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# Challenging Parenting Behavior from Infancy to Toddlerhood: Etiology, Measurement, and Differences between Fathers and Mothers

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Based on evidence that fathers show more challenging and physical play than mothers, it has been theorized that fathers have a different parenting role, more focused at stimulating exploration and taking chances. Challenging parenting behavior (CPB) may foster confidence and buffer against anxiety development in children. In this study, CPB was assessed in fathers and mothers at child ages of 4 months, 1 year, and 2.5 years, using newly developed questionnaires and observational tasks. Reliability of the questionnaire and observational measures was good, and fathers' and mothers' self-rated CPB showed a similar factor structure. Modest and significant convergence between questionnaires and observations provided support for validity of CPB, whereas negative correlations with overprotection supported divergent validity. CPB correlated positively with warmth. We further found moderate to high stability of CPB from early infancy to toddlerhood, and interparental correspondence in CPB. Fathers and mothers did not differ in observed CPB, but fathers rated themselves higher than mothers in toddlerhood. It is concluded that the development of the instruments to assess CPB was successful. Overall, the results reveal similarities rather than differences between fathers' and mothers' CPB in early childhood. The potential relevance of CPB in child development and psychopathology is discussed.

In recent years, research into the role of the father in child rearing has accumulated, and fathers' importance for child development has been established (Cabrera & Tamis-LeMonda, 2013; Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Geary, 2010; Lamb, 2010). Several reviews stress the similarities in parenting behavior between fathers and mothers (e.g., Fagan, Day, Lamb, & Cabrera, 2014; Lamb, 2010; Tamis-LeMonda, 2004), or contend that they play complementary roles (Cabrera, Fitzgerald, Bradley, & Roggman, 2014). However, one area of parenting behavior in which fathers

and mothers seem to differ is their quality of play, in particular the amount of physical play (Cabrera et al., 2014; Möller, Majdandžić, de Vente, & Bögels, 2013). This has led several scholars to develop theoretical models proposing that fathers play a different role in children's development than mothers (Bögels & Perotti, 2011; Bögels & Phares, 2008; Paquette, 2004), and to develop new constructs and measures based on fathers' presumed role (e.g., Fletcher, StGeorge, & Freeman, 2013; Paquette & Bigras, 2012; Stevenson & Crnic, 2013). This role may be characterized by behavior that promotes assertiveness, taking chances, and overcoming limits. We propose to denote this "challenging parenting behavior" (CPB), a new construct broader than physical play alone, including also verbal/socio-emotional aspects. In this study, we describe the empirical and theoretical basis that inspired the development of the CPB construct, present new ways to measure it in early childhood, and address to what extent fathers and mothers in Western two-parent families show similarities or differences in CPB toward their child from infancy to toddlerhood.

In their recent model on fathering, Cabrera et al. (2014) stress the flexibility and malleability of fathers' (and mothers') roles and its dependence on the social/economic context, such as parental personality, rearing history, demographic context, and family structure. Fathers' and mothers' roles are depicted as complementary; both parents make a unique contribution to children's development that is over and above the contribution of the other. Both fathers and mothers are capable of, and do show, warmth, sensitivity, and authoritative discipline to their child (Cabrera et al., 2014; Fagan et al., 2014). Fagan et al. (2014) describe how societal changes in Western countries (i.e., women's increased participation in the paid labor market) have led to increased paternal involvement in child care and, correspondingly, increased similarity between fathers' and mothers' parenting roles. They argue that the parenting behaviors fathers and mothers exhibit are the same and that researchers should study the same parenting constructs across fathers and mothers. Apart from the question whether parenting constructs are the same, there may be differences in meaning and processes of mothers' and fathers' parenting behaviors (Palkovitz, Trask, & Adamsons, 2014). One area of parenting in which there may be meaningful parent gender differences is the quantity and quality of play (Fagan et al., 2014). The most striking difference between fathers and mothers seems the amount of CPB they exhibit to their children.

Quantitative differences in parenting behavior between fathers and mothers have been demonstrated in a wide range of cultures. In spite of changes toward more involvement in child care (Fagan et al., 2014), fathers still generally spend less time with their children than mothers both cross-culturally (reviewed in Geary, 2010) and in Western societies (Lawson & Mace, 2009; Sayer, Bianchi, & Robinson, 2004; Yeung, Sandberg, Davis-Kean, & Hofferth, 2001). However, as demonstrated by several epidemiological studies using large contemporary Western samples, fathers and mothers also differ in the amount of time spent in *specific* parenting activities. In a sample of two-parent American families with children aged 0–12 years, Yeung et al. (2001) found that fathers engaged less than mothers in activities related to caregiving, play, teaching, and household and social activities, but more in specific play activities such as coaching and teaching sports and other outdoor play. Similarly, in a sample of American parents with children aged 0–18 years, Sayer et al. (2004) found that while mothers spend about twice as much time on child care activities than fathers, this difference is much smaller for teaching and play activities. In the same line, Lawson and

Mace (2009) found that mothers spent more time on parenting activities than their partner (mostly the father of the child) across child age 1.5–9 years. This was found for each parenting activity, except for physical play, in which fathers engaged more than mothers from child age of 3.5 years onwards.

The pattern that fathers spend relatively more time than mothers playing with their child has been confirmed by several smaller scale empirical studies in preschool aged children (e.g., Bonney, Kelley, & Levant, 1999; McBride & Mills, 1993). Importantly, the type of play fathers engage in is also qualitatively different from that of mothers. Mothers engage in more pretend play with their preschoolers than fathers (e.g., Lindsey & Mize, 2001; Lindsey, Mize, & Pettit, 1997). Paternal play is more often physical, such as rough-and-tumble play, than maternal play (e.g., Carson, Burks, & Parke, 1993; Lindsey & Mize, 2001). Although mothers of course also exhibit these behaviors (e.g., Paquette, Carbonneau, Dubeau, Bigras, & Tremblay, 2003), the available evidence suggests a relatively consistent picture of higher levels of CPB-related parenting behavior in fathers in Western two-parent families (Möller et al., 2013).

Why do fathers show more physical play and, more generally, CPB with their children than mothers? One approach that can be used to explain these differences is evolutionary theory. It has been suggested that differences in parenting behavior between mothers and fathers have an evolutionary basis (Bjorklund, Yunger, & Pellegrini, 2002; Geary & Flinn, 2001; Möller et al., 2013; Paquette, 2004). Evolutionary models propose that the major forces that drove the evolution of human family dynamics involved social factors, and in particular social competition and cooperation with conspecifics (Geary & Flinn, 2001). Möller et al. (2013) argue that evolutionary factors, such as males' higher potential rate of reproduction compared to females', resulting in male–male competition for mates (Geary & Flinn, 2001), in combination with paternity uncertainty, foster more risk-taking behavior in males, which is reflected in their parenting behavior. In contrast, females' lower potential rate of reproduction, certainty about biological relatedness to their children, and larger investment from the start of gestation (Geary & Flinn, 2001), may result in more careful and protective parenting behavior. In their review on parental differences in Western societies, Möller et al. (2013) present empirical findings that support the idea that fathers prepare their children to a larger extent for (social) competition, while mothers put more emphasis on protection, care, and maintaining intimate relations.

Such evolutionary models that explain human (differences in) behavior in contemporary societies and the testability of their assertions have been criticized (e.g., Bolhuis, Brown, Richardson, & Laland, 2011), but evolutionary research makes use of a set of established methods from various sources that, if yielding converging evidence, support the notion that our evolutionary past is still reflected in our current behavior (Shackelford & Liddle, 2014). This does not deny the role of societal forces in the manifestation of parenting roles. For instance, the increased participation of women in the labor force suggests that mothers can also teach children about (social) competition, just as fathers' increased involvement in child care underscores their ability to be nurturing, warm, and emotionally available. Nor does evolutionary theory preclude the existence of individual differences and of transactional processes in which children and parents mutually influence each other over the course of development; such proximal explanations of behavior are valid next to, and reciprocally influencing, ultimate evolutionary explanations (Laland, Sterelny, Odling-Smee, Hoppitt, & Uller, 2011). Available evidence and theories suggest that evolved tendencies toward specific parent-

ing behaviors (risk taking and competition for fathers, nurturance, and protection for mothers) are still reflected in modern families (Möller et al., 2013). In any case, the extent to which the roles of mothers and fathers are different or similar, in which contexts they occur, and how they change, is an empirical question that requires continued investigation.

The increased research focus on fathers, in combination with empirical findings of differences in specific parenting behaviors, inspired several researchers to develop models that distinguish between fathers' and mothers' role in parenting (e.g., Bögels & Perotti, 2011; Grossman et al., 2002; Paquette, 2004). Notably, Paquette (2004) posits that, whereas children form an attachment relationship with both their mother and father, the essence or nature of the relationship with mother and father is different. That is, the mother-child relationship is primarily an attachment relationship, essentially directed toward maintaining harmony around the child, and characterized by calming, soothing, and comforting the child in times of stress. In contrast, the emotional bond between father and child is an activation relationship, comprising aspects of destabilization, and with "the function of opening children to the outside world" (p. 198). In this activation relationship, the father stimulates, surprises, and excites the child, and encourages her to take risks. This enables the child to learn to be braver in unfamiliar situations and with strangers, to explore the world, to overcome obstacles, and to stand up for herself (Paquette & Bigras, 2012).

Bögels (Bögels & Perotti, 2011; Bögels & Phares, 2008) goes one step further by postulating that paternal CPB plays a different role in the development of child anxiety. She argues 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; Bögels & Perotti, 2011). Thus, children may instinctively be more influenced by the information signaled by paternal versus maternal behavior with respect to potential external threat. Bögels and Phares (2008) argue that the roles of the father at various stages of the child's development that are relevant for preventing child anxiety (e.g., physical play during toddlerhood) are more affected by fathers' own anxiety than the roles of the mother (e.g., care). That is, an anxious father may not be able to challenge his child, encourage risk taking, and engage in energetic physical play. According to these models, fathers' CPB is thought to buffer against anxiety development, at least for children vulnerable to develop anxiety. A recent study supported this prediction by demonstrating that fathers' observed CPB predicted a decrease in 4-year-olds' observed social anxiety, whereas mothers' CPB predicted an increase in it (Majdandžić, Möller, De Vente, Bögels, & Van den Boom, 2014). In line, Möller, Majdandžić, and Bögels (2014) found that self-rated paternal, but not maternal, CPB was associated with less anxiety in 1-year-old infants. In contrast, Fliek, Daemen, Roelofs, and Muris (2015) found no association between self-rated paternal and maternal rough-and-tumble play and encouragement, and preschoolers' anxiety. Thus, there is initial evidence not only for a difference between fathers and mothers in the quantity of CPB, but also in its effect on child development.

Paquette's (2004) model has been challenged for its emphasis on (paternal) play alone, its dichotomization of fathers' and mothers' role, and its strong contrast between the activation and the attachment relationship (Roggman, 2004); its attribution of fathers' parenting style to biology alone; and its emphasis on one role for fathers and one for mothers (Tamis-LeMonda, 2004). Several father researchers stress

that fathers' and mothers' role are complementary rather than different (Cabrera et al., 2014), with each parent (capable of) exhibiting all parenting behaviors (Fagan et al., 2014; Tamis-LeMonda, 2004). They stress the dependence of parents' roles on social/economic contexts and present alternative sociological, cultural, and economic perspectives on fathering (Cabrera & Tamis-LeMonda, 2013), such as social learning theory to explain fathers' role (Tamis-LeMonda, 2004). Moreover, it is clear that there is substantial variability within fathers and within mothers regarding parenting behavior. Thus, the extent to which fathers' role is "unique" in terms of the amount, quality, and effect of their parenting behavior, in particular CPB-like behavior, is subject of continuing debate.

Regardless of once stance in this debate, the models specifically aimed at describing and explaining paternal behavior have inspired researchers to develop new measures that focus on CPB-like parenting, expanding existing parenting research on dimensions such as warmth, responsiveness, overcontrol, rejection, and discipline. These paradigms include observational measures and coding systems, such as the Sensitive and Challenging Interactive Play scale assessing sensitive autonomy granting in a sedentary situation (Grossman et al., 2002), the Play Regulation Coding Scheme assessing dominance in a free play situation (Flanders et al., 2010), the Rough-and-Tumble Play Quality measure assessing the quality of physical play during three physical tasks (Fletcher et al., 2013), a measure to assess 'activative' fathering, encompassing a combination of cognitive stimulation, proximity to the child, intrusiveness, and (negatively) detachedness (Stevenson & Crnic, 2013), and the Risky Situation, which does not measure actual paternal behavior in the situation but is assumed to reflect the history of the father-child activation relationship (Paquette & Bigras, 2010; Gaumon & Paquette, 2013). There is also a small number of questionnaires inspired on fathering, that is, the Opening to the World Questionnaire assessing stimulation of perseverance and risk taking, and punishment (OWQ, see StGeorge, Fletcher, Freeman, Paquette, & Dumont, 2015), and the Parental Play and Care Questionnaire assessing rough-and-tumble play and challenge/encouragement (Fliet et al., 2015), and several single item questionnaires that assess the frequency of rough-and-tumble play (e.g., StGeorge et al., 2015). These measures have been used to study the role of these constructs in teaching children regulation of emotion and aggression, and social competence.

Most of these constructs and instruments focus only on limited aspects of CPB such as physical play, use either questionnaires or observations in a restricted number of situations, are not longitudinal, and use small samples that include only fathers. Therefore, a more comprehensive assessment of CPB is needed at multiple child ages. In addition, there is continuing debate on whether parenting constructs for fathers and mothers are the same (apart from the quantity in which they are shown; Fagan et al., 2014), versus different in meaning and effect (Palkovitz et al., 2014). Thus, if a focus on fathering inspired researchers to develop new constructs and measures, such as CPB, these concepts have to be validated in both fathers and mothers (Fagan et al., 2014). In addition, as child characteristics affect how fathering and mothering unfolds (Cabrera et al., 2014; Sameroff, 2010), it is important to study the effect of child characteristics relevant to parents' CPB, such as gross motor development.

The aim of the current study was to develop and substantiate the construct of CPB and to test new measures to assess it in early childhood. We defined CPB as a collection of behaviors in which the parent excites, surprises, and momentarily destabilizes

the child (Paquette, 2004). The parent encourages the child 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. This can be performed both physically and socio-emotionally. Examples of CPB are rough-and-tumble play, tickling, chasing the child, giving her a fright, teasing, competing, defeating her in a game, encouraging her to push her limits either physically (e.g., climbing higher than she normally dares), or socio-emotionally (e.g., performing for an audience, being assertive), and modeling of challenging behavior. By including a socio-emotional component, CPB is broader than physical play (e.g., rough-and-tumble play), of which the nature (Carson et al., 1993; Paquette, 2004) and consequences (e.g., Carson et al., 1993; Flanders et al., 2010; Paquette et al., 2003) have been addressed in previous studies.

The goal of the current study was twofold. Methodologically, we aimed to assess psychometric properties of a set of newly developed questionnaires and observational measures of CPB from infancy to toddlerhood. Theoretically, we aimed to assess stability of CPB from early infancy into toddlerhood, correspondence (associations) in CPB between fathers and mothers, and differences in mean levels between fathers and mothers. Lastly, we addressed child effects on parents' CPB by assessing its association with child motor development. We compared psychometrics and substantive characteristics of CPB with the two well-studied parenting dimensions overprotection and warmth.

We sought to develop reliable measures of CPB by theoretically driven selection of age-appropriate questionnaire items and observational tasks, by asking for parents' self-ratings of concrete parenting behavior in specific situations (see Putnam & Stifter, 2008; for this approach in the development of temperament questionnaires), and by observing CPB in a large number and variety of contexts, including structured and free play situations in the laboratory and at home. In line with previous studies on parenting (e.g., Hawes & Dadds, 2006), we expected modest to moderate convergence between observational and self-report measures of CPB, because of the different merits and limitations of both methods of assessment (Rothbart & Goldsmith, 1985), and the different contexts in which behavior is sampled.

We addressed the factor structure of self-reported CPB, exploring whether the sub-components of CPB we developed loaded on a single factor. In addition, we tested metric equivalence (i.e., invariance of factor loadings) across fathers and mothers. We had no clear expectations on factor equivalence across parents, in view of differences found in some (e.g., in warmth, Adamsons & Buehler, 2007), and invariance found in other studies (e.g., in a range of parenting dimensions; Van Leeuwen & Vermulst, 2004). Moreover, the factor structure of CPB has not previously been addressed.

We addressed divergent validity of CPB by exploring its associations with overprotection and warmth. Because of its nature of encouraging taking risks, and pushing social and physical limits, CPB was expected to be inversely related to overprotection, which entails conveying exaggerated worry or concern for the child's well-being and safety (Rubin, Coplan, & Bowker, 2009). For warmth, no relation with CPB was expected, as high warmth, or high empathy, may prevent parents to challenge children's limits, whereas little warmth may be associated with indifference in teaching children to cross their limits.

Parenting behavior has been found to show some stability from infancy to early childhood (Holden & Miller, 1999). For example, Rimehaug, Wallander, and Berg-Nielsen (2011) found moderate stability of overprotection and warmth in parents

of 8- to 15-year-old children, over a period of 9 months. Therefore, CPB was expected to show moderate stability from infancy to toddlerhood.

Further, we expected significant intercorrelations between fathers' and mothers' CPB because of significant associations between fathers' and mothers' parenting (e.g., Verhoeven, Junger, van Aken, Deković, & van Aken, 2010). Based on the literature described above, we expected that fathers would be more challenging toward their child than mothers. Lastly, we expected that higher levels of gross motor development in children were associated with more CPB in both parents, because CPB is expected to foster the development of gross motor skills (Pellegrini & Smith, 1998), and because children with poorer motor skills are likely to elicit less CPB.

## METHODS

### Participants

Participants that 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 social anxiety in young children (Aktar, Majdandžić, de Vente, & Bögels, 2013; De Vente, Majdandžić, Colonesi, & Bögels, 2011). 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 were cohabiting at the first postnatal measurement.

Of the 151 families who started participation in the study at the prenatal measurement, 22 families dropped because they found participation with their young baby too complicated or time consuming. At the first postnatal measurement (Time 1) when the baby was 4 months old, 129 couples (71 with a girl, 58 with a boy) took part in the study; at the second postnatal measurement (Time 2) when the baby was 1 year old, 127 couples still participated; and at the third (Time 3) when the child was 2.5 years, 123 couples took part in the study. Mean age of the children and sample size for questionnaires and observations are presented in Table 1. Dropping out was mainly due to parents finding participation too time consuming or having moved out of the area. 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

TABLE 1  
Child Age and Sample Size for Questionnaires and Observations

<i>Data wave</i>	<i>Child age</i> <i>M (SD)</i>	<i>Total n</i>	<i>n Questionnaires</i>		<i>n Observations</i>	
			<i>Mother</i>	<i>Father</i>	<i>Mother</i>	<i>Father</i>
Time 1	17.98 weeks (1.54)	129	118	115	127	128
Time 2	12.59 months (0.75)	127	117	115	124	124
Time 3	30.54 months (0.63)	123	110	110	122	120

*Note:* There were 116 families that participated in all three postnatal measurement occasions.

adequate command of the Dutch or English language, and if their baby had no neurological deficits, a birth weight above 2500 grams, and an Apgar score above 7.

The vast majority of participants was of Dutch origin (95% of fathers and 91% of mothers). Educational level was fairly high: for mothers:  $M = 6.96$ ,  $SD = 1.17$ , range 1–8 (on a scale from 1 – *primary education*, to 8: *university*); for fathers:  $M = 6.45$ ,  $SD = 1.69$ , range 1–8. Mothers' professional level was  $M = 8.53$ ,  $SD = 2.32$  (range 1–11), and fathers' professional level was  $M = 8.17$ ,  $SD = 2.65$  (range 2–11), 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, based on educational and professional level, socioeconomic status of the parents was relatively high. Mothers' mean age at Time 1 was 31.89 years,  $SD = 4.21$ , and fathers' mean age was 34.82 years,  $SD = 5.41$ .

## Procedure

At Time 1, Time 2, and Time 3, mothers and fathers visited the laboratory separately with their child, and home visits were made. During these visits, various tasks were conducted to assess child temperament, social referencing, social understanding, coparenting, and parenting. The current study focuses on parenting behavior. Two weeks before the laboratory visits, a set of questionnaires, including one on demographic information, was sent to the parents to be completed individually and returned at the laboratory visit. During the laboratory visits, parents received a second set of questionnaires, including one on parenting behavior, to be filled out at home individually and returned by mail.

## Measures

### *Self-rated parenting behavior*

Parents' parenting behavior was assessed by self-report with the Comprehensive Parenting Behavior Questionnaire (CPBQ; Majdandžić, de Vente, & Bögels, 2008). This questionnaire has five age-specific versions applicable for parents of children from 3 months to 12 years (i.e., the CPBQ-0 for parents of children 3–11 months; the CPBQ-1 for parents of children 12–23 months; the CPBQ2-3 for parents of children 2–3 years; the CPBQ4-6 for parents of children 4–6 years; and the CPBQ7-12 for parents of children 7–12 years), and contains items of several existing questionnaires assessing parenting behavior, complemented with newly developed items specific for parents of young children, following the approach of Verhoeven, Junger, Van Aken, Deković, and Van Aken (2007). The questionnaires were piloted in groups of parents with children of the appropriate range ( $n = 18$  for CPBQ-0;  $n = 22$  for CPBQ-1;  $n = 16$  for CPBQ-2-3, and  $n = 21$  for CPBQ4-6). Based on item-total correlations and feedback of the parents, items were adjusted when necessary. The questionnaire includes the scales Challenging parenting behavior, Overinvolvement (consisting of Overprotection and Overcontrol), Warmth, Negativity, Negative discipline, and Positive discipline, each consisting of several subscales. In the current study, the scales CPB, Overprotection, and Warmth were used.

The CPB scale was newly developed and assesses the extent to which the parent encourages the child socio-emotionally and physically to exhibit risky behavior, or behavior that causes the child to go outside of his/her comfort zone. The original scale

included seven subscales of CPB: teasing, rough-and-tumble play, encouragement of risk taking, social daring, competition, encouragement of assertiveness, and challenging modeling. The Overprotection scale assesses the extent to which the parent exerts (over-)protective behaviors that limit exposure to new objects, people, or situations. The Warmth scale assesses the extent to which the parent expresses love and affection to the child. Items were rated on 5-point Likert scales from 1 = totally not applicable, to 5 = completely applicable.

At Time 1 (child age 4 months), the 81-item CPBQ-0 was used. Its original CPB scale consisted of 22 items. Reliability analyses, described in the Results section, resulted in a CPB scale of 17 items, consisting of two subscales: teasing/rough-and-tumble play (10 items) and social daring (7 items). The items are presented in Appendix A. The Overprotection scale of the CPBQ-0 consists of 28 items, some of which come from the MFP (Bögels & Van Melick, 2004; Epstein, 1983); the others were newly developed. An example is: "I constantly keep an eye on my child to prevent him/her from getting hurt." Warmth consists of 16 items, some of which come from the Parent Behavior Checklist (Fox, 1994), from the Parenting Styles and Dimension Questionnaire (Wu et al., 2002), from the Nijmeegse Parenting Questionnaire (Gerris et al., 1993), and from the Parenting Practices Scale (Strayhorn & Weidman, 1988; Dutch translation Verhoeven et al., 2007). An example is: "I regularly play or talk with my child for at least 5 min, with our attention focused on one other, just for fun".

At Time 2 (child age 12 months), the 125-item CPBQ-1 was used. Its original CPB scale consisted of 46 items. Reliability analyses resulted in a CPB total scale of 36 items, consisting of four subscales: teasing (10 items), rough-and-tumble play (11 items), social daring (8 items), and modeling (7 items). The items are presented in Appendix B. The Overprotection scale of this version consists of 17 items and Warmth of 16 items.

At Time 3 (child age 2.5 year), the 151-item CPBQ-3 was used. Its original CPB scale consisted of 43 items. Reliability analyses resulted in a CPB total scale of 39 items, consisting of six subscales: teasing (6 items), rough-and-tumble play (6 items), encouragement of risk taking (5 items), social daring (10 items), competition (4 items), and modeling (6 items). The items are presented in Appendix C. The Overprotection scale consists of 11 items and Warmth of 24 items.

### *Observed parenting behavior*

*Procedure.* All observational tasks were conducted by a female experimenter who instructed the parent. The laboratory visits took place in a large comfortable room. The tasks were interspersed with breaks and with other tasks (not used in the current study) in a fixed order, which could be changed if the mood of the child required so. The tasks conducted in the laboratory were videotaped using three unobtrusive moveable cameras attached to the walls in the room, operated from behind a one-way screen, and those at the home visit using a hand held camera. Observational tasks were developed to assess the parenting constructs in an age-appropriate manner, that is, taking into account the age of the child.

At Time 1, observed parenting behavior of fathers and mothers was measured using nine tasks. Six were conducted during the laboratory visits: (1) In the first movement

task, the baby was lying on her back on a changing mat in front of the parent who was asked twice to bring the legs of the baby toward her hands and let them go. The legs of the baby would fall back on the mat depending on the way the parent handled the child; (2) in the second movement task, the baby was still lying on her back, and the parent was asked twice to put the baby into sitting position, and to put her back on her back; (3) in the third movement task, the parent was asked twice to pick the baby up and lift her in the air to “fly”; (4) in the first 2.5-min free play task, the baby was lying on her back on a hocker (85 × 85 cm) and the parent was given a box with toys (a rattle, a toy ring, a rubber squeak duck, and a soft block), and instructed to play with the baby as usual; (5) in the second 2.5-min free play task, the baby was still lying on her back, and the parent was instructed to play with her without toys. This situation allowed for physical play without explicit instruction to do so; and (6) in the dancing task, the parent was standing in the room while holding the baby and was asked to dance with the baby on a three-min song.

Three tasks were conducted during the home visit, one with each parent separately, and two with both parents together: (1) a 5 min free play task in which the parent (alone) was instructed to play with the baby without toys. This was usually performed on a couch or table with a cloth; (2) a handling task in which one parent was asked to hand the baby to the other parent with her belly on the right forearm and her face toward the elbow, and the other parent was asked to hand the baby back in the same way; and (3) a swinging task in which the parents were asked to put the baby in a blanket, each hold one side of the blanket, lift it up, and swing it sideward.

At Time 2, 10 tasks were conducted to assess observed parenting behavior, three during the laboratory visits: (1) a 5-min free play task with toys, in which the parent and child were seated on a mat on the floor (without shoes) and were given a box with toys to play with (a book with animal sounds, a soft ball, a glove with finger puppets, and various magnetic blocks); (2) a 5-min free play task without toys, in which cushions were placed on the mat and the parent was instructed to play with the child as usual. This situation allowed for physical play without explicit instruction to do so; and (3) a dancing task in which the parent danced with his/her child on a 3-min song.

Seven tasks were conducted during the home visit, four with each parent separately, and three with both parents together: (1) a 5-min free play task, in which the parent (alone) played with the child without toys on a location in the house by choice (usually the couch); (2) a movement task, in which the child was lying on her back on a mat on a table and the (standing) parent was asked to grab the child’s ankles and wrists, lift her up, and swing her; (3) a second movement task, in which the parent (standing) was asked to hold the child against his/her body and let her fall face down toward the mat on the table while catching her in time; (4) a third movement task, in which the parent was asked to pick the child up and let her “fly”; (5) a handling task with both parents, in which each of the parents was asked in turn to play horse (hands and knees on the floor) with the child on his/her back, while the other parent was holding her; (6) a second handling task, in which one of the parents was asked to put the child on the neck of the other parent. After a short time, the other parent was asked to do the same; and (7) a swinging task, in which the parents were asked to swing the child in a blanket.

At Time 3, 12 tasks were conducted to assess observed parenting behavior, seven during the laboratory visits: (1) a movement task, in which the parent was asked to put the child on an oval space hopper and let her ride horse; (2) a second movement

task, in which the parent was asked to let the child role over the space hopper twice; (3) a third movement task, in which the parent was asked to pick the child up and let her “fly” (see Time 2); (4) a 5-min free play task without toys on a mat on the floor (without shoes), with cushions and a large beanbag where the parent was instructed to play with the child as usual; (5) a 5-min free play task on the mat with toys (a hand puppet, a box with blocks, a puzzle, a ball, a book, a hammer game and a play dinner set); (6) a 3-min cleanup task, in which parent and child were told they had a few minutes to clean up the toys together; (7) a 10-min Risk room, in which the room was filled with several challenging toys (one of two counterbalanced sets; set A: stepping stones, a child sized trampoline, a rocking horse, a mobile play turtle on which the child could sit, a hairy lion mask, and a large play barrel; set B: stepping stones attached to each other, two three-steps stairs, a large toy top in which the child could sit and rock around, a space hopper cow, a large black box with eyes and teeth, a play tunnel), and the parent was invited to play with the child with all the toys, while the experimenter left the room.

Five tasks were conducted during the home visit: (8) a 5-min free play task, in which the parent (alone) was asked to play with the child with toys present in the house; (9) a cleanup task, in which parent and child were asked to clean up the toys; (10) a 5-min free play task, in which the parent was asked to play with the child without toys; and (11) a handling task with both parents, in which one parent was asked to put the child on the other parent’s back (standing). After a short time, the other parent was asked to put the child on the back of the (standing) first parent (see Time 2); (12) a swinging task, in which the parents were asked to swing the child in a blanket.

*Coding.* In the free play tasks, and in the cleanup tasks and risk room at Time 3, the following parenting dimensions were coded: Challenging parenting behavior, Intrusiveness, Overprotection, Warmth, Responsivity, Negativity, and, at Time 2 and 3: Discipline and Permissivity. In all the other tasks, only CPB and overprotection were coded. The dimensions used in the current study are CPB, Overprotection, and Warmth.

For coding, the tasks were divided into coding intervals, which lasted 30 sec. (Time 1) or 1 min. (Time 2 and 3) in the free play, cleanup, and risk room tasks, and depended on the course of the task in the other tasks. All parenting dimensions were rated on 5-point scales. 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. The coding system was adjusted to the age of the child, so that, for example, overprotection to a 4-month-old infant differed from overprotection to a toddler.

Challenging parenting behavior 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. Indicators (nonexhaustive examples) of low scores for CPB reflect the absence of physical stimulating play or verbal encouragement (1), or a fairly quiet chase, saying “whoeee” in a quiet tone of voice, playfully pointing in the baby’s belly, very gently swinging the blanket in which the child lies, or gently hopping the toddler on the space hopper (2).

Indicators for medium scores (3) are “chasing” the baby with the hand puppet, moderate intensity tickling, moderate intensity hopping with the child on the parent’s back or neck, gentle wrestling, or gently striking the child with a pillow. Indicators of high scores (4, 5) are dancing wildly with the baby, throwing the baby in the air, encouraging the (4-month-old) baby to come to sit by lifting her by her arms without supporting the head, swinging the child in the blanket with high speed and height, giving the child a fright for fun, chasing the child with growling noises or “I am going to catch you!”, wild rough-and-tumble play, spinning the child wildly around, making tension increasing sounds of high intensity (“yoohoooo!”), challenging the child to push her limits by saying “Show me that you can do that!”, or encouraging the toddler to jump down the stairs in the Risk room. At Time 3, physical and verbal CPB were separately coded (physical CPB, verbal CPB).

Overprotection reflected the extent to which the parent conveyed exaggerated worry or concern for the child’s well-being and safety. Indicators of low scores for Overprotection reflected the absence of any signs of worried or careful behavior (1), or ‘normal’ careful handling of the child such as supporting the head of the baby, without tension in the parent, or making an exaggerated remark about fatigue of the child (2). Indicators for medium scores (3) are holding the child more firmly than necessary during climbing or hopping on the space hopper, comforting the baby while not or barely crying, or making a clear but not extreme remark about safety: “Not too fast.”. Indicators of high scores (4, 5) are handling the baby very careful during the structured tasks or flying game (supporting whole body and head, moving very gently), mostly accompanied by tension in the parent, or being very occupied with the safety of the child (“Watch out, careful!”, “That is dangerous!”). At Time 3, physical and verbal Overprotection were separately coded (physical Overprotection, verbal Overprotection).

Warmth reflected the extent to which the parent took the initiative to facially, verbally, or physically express affection to the child. Indicators of low scores for Warmth reflected the absence of affectionate initiatives of the parent (1), or a warm atmosphere, as apparent from friendly talk or attentiveness (2). Indicators for medium scores (3) are praising the child: “Well done!”, a short instance of stroking the child on the head, or clearly smiling at the child. Indicators of high scores (4, 5) are laughing together with the child, multiple instances of praise, or a clear instance of physical affection: hugging and kissing.

Coding at each measurement occasion was performed by different groups of observers (i.e., observers coded one measurement occasion). Coding at Time 1 and Time 2 was performed by four couples of two observers who coded all tasks of a given set of parents. Coding at Time 3 was performed by two groups: four observers coded the laboratory visit tasks and four the home visit tasks. All observers coded fathers as well as mothers, but did not code two parents of the same child (except for interobserver reliability). In the handling tasks with both parents, each parent’s behavior was separately coded. All observers were female and were trained by the first author (the master coder). Coding started after an intensive training period, and during coding, regular meetings were held for calibration and discussion of coding issues. Inter-rater reliability was assessed prior to coding and repeated during the drift meetings. Sixteen percent of the parents at Time 1 and 15% at Time 2 were also coded by the master coder, so that the master coder coded 28% of each observer’s parents. At Time 3, 21 percent of the parents were coded by all observers. Interobserver reliability was based

on the aggregated constructs (mean across tasks), which were the units of analysis, by calculating the intraclass correlation (ICC). Several tasks appeared not suitable to assess overprotection because of low occurrence of overprotective behavior: at Time 1, free play without toys (in the lab) had a negative item-total correlation for both parents; at Time 2, the second handling task (putting child on neck of other parent) lowered interobserver reliability; and at Time 3, cleaning up at home and in the laboratory lowered interobserver reliability and had low item-total correlation. These tasks were not included in the final constructs for overprotection.

Interobserver reliability of the aggregated constructs CPB, overprotection, and warmth was acceptable to high: at Time 1:  $M$  ICC across the four couples = .93 ( $SD = .02$ ) for CPB,  $M = .85$  ( $SD = .03$ ) for overprotection, and  $M = .88$  ( $SD = .05$ ) for warmth; at Time 2:  $M = .93$  ( $SD = .04$ ),  $M = .77$  ( $SD = .11$ ), and  $M = .88$  ( $SD = .04$ ), respectively. At Time 3, the ICC was calculated separately for the observers coding the home visit tasks: ICC = .90 for physical CPB, .70 for verbal CPB, .60 for physical overprotection, .75 for verbal overprotection, and .85 for warmth. For the laboratory visit tasks: ICC = .91 for physical CPB, .90 for verbal CPB, .73 for physical overprotection, .85 for verbal overprotection, and .77 for warmth.

### *Child motor development*

Children's motor development may affect parental CPB and vice versa. For instance, 4-month-olds with hypotonia (weak muscle tone) may induce less CPB, particularly in situations where parents handle the infant. Therefore, we also assessed children's gross motor development.

At Time 1 and 2, children's motor development was based on the child's behavior during all observed tasks. At Time 1, it was rated on a 5-point scale involving the child's alertness, muscle tone, ability to lift the head, and ability to grab. Interobserver reliability based on 16% of children was satisfactory:  $M$  ICC across 4 triplets of observers = .71 ( $SD = .13$ ). At Time 2, infants received a progressively higher score on a 5-point scale, when they were able to sit alone; slide across the floor on their belly; crawl; walk with help or pull their selves up to standing; and walk alone, respectively. Interobserver reliability based on 15% of children was good:  $M$  ICC across 4 triplets of observers = .85 ( $SD = .04$ ). Infant's motor development was significantly correlated across the two (mother, father) laboratory visits (at Time 1:  $r = .43$ ,  $p < .001$ ; at Time 2:  $r = .70$ ,  $p < .001$ ), and was averaged to create a motor development score for early and late infancy.

At 2.5 years, children conducted eight gross motor development tasks from the Bayley Scales of Infant Development-2 (Van der Meulen, Ruiter, Lutje Spelbert, & Smrkovsky, 2002). Version A (one lab visit): walking sideward, one leg balance (left, right), kick a ball; Version B (other lab visit): walk up stair, walk down stair, jump from stair step, walk on stepping stones (newly developed). Children's performance in each task was rated on 3- to 5-point scales. In consultation with a child physiotherapist, the scoring was slightly adjusted to capture variability across children. Two observers coded Versions A and B, respectively, and two other observers coded 21% of children for interobserver reliability. Interobserver reliability was high:  $M$  ICC across tasks = .93 ( $SD = .05$ ). The eight tasks showed acceptable coherence: Cronbach's alpha = .69, and were standardized and averaged to obtain a toddler motor development score.

### Analysis plan

The twofold methodological and theoretical aim of the study was analyzed in the following way. Methodologically, we conducted the following: (1) reliability analyses on the CPB questionnaire scale and on the observations; (2) multigroup confirmatory factor analysis to assess the factor structure of the CPB questionnaire scale and invariance of factor loadings across fathers and mothers; (3) correlational analyses to assess convergence between questionnaire and observational measures of CPB; and (4) correlations of CPB with overprotection and warmth to assess divergent validity. Theoretically, we conducted correlational analyses to assess: (5) stability of CPB from early infancy into toddlerhood; (6) correspondence (associations) in CPB between fathers and mothers. Subsequently, we conducted; (7) *t*-tests and MANOVAs to assess differences in mean levels of CPB between fathers and mothers; and (8) correlational analyses to assess the association of child motor development with parents' levels of CPB. Overprotection and warmth were used as comparison dimensions.

## RESULTS

### Preliminary analyses

Two sets of drop out analyses were conducted: First, we explored whether the families that dropped out after the prenatal measurement differed on demographic variables. Families that dropped out were lower educated: mothers:  $t(143) = 2.35$ ,  $p = .012$ ; fathers:  $t(147) = 2.43$ ,  $p = .016$ , but did not differ on other variables. Second, we explored whether the 6 families that dropped out between Time 1 and Time 3 differed on demographic variables, on observed and self-rated parenting behavior, and on child motor development. They did not differ on any of the study variables (all  $p > .05$ ), except that parents that dropped out rated themselves higher on overprotection: mothers:  $t(116) = -2.38$ ,  $p = .019$ ; fathers:  $t(17.7) = -3.55$ ,  $p = .002$ .

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 nonoutlier (Tabachnick & Fidell, 2001). Skewness and kurtosis was  $< |2|$  for all measures.

To explore whether child sex differences should be controlled for, we tested whether parents of sons and daughters differed in parenting behavior using independent sample *t*-tests. No significant differences between boys and girls were found for mothers' or fathers' self-rated or observed CPB, overprotection, and warmth. Therefore, child sex differences were not further addressed.

### Reliability of self-rated and observed CPB

#### *Questionnaires*

Reliability of the scales and subscales assessing parents' self-reported CPB is presented in Table 2, and the final version of the questionnaires in Appendices A–C. Reliability analyses were performed to improve the scales. Items with negative or low ( $< .10$ ) item-total correlation at the total scale or subscale level (5 at Time 1, 10 at Time 2, and 3 at Time 3) were removed. At Time 1, teasing and rough-and-tumble play were combined into one scale. At Time 2, encouragement of assertiveness and competition

TABLE 2  
Reliability (Cronbach's alpha) of the Questionnaire Scales of Challenging Parenting Behavior

Scale	Time 1			Time 2			Time 3		
	Items	Mother	Father	Items	Mother	Father	Items	Mother	Father
CPB total score	17	.79	.80	36	.88	.88	37	.89	.86
Teasing (Time 1: + RTP)	10	.79	.79	10	.76	.75	6	.72	.67
Rough-and-tumble play (RTP)				11	.80	.75	6	.80	.74
Encouragement of risk taking	–	–	–	–	–	–	5	.64	.64
Social daring	7	.70	.71	8	.70	.68	10	.62	.51
Competition	–	–	–	–	–	–	4	.66	.62
Challenging modeling	–	–	–	7	.73	.70	6	.60	.65

Note. CPB total score = higher order scale CPB. “–” = scale not present. At Time 1, RTP was combined with teasing into one scale.

were dropped because they were unreliable. At Time 3, social daring and encouragement of assertiveness were combined into one social daring scale. Internal consistency of the CPB total score was high for both fathers’ and mothers’ self-ratings on all measurement occasions. Internal consistency of the subscales was acceptable to good, except for fathers’ social daring at Time 3, which was .51.

Internal consistency of the scale Overprotection ranged from .72 to .82. (1 item was dropped at Time 1 and 2 because of negative item-total correlation); internal consistency of the scale Warmth ranged from .80 to .86.

**Observations**

In general, internal consistency of the tasks used to measure observed CPB, overprotection, and warmth was good (Table 3). Only physical and verbal overprotection at Time 3 showed lower consistency across tasks. Subsequently, tasks were averaged to obtain observational measures of CPB, overprotection, and warmth. At Time 3, physical and verbal CPB were separately coded, and appeared to be considerably correlated ( $r = .62, p < .001$  for mothers,  $r = .66, p < .001$  for fathers) and were averaged. Physical and verbal overprotections (separately coded at Time 3) were

TABLE 3  
Internal Consistency (Cronbach's alpha) of Observed Parenting Behavior across Tasks

Dimension	Time 1		Time 2		Time 3			
					Physical		Verbal	
	Mother	Father	Mother	Father	Mother	Father	Mother	Father
CPB	.69	.71	.69	.77	.68	.56	.65	.74
Overprotection	.68	.62	.76	.68	.49	.38	.37	.48
Warmth	.66	.75	.70	.74	.76 <sup>a</sup>	.53 <sup>a</sup>		

Note. At Time 1: 9 tasks for CPB, 8 for overprotection, 3 for warmth; at Time 2: 10 tasks for CPB, 9 for overprotection, 3 for warmth; at Time 3: 12 tasks for CPB, 10 for overprotection, 7 for warmth.

<sup>a</sup>. Warmth includes verbal and physical behaviors, not separately coded.

significantly correlated for mothers ( $r = .26$ ,  $p = .004$ ), but not for fathers ( $r = .13$ ,  $p = .158$ ), but were nevertheless averaged to obtain a more robust score for overprotection.

### Factor structure of self-rated CPB

To confirm the factor structure of the CPB construct, confirmatory factor analyses (CFAs) were performed on the questionnaire using AMOS 21 (Arbuckle, 2012). The CFAs were performed at the scale level, estimating the loadings of the scales on the latent CPB factor. Separate models were tested for fathers and mothers, and subsequently, multigroup comparisons were performed to assess equivalence of factor structure and factor loadings across fathers and mothers. No CFA was performed for Time 1 because it contained only two scales and was therefore unidentified (Kline, 2011). Pearson's correlation between these two scales (teasing/rough-and-tumble play and social daring) was for mothers  $r = .27$ ,  $p = .003$ , and for fathers  $r = .37$ ,  $p < .001$ .

A series of nested CFAs revealed that at Time 2, a multigroup model with equal factor loadings for fathers and mothers fitted the data best and showed excellent fit ( $\chi^2 = 10.09$ ,  $df = 7$ ,  $p = .183$ ; CFI = .99, NFI = .96, RMSEA = .04 (90% CI = .00–.10)). Similarly, at Time 3, a multigroup model with equal loadings for fathers and mothers fitted the data best and showed excellent fit ( $\chi^2 = 29.70$ ,  $df = 23$ ,  $p = .159$ ; CFI = .98, NFI = .93, RMSEA = .04 (90% CI = .00–.07)). Thus, at Time 2 and Time 3, factor loadings of the subscales on the CPB factor were equal for mothers and fathers (all scales loaded significantly on the factor:  $p < .001$ ). Standardized loadings for fathers and mothers are presented in Table 4.

### Convergence between questionnaires and observations of CPB

Correlations between observed and self-rated parenting behavior are shown in Table 5. Convergence between fathers' and mothers' self-rated and observed CPB was modest and significant, except for paternal CPB at Time 1. Measurement convergence for overprotection was lower, and for warmth absent.

TABLE 4  
Standardized Factor Loadings from the Confirmatory Factor Analysis on the Questionnaire Scales of Challenging Parenting Behavior

Scale	Time 2		Time 3	
	Mother	Father	Mother	Father
Teasing	.73	.70	.73	.63
Rough-and-tumble play	.78	.74	.68	.68
Encouragement of risk taking	–	–	.73	.65
Social daring	.54	.54	.71	.62
Competition	–	–	.66	.63
Challenging modeling	.66	.63	.68	.58

Note. "–" = scale not present. Results are based on multigroup CFA models with equal (unstandardized) factor loadings for mothers and fathers.

TABLE 5  
Correlations between Questionnaire and Observational Measures of Parenting Behavior

Scale	Mothers			Fathers		
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
CPB	.30**	.36***	.34***	.15	.27**	.31***
Overprotection	.26**	.16+	.24*	.25**	.10	.17+
Warmth	.08	.10	-.20*	.13	.16+	.12

\*\*\* $p < .001$ . \*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .

Divergent validity of CPB

As shown in Table 6, CPB was moderately negatively correlated with overprotection at Time 1 and 2, but not at Time 3 (except for fathers' self-ratings), for both methods of assessment. CPB was significantly positively correlated to warmth, except for observed parenting at Time 1.

Stability of self-rated and observed CPB

Self-rated parenting behavior was considerably stable from early to late infancy and into toddlerhood (all  $p < .001$ ; Table 7). Observed CPB was moderately stable, and most stable from Time 2 to Time 3. Observed warmth and overprotection were generally modestly stable from Time 1 to Time 2, but not stable from Time 2 to Time 3.

Associations between fathers' and mothers' CPB

To explore interparental correspondence in CPB, we assessed the associations between both parents of a child (Table 8). Paternal and maternal self-rated and observed CPB were modestly and significantly correlated. Interparental correspondence for overprotection was also modest and significant (except at Time 3), and for warmth low.

TABLE 6  
Divergent Validity of Challenging Parenting Behavior

Scale	Mothers		Fathers	
	Questionnaires	Observations	Questionnaires	Observations
CPB * Overprotection at Time 1	-.45***	-.60***	-.43***	-.58***
Time 2	-.33***	-.39***	-.48***	-.55***
Time 3	-.13	-.05	-.31**	.03
CPB * Warmth at Time 1	.26**	.15+	.34***	.03
Time 2	.36***	.34***	.46***	.39***
Time 3	.27**	.23*	.37***	.32*

\*\*\* $p < .001$ . \*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .

TABLE 7  
Stability of Parenting Behavior from Infancy to Toddlerhood

Scale	Mothers		Fathers	
	Questionnaires	Observations	Questionnaires	Observations
CPB Time 1–2	.58***	.40***	.63***	.39***
Time 1–3	.53***	.31***	.54***	.29**
Time 2–3	.80***	.65***	.65***	.47***
Overprotection Time 1–2	.69***	.31**	.64***	.17+
Time 1–3	.46***	-.03	.58***	.24**
Time 2–3	.54***	-.02	.63***	.12
Warmth Time 1–2	.66***	.24**	.55***	.37***
Time 1–3	.48***	.04	.47***	.13
Time 2–3	.54***	.14	.59***	.02

\*\*\**p* < .001. \*\**p* < .01. +*p* < .10.

TABLE 8  
Correlations between Fathers' and Mothers' Parenting Behavior

Scale	Time 1		Time 2		Time 3	
	Questionnaires	Observations	Questionnaires	Observations	Questionnaires	Observations
CPB	.37***	.44***	.38***	.39***	.42***	.27**
Overprotection	.44***	.40***	.43***	.31***	.27**	.04
Warmth	.03	.22*	.20*	.17+	.20*	.20*

\*\*\**p* < .001. \*\**p* < .01. \**p* < .05. +*p* < .10.

### Differences in levels of fathers' and mothers' CPB

First, we examined interparental differences in self-rated and observed parenting behavior on a global level (Table 9). Fathers rated themselves significantly higher than mothers on CPB at Time 3, *d* = .26, but not at Time 1, *d* = .11 and Time 2, *d* = .14. Fathers and mothers did not differ in observed CPB at Time 1, *d* = .05, Time 2, *d* = .14, and Time 3, *d* = .12. In contrast, mothers were significantly more overprotective than fathers for observations (*d* = .28, .43, and .31 at Time 1, Time 2, and Time 3, respectively), but not for self-ratings (*d* = .01, .06, and .10, respectively). Mothers were significantly warmer than fathers on all measurement occasions (*d* = .74, .87, and .83 for self-ratings, and .26, .39, and .35 for observations, respectively).

Second, we assessed interparental differences at the level of the subscales of self-rated CPB using MANOVAs. At Time 1 (with two subscales, Table 10), there was no effect of parent gender: *F*(2, 229) = 0.90, *p* = .407; Wilk's  $\Lambda$  = 0.99, partial  $\eta^2$  = .01 ( $\eta^2$  is a measure of effect size, where values around .02 are considered small, .13 medium, and .26 large; Cohen, 1988). At Time 2 (with four subscales), there was a significant overall effect of parent gender: *F*(4, 226) = 4.89, *p* = .001; Wilk's  $\Lambda$  = 0.92, partial  $\eta^2$  = .08. Post hoc tests revealed that fathers scored higher than mothers on rough-and-tumble play (partial  $\eta^2$  = .02), whereas mothers scored higher on modeling (partial  $\eta^2$  = .02). At Time 3 (with six subscales), there was a significant overall effect of parent gender: *F*(6, 182) = 10.27, *p* < .001; Wilk's  $\Lambda$  = 0.75, partial  $\eta^2$  = .25. Post

TABLE 9  
Differences (Dependent *t*-tests) in Parenting Behavior Between Fathers and Mothers

Scale	Mothers		Fathers		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Time 1					
CPB					
Self-rated	3.39	0.59	3.46	0.63	-1.07
Observed	2.19	0.38	2.17	0.41	0.49
OP					
Self-rated	2.40	0.43	2.39	0.43	0.09
Observed	1.97	0.40	1.86	0.34	2.88**
WA					
Self-rated	4.48	0.31	4.42	0.38	5.65***
Observed	3.29	0.49	3.15	0.57	2.37*
Time 2					
CPB					
Self-rated	3.26	0.52	3.33	0.49	-1.32
Observed	2.36	0.39	2.42	0.47	-1.45
OP					
Self-rated	2.46	0.50	2.43	0.45	0.60
Observed	1.67	0.35	1.53	0.31	4.10***
WA					
Self-rated	4.57	0.26	4.31	0.34	7.26***
Observed	3.32	0.47	3.13	0.47	3.40**
Time 3					
CPB					
Self-rated	3.15	0.52	3.27	0.43	-2.48*
Observed	1.89	0.25	1.92	0.28	-1.04
OP					
Self-rated	2.68	0.54	2.62	0.51	.89
Observed	1.41	0.13	1.37	0.13	2.46*
WA					
Self-rated	4.47	0.32	4.17	0.38	6.58***
Observed	2.78	0.26	2.68	0.23	3.01**

Note. OP = Overprotection, WA = Warmth.  
\*\*\**p* < .001. \*\**p* < .01. \**p* < .05.

hoc tests revealed that fathers scored higher than mothers on rough-and-tumble play (partial  $\eta^2 = .10$ ), and higher on competition (partial  $\eta^2 = .11$ ).

We also conducted a MANOVA on observed CPB at Time 3, because we separately coded a physical and verbal component of CPB. There was a significant overall effect of parent gender:  $F(2, 239) = 11.29, p < .001$ ; Wilk's  $\Lambda = 0.91$ , partial  $\eta^2 = .09$ . Post hoc tests revealed that fathers scored higher than mothers on physical CPB:  $F(1,240) = 8.14, p = .005$ , partial  $\eta^2 = .03$ , but not on verbal CPB,  $F(1,240) = 1.20, p = .274$ , partial  $\eta^2 = .01$ .

TABLE 10  
Differences on the Questionnaire Scales of Challenging Parenting Behavior between Fathers and Mothers

Scale	Mothers		Fathers		F
	M	SD	M	SD	
Time 1					
Teasing/RTP	3.35	0.72	3.35	0.72	0.00
Social daring	3.47	0.81	3.61	0.81	1.66
Time 2					
Teasing	3.20	0.64	3.28	0.61	0.96
RTP	3.38	0.72	3.58	0.63	5.16*
Social daring	3.66	0.68	3.70	0.65	0.15
Challenging modeling	2.78	0.65	2.58	0.66	4.92*
Time 3					
Teasing	2.98	0.78	3.15	0.72	2.48
RTP	3.70	0.80	4.17	0.58	21.92***
Enc. of risk taking	3.51	0.68	3.54	0.58	0.10
Social daring	3.11	0.54	3.17	0.48	0.80
Competition	2.52	0.75	3.01	0.67	22.01***
Challenging modeling	2.98	0.71	2.93	0.65	0.21

Note. RTP = rough-and-tumble play; Enc. = encouragement.

\*\*\* $p < .001$ . \* $p < .05$ .

### Child motor development and parents' CPB

Children's gross motor development was significantly positively related to observed CPB of fathers at Time 1, and of mothers at Time 2 and 3, and to self-rated CPB of fathers at Time 2 (Table 11).

## DISCUSSION

The aim of the present study was to assess, define, and substantiate the construct of CPB, to evaluate a newly developed questionnaire and observational measures to assess CPB, and to address several substantive issues regarding fathers' and mothers' CPB toward their child.

Methodological results indicated satisfactory psychometric properties of the questionnaire and observational tasks assessing CPB. The questionnaire scale of CPB showed good internal consistency on each child age for both parents. The final subscales were also reliable, except paternal social daring at Time 3. Observational assessment of CPB also showed good internal consistency across tasks, despite the different contexts in which parenting was assessed, involving free play as well as structured tasks. Hence, the physical aspects of CPB, such as rough-and-tumble play, and the socio-emotional aspects, such as social daring, seem to form a coherent construct. While much research stressed the physical component of fathers' CPB (e.g., Flanders et al., 2010), the current

study suggests that it may be meaningful to broaden the construct to include socio-emotional aspects of CPB (see Paquette, 2004; Paquette & Bigras, 2012). Reliability analyses on the questionnaires also suggested that CPB differentiates with child age, with teasing and rough-and-tumble play going together at 4 months, and separating beyond that age. In addition, encouragement of risk taking and competition appear to become distinguishable as subcomponents of CPB in toddlerhood.

The structure of subcomponents of CPB differentiating with age was confirmed by confirmatory factor analyses, which yielded fitting models for the questionnaires at 1 year and 2.5 year. This shows that the developed scales all loaded on a single CPB factor. Moreover, factor structure was equivalent for fathers and mothers, and factor loadings were similar across parents. Although the structure of CPB has not been previously studied, other studies have found invariance of factor structure and loadings for other parenting dimensions (Van Leeuwen & Vermulst, 2004). Theoretically, this finding supports Fagan et al.'s (2014) notion on the similarity of fathers' and mothers parenting constructs, at least for CPB. The significant convergence we found between questionnaire and observational assessment of CPB is impressive given the modest correlations usually found between these methods of assessment (e.g., Hawes & Dadds, 2006; Majdandžić, Van den Boom, & Heesbeen, 2008). Thus, the different situations in which CPB was observed (at home and in the lab; structured and unstructured) and which formed a coherent construct showed overlap with both fathers' and mothers' self-reported CPB. Of note, overlap between self-rated and observed parenting was lower for overprotection and warmth.

Evidence for divergent validity was provided by strong negative correlations of both parents' CPB with overprotection in infancy, in line with the conceptualization of overprotection as exaggerated worry and concern for the child's safety, and CPB as encouragement of risk taking and pushing limits. In toddlerhood CPB and overprotection showed weaker correlations, suggesting that these constructs become more independent with age. Notably, parents showing more CPB were generally also warmer, suggesting that CPB is a positive aspect of parenting (e.g., Paquette, 2004). In conclusion, methodologically, this study provides initial evidence for validity of CPB and for reliability of the questionnaire and observational measures to assess it in early childhood.

Theoretical results showed evidence for stability of parenting behavior already in early childhood, a period characterized by much developmental change. Not surprisingly, self-ratings of parenting were more stable than observations, in line with the bias inherent in using the same informant repeatedly (Holden & Miller, 1999). Stability was most consistently shown for CPB, suggesting that the novel concept of CPB is a relatively stable parenting trait from very early in the parent-child relationship. The lack of stability for observed warmth and overprotection from infancy to toddlerhood

TABLE 11  
Correlations between Child Motor Development and Challenging Parenting Behavior

Scale	Mothers		Fathers	
	Questionnaires	Observations	Questionnaires	Observations
CPB Time 1	.15	.17+	.08	.24**
Time 2	.20+	.24**	.25*	.13
Time 3	.18+	.19*	-.07	.06

\*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .

was contrary to the high stability of self-ratings of these dimensions and to the moderate stability found for observed CPB. This may be due to the somewhat lower reliability of observed warmth and overprotection in toddlerhood; both interobserver reliability and internal consistency, though sufficient, were lower than for CPB. This suggests that these parenting behaviors are more variable and more difficult to capture with toddlers in observational settings. Alternatively, parental expressed warmth and overprotection toward their toddler may be more strongly influenced by the child's temperament (Kiff, Lengua, & Zalewski, 2011) or behavior in the situations.

The finding of correspondence in both self-rated and observed CPB between the father and mother of a child is in line with the positive associations between couples found in studies on assortative mating (Luo & Klohnen, 2005; Watson et al., 2004). Notably, interparental correspondence was also found for overprotection (except at Time 3), but correspondence was low for warmth. Besides assortative mating, another explanation may be that parents adjust their parenting toward each other. That is, through supportive coparenting (Majdandžić, De Vente, Feinberg, Aktar, & Bögels, 2012), parents may learn from each other's example, instruction, and feedback. A third explanation is that the child induces a certain level of CPB from her parents ("I'm scared, be careful with me" versus "I like this, hold me higher!"), as the relationship between child's temperament and parenting is bidirectional (Kiff et al., 2011). In line with this, there was some evidence that children with better motor development had parents who were more challenging. Again, the causal direction is unknown, and parents' higher CPB may have resulted in higher motor development in their child (c.f. Pellegrini & Smith, 1998 on the functions of physical play).

Contrary to expectations, there was little evidence of interparental differences in levels of CPB on a global level, that is, assessing the total CPB construct. Fathers did not show more CPB than mothers in early and late infancy. Given evidence that parent-child physical play peaks at preschool age (Leavell, Tamis-LeMonda, Ruble, Zosuls, & Cabrera, 2012) and evidence on father-mother differences in physical play (Paquette, 2004), it is likely that the extent of interparental differences in CPB increases in early childhood, which was supported by our finding that fathers rated themselves higher on CPB in toddlerhood. In line with this, when differences were tested on the subscales of the questionnaires, fathers differed progressively more from mothers with child age, with increasing effect sizes and on more scales: not at 4 months, on rough-and-tumble play at 1 year and 2.5 years, and additionally on competition at 2.5 years. Interestingly, mothers rated themselves higher on challenging modeling at 1 year. When observed physical and verbal CPB were investigated separately in toddlerhood, fathers scored higher on physical, but not verbal, CPB than mothers, supporting previous evidence that physical play is a specific behavior in which fathers engage more than mothers (e.g., Carson et al., 1993). Thus, our results suggest that mother-father differences in CPB are absent in early infancy, begin to emerge in late infancy in the form of rough-and-tumble play, and are observable in toddlerhood in physical and self-rated CPB.

Interparental differences in overprotection and warmth were observable already in infancy, with mothers demonstrating more overprotection and warmth than fathers. This is in line with previous research reporting more warmth, sensitivity, and protectiveness in mothers than fathers, although some studies found no differences (reviewed in Lamb & Lewis, 2010; and in Möller et al., 2013). Surprisingly, whereas differences in warmth were found using both methods of assessment despite low measurement convergence, differences in overprotection were found using observations but not questionnaires. This suggests that these methods of assessment tap somewhat different constructs, in line with

the modest measurement convergence. Alternatively, mothers do show more overprotection than fathers in interaction with their child, but are less inclined than fathers to perceive their own behavior as overprotective and report so on self-ratings.

Overall, our study showed that as regards CPB, fathers' and mothers' parenting is highly similar in early childhood. The psychometric properties of CPB and its factor structure are the same for both parents; its divergent validity with overprotection and warmth and its stability are similar for fathers and mothers; couples' CPB is significantly associated; and mean level differences show only small to medium effects emerging in toddlerhood and for specific components of CPB. This supports Fagan et al.'s (2014) notion that parenting constructs are the same for fathers and mothers. Thus, while the development of the CPB construct was inspired by models claiming a different parenting role for fathers (Bögels & Perotti, 2011; Bögels & Phares, 2008; Paquette, 2004), the construct was tested in both fathers and mothers, and we conclude that the nature of this construct does not differ for fathers and mothers in early childhood. Whether the *effects* of CPB on child development differ for fathers and mothers, for which there is some initial evidence (Majdandžić et al., 2014), should be further studied in future research.

A limitation of the current study is that fathers' and mothers' parenting behavior was observed in the same contexts. On the one hand, this enabled exploring interparental differences across (a wide range of) identical situations. On the other hand, the use of prespecified structured and free play tasks impeded the possibility to quantify the amount of CPB that fathers and mothers exhibit in daily life. As suggested by evidence from studies using naturalistic observations or time diaries (Pleck, 2010) on physical play, fathers' display of CPB during daily life may be more frequent than mothers', whereas this difference may be reduced when both parents are observed in structured situations. Hence, the small interparental mean level differences found in our study may be an underestimation of the actual difference. When observing CPB in more naturalistic contexts, future studies should also investigate which aspects of CPB fathers and mothers show in which contexts and under which conditions.

Another limitation of the study was that the sample was rather homogeneous with respect to socioeconomic status and race. Although most parenting models are based on similar 'weird' samples (Western, Educated, Industrialized, Rich, and Democratic countries; Henrich, Heine, & Norenzayan, 2010), it is theoretically relevant to assess the construct in more collectivistic cultures, in view of findings that fathers in such cultures display lower levels of physical play (see Paquette, 2004), and of suggestions that this is because such cultures place less value on gaining assertiveness and competition skills (Paquette, 2004). Thus, culture may affect the role and occurrence of CPB and this needs to be addressed in future research. Likewise, the relatively high socioeconomic status of our sample necessitates investigating the construct of CPB in lower educated samples, which may hold less egalitarian gender-role attitudes (Dryler, 1998), so that fathers and mothers may show larger differences in parenting behavior.

We did not include ratings of child behavior, apart from the child's gross motor development. Including child behavior is valuable in various respects. On a broader level, this allows for exploring transactional processes, namely the effects of CPB on child socio-emotional development, in particular child anxiety (Bögels & Phares, 2008; Majdandžić et al., 2014), and of child behavior on parents' CPB (the results on gross motor development were suggestive of such transactional effects). This relates to another issue worth investigating in future research: The goodness of fit between parents' CPB and the child's temperament. For instance, what level of CPB fits children with different levels of fearful

temperament? On a more fine-grained level, the behavior of the child in the observed situation may affect parental CPB, but is also indicative of how this CPB is perceived and experienced by the child. While we intentionally did not incorporate child behavior in our observational measures of CPB to obtain a more objective measure of parental CPB as the “challenging context” for that particular child, such an approach would allow to assess the quality of CPB (e.g., Fletcher et al., 2013). A way to study this would be to code parent–child mutuality in a CPB context (e.g., the Parent–Child Interaction System is a coding system that can assess mutuality; Deater-Deckard & O’Connor, 2000). Thus, after establishing adequate measurement and validity of CPB, a next step in research on CPB would be to include child behavior.

In conclusion, this study demonstrates that the novel construct of CPB can be meaningfully assessed in parents of infants and toddlers. Results on factor structure, stability, interparental correspondence, and similarities in levels of CPB between fathers and mothers substantiate the construct, and suggest that in infancy and toddlerhood, CPB is highly similar for fathers and mothers. Interparental differences that appear to emerge pertain to physical aspects of CPB, which fathers seem to do progressively more than mothers. This provides support for theoretical models advocating the development of parenting measures based on fathers’ parenting role, which should also be assessed in mothers. So far, two studies found support for the functional relevance of CPB, demonstrating that fathers’ CPB negatively affects child anxiety (Majdandžić et al., 2014; Möller et al., 2014). Thus, assessment of CPB and its role in child socio-emotional development is an important area for future research.

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## APPENDIX A

## Scales and Items of the CPB-0 for Parents of 3 to 11-Month-Old Children (Time 1)

	Item
Teasing/Rough-and-tumble play (10)	
I sometimes hold a toy just out of reach of my child so that he/she has to exert himself/herself in order to grasp it.	1
I sometimes splash my child with water when he/she is in the bath.	3
When I have my child on my lap, I play games with him/her, such as giddy-up or row your boat.	4
I enjoy tickling my child.	6
When my child is lying on his/her belly, I sometimes roll him/her on his/her back, just for fun.	8
I sometimes play games with my child in which I exaggerate what my child does, such as making louder noises or opening my mouth wider.	9

## Appendix A (Continued)

	<i>Item</i>
When I am holding my child, I sometimes spin around for fun or rock him/her wildly back and forth.	11
I sometimes pretend to let my child fall in order to make him/her laugh.	12
I almost never play rough and rowdy games with my child. [reversed]	14R
I sometimes play a game with my child in which I lift him/her high above my head.	16
<b>Social Daring (7)</b>	
I sometimes put my child on unfamiliar peoples' laps.	2
I prefer not to let unfamiliar people make contact with my child, by looking into the stroller, for instance. [reversed]	5R
I never leave my child at day care or with a sitter. [reversed]	7R
I let my child spend the night with family.	10
I let my child sit on unfamiliar peoples' laps.	13
I let my child spend the night with friends/acquaintances.	15
I would rather not let unfamiliar people tickle my child. [reversed]	17R

## APPENDIX B

## Scales and Items of the CPB-1 for Parents of 12 to 23-Month-Old Children (Time 2)

	<i>Item</i>
<b>Teasing (10)</b>	
If my child cannot reach something, I immediately hand it to him/her. [reversed]	1R
When my child is lying on his/her belly, I sometimes roll him/her on his/her back, just for fun.	5
I frequently play peek-a-boo with my child.	9
I almost never tease my child for fun. [reversed]	13R
I sometimes hold a toy just out of reach of my child so that he/she has to make an effort to grasp it.	15
I play little tricks on my child.	19
When my child wants to grab something, I sometimes grab it just before him/her, for fun.	22
As a prank, I sometimes scare my child, for example by popping up unexpectedly.	26
I sometimes splash my child with water when he/she is in the bath.	31
I sometimes pretend to drop my child as a game.	35
<b>Rough-and-tumble play (11)</b>	
When I am holding my child, I sometimes spin around for fun, or rock him/her wildly back and forth.	2
I enjoy tickling my child.	6
When I have my child on my lap, I play games with him/her, such as giddy-up or row your boat.	10
I go on the merry-go-round or on the swing together with my child.	14
I sometimes throw my child into the air and catch him/her.	16
I frequently horse around (play boisterously) with my child.	20
I sometimes play a game with my child in which I lift him/her high above my head.	23
I carry my child on my shoulders without holding his/her hands.	27
I almost never play rough and rowdy games with my child. [reversed]	30R
I go down the slide with my child.	32
I challenge my child to races, such as who can crawl or walk the fastest.	36
<b>Social Daring (8)</b>	
I let my child spend the night with family.	3
I prefer not to let unfamiliar people tickle my child. [reversed]	7R
I prefer not to let unfamiliar people make contact with my child, by looking into the stroller, for instance. [reversed]	11R
I let my child wave at other people.	17

Appendix B (Continued)

	<i>Item</i>
If my child walks/crawls to an unfamiliar person, I stop him/her. [reversed]	21R
I let my child sit on unfamiliar peoples' laps.	24
I let my child spend the night with friends/acquaintances.	28
I sometimes put my child on unfamiliar peoples' laps.	33
<b>Modeling (7)</b>	
My child sometimes sees me tease others.	4
My child sometimes sees me horsing around (play boisterously) with others.	8
I show my child that I take risks.	12
My child often sees me approach unfamiliar people.	18
I show my child that I'm friendly and cordial toward other people.	25
I show my child how I stand up for myself.	29
My child regularly sees me in situations in which I try to win games and competitions.	34

APPENDIX C

Scales and Items of the CPB2-3 for Parents of 2 to 3-Year-Old Children (Time 3)

	<i>Item</i>
<b>Teasing (6)</b>	
I play little tricks on my child.	1
In the swimming pool, I sometimes put my child under water.	8
I almost never pull my child's leg. [reversed]	15R
I regularly tease my child for fun.	22
As a prank, I sometimes scare my child for fun, for example by popping up unexpectedly.	29
As a prank, I pretend that I am going to eat my child's sweets.	34
<b>Rough-and-tumble play (6)</b>	
I horse around (play boisterously) with my child.	2
I almost never play rough and rowdy games with my child. [reversed]	9R
I sometimes play a game with my child in which I spin him/her around.	16
I sometimes throw my child into the air and catch him/her.	23
I enjoy tickling my child.	30
I like to dance wildly with my child.	35
<b>Encouragement of risk taking (5)</b>	
I encourage my child to do exciting things by him/herself, like gliding on a big slide.	3
When my child finds something scary, I encourage him/her to carry on regardless.	10
If I see something that is new or exciting to my child, I take him/her to go and look at it at once.	17
When bathing my child, I encourage him/her to duck his/her head under water.	24
At the playground, I encourage my child to try all playground equipment.	31
<b>Social Daring (10)</b>	
When my child comes to me because he/she is having a minor quarrel, I make him/her sort it out by him/herself.	4
I let my child shake hands with strangers.	5
I let my child approach other children him/herself to ask if they can play together.	11
I encourage my child to say no if s/he doesn't want something.	12
I place my child in the center of attention.	18
When my child wants to play on the see-saw or swing but another child is playing, I let him/her ask for him/herself if he/she may go on it.	19
I let my child play alone at a friend.	25
I encourage my child to stand up for him/herself.	26
I let my child sing a song or dance before an audience.	32

## Appendix C (Continued)

	<i>Item</i>
If another child snatches something from my child, I encourage him/her to take it back.	36
Competition (4)	
When I play tag with my child, I make myself hard to catch.	6
I encourage my child to be the best.	13
I challenge my child to contests, for example running races.	20
I encourage my child to compete against other children.	27
Modeling (6)	
I show my child how I stand up for myself.	7
My child often sees me approach unfamiliar people.	14
My child sometimes sees me tease others.	21
My child regularly sees me in situations in which I try to win games and competitions.	28
My child sometimes sees me horsing around (play boisterously) with others.	33
I show my child that I take risks.	37