mothers' overprotection are entered as simultaneous predictors. Joint: The interaction between fathers' and mothers' overprotection is tested. Temp. = temperament. Interaction with temperament model: Separate models for mothers' and fathers' overprotection.
***$p < .001$. **$p < .01$. *$p < .05$. $^{+}p < .10$.

3.4. Predictive relations between overprotective parenting behavior and child anxiety symptoms

The first direct-effects multilevel model revealed that, unexpectedly, fathers' overprotection predicted *less* child anxiety symptoms in early childhood; $\beta = -.12$, $t(150) = -2.27$, $p = .025$. The next model showed that mothers' overprotection also predicted *less* child anxiety symptoms; $\beta = -.21$, $t(140) = -4.34$, $p < .001$. Second, the relative-effects model revealed that when combined as two predictors in one model, mothers' overprotection significantly predicted less child anxiety symptoms; $\beta = -.19$, $t(143) = -3.58$, $p < .001$, whereas fathers' overprotection did not; $\beta = -.04$, $t(149) = -0.74$, $p = .462$. Thus, the relative contribution of mothers' overprotection to child anxiety symptoms seems to be larger than that of fathers. Third, the joint-effects model revealed no significant interaction ($\beta = .00$, $t(153) = 0.08$, $p = .937$) between fathers' and mothers' overprotection on child anxiety symptoms. All models are presented in Table 3.

3.5. Fearful temperament as a moderator of the relation between parental overprotection and child anxiety symptoms

To examine whether infants at risk for anxiety would suffer more from overprotective parenting behavior, we tested whether child fearful temperament moderates the relation between fathers' and mothers' overprotection and child anxiety symptoms. The interaction between child fearful temperament and fathers' overprotection was not significant ($\beta = .00$, $t(141) = 0.09$, $p = .932$; Table 3). The interaction between child fearful temperament and mothers' overprotection was also not significant ($\beta = .03$, $t(136) = 0.53$, $p = .600$). Thus, the relation between parents' overprotection and child anxiety symptoms did not differ between children with different levels of fearful temperament.

4. Discussion

We studied whether fathers' and mothers' more challenging and less overprotective parenting behavior predict less subsequent child anxiety symptoms in early childhood, by testing: 1) the direct effect of fathers' and of mothers' parenting behavior (separately); 2) the relative effects of fathers' and mothers' parenting behavior, that is, whether parenting behavior of the father is more important than that of the mother; 3) the joint effect of fathers' and mothers' parenting behavior in interaction. In addition, we studied whether young children with a fearful temperament would specifically benefit more from challenging and suffer more from overprotective parenting behavior. The results showed that, first, as predicted, more CPB of each parent predicts less subsequent anxiety symptoms, and, opposite to expectations, more overprotection also predicts less anxiety symptoms. Second, when looking at the relative contributions of father and mother in these effects, it was fathers' higher CPB that predicted less child anxiety symptoms, whereas it was mothers' higher overprotection that predicted less child anxiety. Third, when inspecting the joint contributions of father and mother, results showed that if the father is low in challenging, a high challenging mother can compensate, and vice versa, resulting in lower child anxiety symptoms. Fourth, fathers' CPB tended to predict less anxiety symptoms more strongly for infants high in fearful temperament.

A key result of this study is that fathers' CPB predicts less anxiety symptoms in young children, both as a separate predictor and relative to mothers' CPB. This supports theoretical models proposing a challenging role of the father that is possibly evolutionary based (Bögels & Perotti, 2011; Möller et al., 2013; Paquette, 2004) and plays a protective role in anxiety development (Bögels & Phares, 2008). In contrast to the five previous studies addressing this relation (i.e., Fliek et al., 2015; Lazarus et al., 2015, Majdandžić et al., 2014, 2018; Möller et al., 2015), this study was designed to assess CPB in a large array of observational contexts and thus provides a relatively strong case for this relation.

Our results suggest that it is especially *fathers'* physical and verbal encouragement of the child (e.g., by rough-and-tumble play, teasing, encouragement of engaging in physical or social challenges; Majdandžić et al., 2015) that mitigates subsequent anxiety. This behavior may provide children with opportunities to push their limits, to practice coping with challenging situations, and to experience that arousal (e.g., when being thrown into the air) can be associated with positive situations. In a recent small-scale study on fathering, StGeorge, Fletcher, and Palazzi (2016) found that fathers' behavior in rough-and-tumble play, more so than in toy play, was meaningfully related to child emotional and behavioral functioning and self-regulation, supporting the functional relevance of this challenging form of paternal play. Notably, the buffering effect of fathers' CPB on anxiety we found seemed to be somewhat stronger for children high in fearful temperament (discussed below). Thus, it seems that those children who by their fearful temperament are most vulnerable to develop anxiety problems benefit most from their fathers' CPB.

For mothers, CPB also predicted less subsequent child anxiety when studied as a separate predictor, irrespective of children's fearful temperament. However, the relative contribution of mothers' CPB was low when studied together with fathers' CPB, supporting the theory of Bögels and Perotti (2011) that fathers' CPB has a larger impact of child anxiety than mothers'. Importantly, the moderation effect we found shows that mothers can compensate for a less challenging father by displaying more CPB to favorably influence child anxiety outcome. Similarly, a challenging father can compensate for a less challenging mother. Previous studies found mixed results as to whether mothers' CPB predicts less (Lazarus et al., 2015; Majdandžić et al., 2018), more (Majdandžić et al., 2014), or no (Fliek et al., 2015; Möller et al., 2015) child anxiety. In view of the inconsistent findings across ages and

measurement instruments, it is important to further investigate the contexts, child ages, and child traits that affect the impact of mothers' CPB. It may be that CPB is expressed differently in mothers than in fathers. Previous studies found evidence for measurement invariance of self-rated CPB across fathers and mothers (Majdandžić et al., 2015, 2018), with some interparental differences in subconstructs of CPB. For example, Majdandžić et al. (2015) found that mothers rated themselves higher than fathers on challenging modeling at 1 year and lower on competition and rough-and-tumble play at 2.5 years, and were observed to show less physical CPB in toddlerhood than fathers. The finding of this study that mothers' observed CPB seems to have a beneficial effect on young children in two-parent families when the father is low on CPB, requires replication in future studies. In addition, future research should address whether differences and similarities in levels, compensatory, and child-outcome effects of parenting behavior between parents stem from gender (masculinity, femininity) or sex of the parents. This can for example be done by replicating this research in same-gender parents and other non-traditional families.

For overprotection, we found *negative* predictions from both fathers' and mothers' overprotection to child anxiety symptoms, opposite to our expectations. Moreover, the relative contribution of mothers' overprotection to subsequent child anxiety seemed to be larger than that of fathers. The negative associations found are in contrast with a large body of evidence that parenting constructs assumed to be similar to overprotection are positively related to child anxiety (i.e., overcontrol; McLeod et al., 2007; van der Bruggen et al., 2008), though only very few studies tested the causal or predictive relationship; most studies test cross-sectional associations. A recent meta-analysis distinguished overprotection from other parenting dimensions and found a small but positive effect size for this relation early in childhood (i.e., age 0–5 years; Möller et al., 2016), which was equally strong for fathers and mothers. An explanation for our opposite results involves the conceptualization of overprotection. According to Buss and Kiel (2013), there may be a curvilinear relation between parental sensitivity and child anxiety, with overprotection (preventing the child from engagement with novelty) at the extremely sensitive pole and intrusiveness (insensitively pushing the child towards novelty) at the extremely insensitive pole of the dimension, both increasing child anxiety, whereas sensitive encouragement, lying in the middle, is related to less anxiety. In a recent study they found support for such a curvilinear relation between mothers' encouragement to approach novelty and child separation anxiety in extremely inhibited children (Kiel, Premo, & Buss, 2016). Thus, protective behaviors may sometimes reflect parental sensitivity to the higher needs of their anxious infants for protection. Perhaps our operationalization of overprotection was not extreme enough to assess *over*protection at this young age; or the parents of our sample, from relatively high SES and not from particular risk groups, did not display the more extreme overprotective behaviors that may aggravate child anxiety. In line, the mean and variance of overprotection were limited. In addition, some degree of overprotection may be normative in the early years and not specifically associated with anxiety, in line with the lower effect sizes reported in younger samples (Möller et al., 2016; Van der Bruggen et al., 2008). Another explanation may involve the contexts in which overprotection is displayed. Kiel and Buss (2012) found that protective behavior displayed in low-threat, but not in high-threat, contexts relates to inhibited temperament and mediates the relation between age 2 inhibited temperament and age 3 shyness. It is thus important to further explore which observational contexts best assess functionally relevant overprotective behaviors.

The trend-level finding that children with a fearful temperament seem to benefit more from fathers' CPB suggests the occurrence of vantage sensitivity (Pluess & Belsky, 2013), because these same children did not appear to suffer more from the assumed negative effects of overprotection (which would suggest differential susceptibility). Fearful child temperament and its early precursors have been repeatedly found to function as susceptibility factors (Belsky & Pluess, 2009). Multiple physiologically systems have been implicated to underlie fearful temperament (reviewed in Buss & Kiel, 2013), such as hypersensitive amygdala and atypical cortisol patterns, and the trait has been linked to serotonin-related genotypes that convey increased susceptibility (i.e., the 5-HTTLPR polymorphism; Pauli-Pott, Friedl, Hinney, & Hebebrand, 2009). The current study supplements this evidence by showing that observed fearful temperament of the child in the first year of life may convey increased sensitivity to fathers' CPB, a positive environmental influence that may buffer against anxiety development.

This study adds to the only previous study addressing the relations between *observed* CPB and child anxiety (Majdandžić et al., 2014) in that an array of different tasks was used that were specifically developed to assess CPB in an observational context (Majdandžić et al., 2015), where Majdandžić et al.'s (2014) study was not specifically designed to measure CPB. Another strength of this study is the use of a clinically relevant outcome measure, addressing symptoms of child anxiety in various contexts. In addition, the study attempted to shed more light on the role of child fearful temperament as a susceptibility factor, by examining this trait in the context of assumed adverse (overprotection) and beneficial (fathers' CPB) environmental contexts.

Next to these strengths, our study has several limitations, which offer directions for future research. First, though longitudinal, the use of a non-experimental design precludes the possibility to draw strong causal inferences about the relations between CPB and child anxiety. Second, in spite of the current acknowledgment of the importance of ethnicity and culture in studying child development (Quintana et al., 2006), this study traditionally relied on a Caucasian sample (Henrich, Heine, & Norenzayan, 2010), that was relatively highly educated. It is theoretically relevant to assess CPB in other cultures, because its frequency and meaning may differ in more collectivistic cultures (Paquette, 2004). In addition, culture may affect susceptibility in GxE interactions (Van IJzendoorn, Belsky, & Bakermans-Kranenburg, 2012), which may also hold for child fearful temperament. Third, we studied a community sample, whereas an at risk sample (for example children of clinically referred parents with anxiety disorders) may have resulted in stronger effects of parenting. Fourth, although parenting behavior was measured in a large set of different situations, including the lab and at home, we relied on specific tasks and did not assess parenting as it naturally occurs in daily life. A thorough exploration of the contexts in which mothers and fathers show challenging and overprotective behaviors, as well as a comprehensive account of these behaviors in families' daily lives may reveal additional inter-parental differences in frequency, contexts and effects of parenting behaviors.

Now that two observational studies (the current study and Majdandžić et al., 2014), next to three questionnaire studies (Lazarus et al., 2015; Majdandžić et al., 2018; Möller et al., 2015) showed negative relations between fathers' CPB and child anxiety, this behavior may be considered as a potential target for the prevention or treatment of child anxiety disorders. It seems particularly important to include fathers in such efforts. The accumulating evidence of a potential buffering role of fathers' CPB also necessitates investigating whether parents' own anxiety influences this behavior. Lazarus et al. (2015) found no association between parental anxiety and their self-rated CPB, but to our knowledge no studies so far addressed this question for observed parenting behavior. Future research should address this, taking into account the parenting contexts that may be relevant to specific parental anxiety disorders (Murray et al., 2012).

In sum, this longitudinal observational study provides support for a protective role of fathers' CPB in anxiety in early childhood. Tentative evidence suggests that this buffering effects is larger for children who, by their fearful temperament, are most vulnerable to develop anxiety problems. Parents can compensate for a less challenging partner when they display more CPB, resulting in less child anxiety. The finding that

maternal overprotection mitigates child anxiety challenges theories that maternal overprotection increases child anxiety and requires further investigation.

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