

# *The structure of challenging parenting behavior and associations with anxiety in Dutch and Australian children*

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### **Abstract**

**Objective:** Challenging parenting behavior (CPB), a novel construct involving active physical and verbal behaviors that encourage children to push their limits, has been identified as a potential buffer against child anxiety. This study aimed to 1) evaluate the measurement invariance of the Challenging Parenting Behavior Questionnaire (CPBQ4-6) across Dutch and Australian mothers and fathers of preschoolers; 2) examine differences in levels of CPB across mothers and fathers, and across countries; 3) examine whether parents' CPB predicts less child anxiety symptoms and disorders.

**Methods:** Participants were 312 families, 146 Dutch and 166 Australian, with their 3 to 4-year-old child (55.8% girls). Fathers' and mothers' CPB was measured using the CPBQ4-6, child anxiety symptoms and presence of anxiety disorders were assessed using maternal reports.

**Results:** Multigroup confirmatory factor analyses revealed equivalence of factor structure and factor loadings (all significant) of the CPBQ4-6 across mothers and fathers, and countries. Evidence of partial scalar invariance indicated that the groups differed on some subscales of the CPBQ4-6. Australian mothers scored lower on the CPB factor than Australian fathers and Dutch parents. Structural equation models showed that CPB predicted fewer child anxiety symptoms and anxiety disorders for all groups.

**Conclusion:** The study confirms that the CPBQ4-6 is appropriate for use with Dutch and Australian parents of pre-school aged children, and identifies CPB as a multifaceted and coherent construct. The negative relations between CPB and child anxiety suggest that CPB has a protective role in childhood anxiety, and is important to examine in future research and interventions.

*Keywords:* Challenging parenting behavior, fathers, measurement invariance, child anxiety.

## The Structure of Challenging Parenting Behavior and Associations with Anxiety in Dutch and Australian Children

Childhood anxiety disorders are chronic, debilitating, and often persist into adulthood (Merikangas et al., 2010). The chronicity of these disorders in addition to their accumulating personal, social, and economic impact (Bodden, Dirksen, & Bögels, 2008; Zubrick, Silburn, Burton, & Blair, 1999) emphasizes the need to continue to develop our understanding of the respective factors involved in their etiology and maintenance (Pahl, Barrett, & Gullo, 2012). Existing research has established a relationship between parenting behaviors and the development and maintenance of childhood anxiety disorders (Creswell, Murray, Stacey, & Cooper, 2011), with findings often highlighting the importance of parental overcontrol and rejection (McLeod, Wood, & Weisz, 2007; Murray, Creswell, & Cooper, 2009; Rapee, Schniering, & Hudson, 2009). The majority of this research has focused primarily on the parenting behavior of mothers, making it difficult to examine the differential effect of parental sex (Bögels & Phares, 2008; Creswell et al., 2011). Given that paternal overinvolvement and overcontrol have also been associated with child anxiety (e.g. Bögels, Bamelis, & van der Bruggen, 2008; Greco & Morris, 2002; Hudson & Rapee, 2002; Möller, Nikolić, Majdandžić, & Bögels, 2016), further research is required to examine the role of fathers, as both maternal and paternal parenting behaviors may contribute to the intergenerational transmission of anxiety (Möller et al., 2016).

Whilst it is important to examine maladaptive parenting behaviors that may act as risk factors in the development of childhood anxiety disorders, it is just as pertinent to examine protective parenting behaviors. One such factor that may act as a buffer against early anxiety is *challenging parenting behavior* (CPB; Majdandžić, de Vente, & Bögels, 2016). Through this behavior, parents, particularly fathers, are suggested to play an important role by encouraging their children to take risks, practice social assertion, and explore unfamiliar

situations with confidence (Bögels & Perotti, 2011; Bögels & Phares, 2008). CPB can include physical play (particularly rough-and-tumble-play), encouraging children to push their limits through exposure to safe risks, giving the child a fright, letting the child lose a game, encouraging the child to be assertive, and modeling of challenging behavior by the parent (Majdandžić et al., 2016). Challenging the child's behavior may have a particular influence on development, preparing the child to interact with the world outside the family (Bögels & Perotti, 2011; Bögels & Phares, 2008). This exposure to safe risk environments enables children to be braver in unfamiliar situations as well as stand up for themselves, which in turn fosters the child's confidence (Paquette, 2004). If exposure to small risks such as rough-and-tumble play benefits the child, fathers who do not encourage these interactions may increase the child's risk for developing anxiety (Bögels & Phares, 2008).

Whilst there is theoretical support for CPB (Bögels & Perotti, 2011; Bögels & Phares, 2008), a growing body of research has begun to empirically examine this novel parenting construct (see Lazarus et al., 2016; Majdandžić, Möller, de Vente, Bögels, & van den Boom, 2014; Möller, Majdandžić, & Bögels, 2014). In the earliest study to empirically examine this construct, Majdandžić et al. (2014) measured maternal and paternal CPB via observation and children's (siblings aged 2 and 4 years, respectively) social anxiety was observed at two time-points, 6 months apart. For the older preschool-aged children, Majdandžić et al. (2014) found more paternal CPB to be associated with decreases in social anxiety, whereas more maternal CPB was associated with an increase in child social anxiety 6 months later. When examining this construct in 1-year-old infants, Möller et al. (2014) utilized parent-report measures of CPB and infant temperamental fear and found that paternal, but not maternal, CPB was associated with less infant anxiety. In an attempt to replicate and extend these findings, Lazarus et al. (2016) examined the relationship between parent-reported CPB and maternal-reported child anxiety at both the symptom *and* disorder level in 3- to 4-year-olds. Mothers'

and fathers' CPB were *both* associated with lower report of child anxiety at the symptom level. Whilst at the disorder level, only mothers' CPB was found to predict decreased risk for clinical child anxiety diagnosis.

There are several plausible explanations for the disparate findings amongst studies examining CPB and its relation with child anxiety. One explanation is that these studies utilized differing measures and methodology for the assessment of childhood anxiety; social anxiety measured via observation (Majdandžić et al., 2014), mother and father report of infant temperament (Möller et al., 2014), and maternal-only report of child anxiety symptoms through both questionnaire and structured diagnostic interviews (Lazarus et al., 2016). Second, these studies utilized different measures to assess the CPB construct. That is, Lazarus et al. (2016) and Möller et al. (2014) utilized differing age-adapted versions of the Challenging Parenting Behavior Questionnaire (CPBQ4-6; Majdandžić, de Vente, & Bögels, 2010), a version designed for 4-6 year olds and one for 1-year-olds respectively, whereas Majdandžić et al. (2014) assessed CPB via observation through a set of structured tasks. Whilst the CPB scale used by Möller et al. (2014) has recently been psychometrically validated and displayed modest and significant convergence with observational measures of CPB (see Majdandžić et al., 2016 for a full discussion), Lazarus et al. (2016) utilized the English translation of a newly developed Dutch questionnaire (CPBQ4-6; Majdandžić et al., 2010), yet to be psychometrically validated. Lastly, these studies assessed children from different countries (The Netherlands and Australia) and at diverse stages of development (i.e. infancy: (Möller et al., 2014); toddlerhood age: (Majdandžić et al., 2014); and preschool age: (Lazarus et al., 2016; Majdandžić et al., 2014).

Findings across studies also vary with regards to the differences in levels of CPB between fathers and mothers. Möller et al. (2014) found no differences between fathers and mother in levels of self-reported CPB towards their 1-year-old infant. In the observational

study of Majdandžić et al. (2014), fathers were significantly more challenging towards their 2-year-old child than mothers but equally challenging towards their 4-year-old. Lazarus et al. (2016) reported higher levels of fathers' self-rated CPB compared to mothers' CPB towards their preschooler. The longitudinal study of Majdandžić et al. (2016) on CPB in early childhood revealed no differences between fathers and mothers in CPB in infancy (at 4 months and 1 year) using self-rated and observational measures of CPB, whereas in toddlerhood (at 2.5 years), fathers rated themselves higher on CPB than mothers. At the level of subcomponents of CPB, this study showed evidence of fathers scoring higher than mothers specifically on physical play, starting in late infancy. Thus, these studies suggest that fathers and mothers are equally challenging to their child in infancy, but that fathers may show higher levels of CPB than mothers at preschool age and perhaps beyond.

A significant limitation of the work to date comparing mothers and fathers CPB, is that there is as yet only one study assessing the equivalence of this measure for mothers and fathers (Majdandžić et al., 2016). This study found equivalence of factor structure and factor loadings for fathers and mothers at 1 year and 2.5 years. It is unclear whether the factor structure of the measure is consistent across mothers and fathers beyond toddlerhood. Further, it is possible that the contradictory findings explained above could be indicative of cultural differences between Dutch and Australian families. We do not know whether the measure is equivalent across countries. For example, is CPB in the Netherlands and Australian conceptualized the same way, is the underlying construct the same, and finally, do the scores reflect the same degree of CPB for Dutch and Australian mothers and fathers? Thus, there is a need to assess the equivalence of this measure when used in different populations. Further, in order to be able to draw comparisons, it will be important to compare the CPB of parents of children at a similar stage of development, whilst also ensuring comparable measures are utilized for the assessment of childhood anxiety. These steps are

necessary prior to forming strong conclusions about the relationship of CPB towards childhood anxiety disorders and making inferences about differential parenting effects.

The aims of the current study were therefore: (1) to assess measurement invariance of the Challenging Parenting Behavior Questionnaire 4-6 year version (CPBQ4-6; Majdandžić et al., 2010) (a) across fathers and mothers, and (b) across Dutch versus Australian parents; (2) to assess whether levels of CPB differ (a) across fathers and mothers, and (b) across Dutch and Australian parents; and (3) to examine the predictive relations between parents' CPB and child anxiety symptoms and disorders, and whether these were equivalent across mothers and fathers, and across countries. We hypothesized (1) to find measurement equivalence across fathers and mothers, and across countries; (2) that fathers would rate themselves higher than mothers on CPB in both countries; and (3) that parents' CPB would predict fewer child anxiety symptoms and disorders.

## Methods

### Participants

Participants were 312 families, drawn from two countries and consisting of two Dutch samples (total  $n = 146$ ) and two Australian samples (total  $n = 166$ ).

**Dutch Sample.** Participants from the first Dutch sample were 103 couples who participated with their first child in the ongoing longitudinal study The Social Development of Children, on the antecedents of anxiety in young children (Aktar, Majdandžić, de Vente, & Bögels, 2013; de Vente, Majdandžić, Colonnaesi, & Bögels, 2011; Majdandžić et al., 2016).

Of the 151 families who started participation in the study at the prenatal measurement, 118 participated at the measurement occasion when the child was 4.5 years. For the current study, data on CPB of one or both parents (101 mothers and 100 fathers) were available for 103 children (59 girls and 44 boys),  $M$  age = 4.50 years,  $SD = 0.05$  (range 4.40 to 4.68).

Recruitment took place when couples were expecting their first child. Families were recruited through leaflets provided by midwives in Amsterdam and in cities within a range of 50

kilometers around it, at pregnancy courses, baby shops, and through advertisements in magazines and on websites on parenthood. The vast majority of parents were of Dutch origin (97% fathers; 94% mothers). Educational level was fairly high; for mothers,  $M = 7.02$ ,  $SD = 1.16$ , range 1 – 8 (on a scale from 1 – primary education, to 8: university); for fathers:  $M = 6.54$ ,  $SD = 1.61$ , range 2 – 8. Mothers' professional level was  $M = 8.69$ ,  $SD = 2.10$  (range 2 – 11), fathers':  $M = 8.12$ ,  $SD = 2.71$  (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). Mothers' mean age at the time of this study was 35.83 years,  $SD = 4.28$  and fathers' mean age was 38.84 years,  $SD = 5.53$ .

Participants of the second Dutch sample were drawn from a sample 172 families that participated in a study on anxiety in young children aged 4 to 7 years. These children had not been treated for anxiety in the past nor did they have any formal diagnosis. Children of 3-4 years ( $n = 43$ ; 23 girls and 20 boys) were selected for this study in view of comparability in age with the Australian sample. One child was 3 years old and 42 were 4 years (data to calculate exact age was not available). Data on CPB were available for 43 mothers and 42 fathers. Families were recruited by students through convenience sampling in the community, including relatives, local contacts, and schools. The majority of parents were of Dutch origin (mothers: 91%, fathers: 95%). Educational level of the parents was fairly high: mothers  $M = 6.37$ ,  $SD = 1.51$ , range 2 – 8; fathers:  $M = 6.21$ ,  $SD = 1.60$ , range 2 – 8 (on a scale from 1 – primary education, to 8: university). Mothers' mean age at the time of the study was 34.65 years,  $SD = 4.86$ , and fathers' mean age was 37.45 years,  $SD = 6.17$ . Thus, socioeconomic status of the parents of the Dutch samples was relatively high.

**Australian Sample.** Australian participants were obtained from two samples. For the first sample, data was obtained as part of the baseline assessments of a randomized control trial (RCT) of an intervention for behaviorally inhibited children. Participants included 164

preschool children (92 girls and 72 boys) ranging in age from 3.35 to 4.81 years and their mothers and fathers (Lazarus et al., 2016). For the second sample, data was obtained as part of a separate study that followed the same recruitment procedures used in the first Australian sample. Participants included 13 preschool children (9 girls and 4 boys) ranging in age from 3.28 to 4.64 years. The complete Australian sample consisted of 166 children (92 girls and 74 boys; 85 behaviorally inhibited, and 81 behaviorally uninhibited) for which data on CPB of one or both parents (161 mothers and 152 fathers) were available; *M* age of the children = 3.98 years, *SD* = 0.32 (range 3.28 to 4.67). Children were recruited via advertisements in a local parenting magazine and flyers distributed to local preschools. Two different advertisements were used, the first requested for ‘shy’ children, the second for ‘confident’ children. Children were selected for participation based on mothers’ ratings on the Approach subscale of the Short Temperament Scale for Children via telephone interviews (STSC; Sanson, Smart, Prior, Oberklaid, & Pedlow, 1994). The complete procedure is described in (Lazarus et al., 2016).

Most mothers described the family ethnicity as being of Oceanic ethnicity (74.3%), 14.2% as Asian, 6.8% European, 2.7% American, and 2.0% African. The majority of families (73.8%) were from middle to high-income families (annual income of AUD \$80,000 or greater) and 93.9% of children were from two-parent homes. Parents’ education levels were relatively high, with 76.1% of mothers and 63.1% of fathers having an undergraduate or postgraduate degree. Mothers’ mean age at the time of the study was 36.70 years, *SD* = 4.74, and fathers mean age at the time of the study was 39.17 years, *SD* = 5.61.

## Measures

**Challenging Parenting Behavior.** Parents’ CPB was assessed using the Challenging Parenting Behavior Questionnaire for parents of children from 4 to 6 years (CPBQ4-6; Majdandžić et al., 2010). This questionnaire 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 43 items, and seven subscales of CPB: teasing, rough-and-tumble play, encouragement of risk taking, social daring, encouragement of assertiveness, competition, and parental modeling of CPB. In addition to the subscales, a total score can be constructed for an overall measure of CPB. Parents were asked to rate statements about interactions with their child (e.g., 'If my child thinks that he/she can't do something, I encourage him/her to try again') on a 5-point Likert scale (1= *Not applicable*, 5= *Completely applicable*).

The original Dutch version was translated into English by MM. This translation was checked by the University of Amsterdam's translation office. Next, the translation was discussed with the Australian research team and was adjusted slightly. A back translation was carried out by HD, JH, and a bilingual Dutch-English volunteer, and was found to be satisfactorily similar to the original Dutch version.

Prior to the main analyses, internal consistency of the measures was examined separately for fathers and mothers of each country. Items with negative or low ( $< .10$ ) item-total correlation at the total scale or subscale level were removed. In each group, the same 4 items showed problematic item-total correlations, and these were removed (one of these items showed  $> .10$  item-total correlation in Dutch fathers, but  $< .03$  in Australian fathers and Dutch and Australian mothers). Following Majdandžić et al. (2016), social daring and encouragement of assertiveness were combined into one social daring scale. The resulting CPBQ4-6 contains 39 items, and consists of six subscales: teasing (6 items), rough-and-tumble play (6 items), encouragement of risk taking (6 items), social daring (9 items), competition (5 items) and modeling (7 items). The items are presented in Appendix A.

Reliability of the CPB total scale and subscales for Dutch and Australian parents is presented in Table 1. Internal consistency of the CPB total score was high for both fathers'

and mothers' self-ratings in both countries. Internal consistency of the subscales was acceptable to good. Evidence for validity of the CBPQ comes from a study using younger age versions, showing convergence with observations of CPB (Majdandžić et al., 2016).

[Insert Table 1 about here]

**Child Anxiety Symptoms.** Child anxiety symptoms were assessed using mothers' report on the Preschool Anxiety Scale (PAS; Spence, Rapee, McDonald, & Ingram, 2001) in the Australian sample, and on the Preschool Anxiety Scale – Revized (PAS-R; Edwards, Rapee, Kennedy, & Spence, 2010) in the Dutch samples. The PAS contains 28 items, and the PAS-R 30, reflecting areas broadly consistent with DSM-IV diagnostic categories; social anxiety, separation anxiety, generalized anxiety, obsessive-compulsive symptoms, and specific fears. An example item is “Has difficulty stopping him/herself from worrying”. The PAS has been found to have good construct validity, satisfactory internal consistency, and good test-retest reliability (Spence et al., 2001). The PAS-R has been found to have satisfactory internal consistency for all scales (Cronbach's  $\alpha > .70$ ) across English (Edwards et al., 2010) and Dutch translations (Broeren & Muris, 2008, 2009), as well as good construct validity and stability over time (see Edwards et al., 2010). Internal consistency for the PAS/PAS-R total score was excellent; in the Australian sample:  $\alpha = .94$ ; in the first Dutch sample .88, and in the second Dutch sample .93.

To enable comparison between the PAS and PAS-R, T-scores were calculated for total scores. T-scores for the PAS were computed using the norms provided by Spence (n.d.) based on a sample of Australian preschoolers ( $N = 1368$ ). There is currently no normative data for the PAS-R. Consequently, separate T-score distributions were developed by creating norms from the largest published sample of the PAS-R,  $N = 764$ ,  $M = 38.4$ , and  $SD = 19.0$  for mother report (see Edwards et al., 2010).

**Child Anxiety Disorders.** In each sample, the Anxiety Disorders Interview Schedule

for *DSM-IV* Parent Version (ADIS-P-IV; Silverman & Albano, 1996) was used with mothers to assess child anxiety disorders (in the first Dutch sample, fathers were also interviewed but not used in the current study; in the second Dutch sample 64% of interviews was conducted with mother, 31% with both the father and the mother, and 4% with the father). Interviews were conducted and diagnoses assigned by trained postgraduate students in psychology or clinical pedagogics. The ADIS-P-IV has excellent interrater agreement of kappa = 1.00 for an overall anxiety diagnosis and between kappa = .80 and kappa = .93 for specific anxiety diagnoses (Lyneham, Abbott, & Rapee, 2007). Reliability for the presence of a clinical anxiety disorder was excellent in the Australian sample (kappa = .95), and in the Dutch sample (kappa = 1.00). Diagnoses were only considered 'clinical' if the severity rating was four or greater, consistent with ADIS guidelines (Silverman & Albano, 1996).

### **Procedure**

**Dutch Sample.** For the first Dutch sample, ethical approval was obtained from the Department of Psychology of the University of Amsterdam and all participants provided written informed consent. Mothers and fathers participated in laboratory visits separately with their child, where several tasks were conducted (not used in the current study). Before the lab visit, parents received a set of questionnaires, including the CPBQ4-6 and the PAS-R, to be filled out at home individually and returned at the lab visit or by mail. ADIS interviews about the child were conducted by telephone separately with mothers and fathers (fathers' interviews were not used in the current study).

For the second Dutch sample, the ethical board of the Department of Child Development and Education of the University of Amsterdam approved the study and the participants provided written informed consent. Families were visited at their homes where ADIS interviews about themselves and their child were conducted. If one of the parents was not at home during the visit, they were revisited at a later time, or the interview was

conducted by phone. Parents were either sent questionnaires before the home visit, so they could be collected at that time; or the questionnaires were handed to the parents during the home visit, and then returned by post. The questionnaires package included, but was not limited to, the CPBQ4-6 and PAS-R reported in the current study.

**Australian Sample.** Macquarie University Ethics Committee approved all procedures prior to study start. Mothers provided consent for the family and were sent links to online questionnaires. For mothers, questionnaires included demographic information, the CPBQ4-6 and the PAS. For fathers, questionnaires included demographic information and the CPBQ4-6. ADIS-P-IV interviews were conducted with mothers during a 2-hour research session at Macquarie University (sample a) and by telephone (sample b). Participants also completed additional questionnaires as well as observational tasks (not presented here). It is noted that fathers were not requested to complete measures on childhood anxiety (PAS and ADIS-P-IV). As fathers were not required to attend the research session, questionnaire packages were restricted to reduce time constraints for fathers and to facilitate survey completion.

### **Data Analysis Plan**

The first aim of the study, to investigate measurement invariance of the CPBQ4-6 in Dutch and Australian parents, was explored using a series of multigroup confirmatory factor analyses (CFAs) using Mplus (Muthén & Muthén, 1998-2015). The CFAs were conducted at the subscale level, estimating the loadings of the six subscales on the latent CPB factor (see Majdandžić et al., 2016). To account for dependency between fathers and mothers, a two-factor model was specified, with one latent factor for mothers' CPB and one for fathers' CPB, each indicated by the six CPB subscales. The factors representing fathers' CPB and mothers' CPB were correlated, as were the residual factors of the corresponding subscales.

Measurement invariance was tested in three steps (e.g., see Milfont & Fischer, 2015). First, configural invariance analyses were done to examine the overall model fit and

significance of factor loadings for a multigroup model with no constraints across fathers and mothers, and across countries. Configural invariance establishes whether the basic model structure is invariant across groups, indicating that the reports of mothers and fathers from different countries conceptualize CPB in the same way. Second, metric equivalence was tested by constraining factor loadings of the scales to be equal across fathers and mothers, and across countries, and by comparing the fit of models with and without the constraints. Metric invariance indicates that the strength of the relations between the subscales and the underlying CPB construct is the same across groups. Third, scalar invariance was tested by also constraining intercepts, and comparing the fit of models with and without the constraints. Scalar invariance indicates that differences between individuals on observed scores (i.e., on the subscales) can be fully explained by differences between them on the underlying common factor scores (e.g., on CPB). Thus, if scalar invariance is met, Australian and Dutch fathers and mothers who obtain the same score on for example the subscale rough-and-tumble play would have the same score on the CPB common factor score.

In case constraints resulted in significantly decreased model fit, we also tested partial measurement invariance models by removing single constraints one by one, in order to examine for which factor loadings or intercepts the invariance constraints did not hold. Lastly, we investigated the second aim of our study, namely to test the significance of differences in levels of CPB between fathers and mothers, and between countries, by also constraining the common factor means to be equal and comparing model fit.

Models were fitted using maximum likelihood estimation. Model fit of the initial configural model was evaluated using the  $\chi^2$  measure of absolute fit, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). Cut-offs of  $CFI \geq .95$  and  $RMSEA \leq .05$  suggest good fit and cut-offs of  $CFI \geq .90$  and  $RMSEA \leq .08$  suggest adequate fit (Cheung & Rensvold, 2002; Hu & Bentler, 1998). Measurement invariance was evaluated

through chi-square difference tests and Expected Cross Validation Index (ECVI) differences (Browne & Cudeck, 1992). A significant chi-square difference and a significant ECVI difference indicate a notable decrease in approximate fit. In addition, current research suggests that a negative change in the CFI of  $\leq -.002$  and a positive change in the RMSEA of  $\geq .007$  are indicative of notable decrement in model fit (Sass, Schmitt, & Marsh, 2014).

The third aim of the study, to test the relationship between CPB and child anxiety, was achieved by including child anxiety in the final model and testing for a significant relationship with CPB. We conducted this analysis separately for anxiety symptoms and presence of an anxiety disorder. In addition, we tested whether regression coefficients of the relation between CPB and child anxiety were invariant across fathers and mothers, and across countries, by comparing the fit of models with and without equality constraints. For the model with presence of an anxiety disorder as dependent variable, a dichotomous variable, we used weighted least squares estimation.

## Results

### Preliminary Analyses

Of the entire sample of 312 families, 10.3% had missing values: 4 on presence of anxiety disorder, 6 on anxiety symptoms, 7 on maternal and 18 on paternal CPB. The 32 families with missing data did not differ from the other families on any of the study variables (i.e., CPB and its subscales, child anxiety, child gender, and age; all  $p > .05$ ). Missing data are handled in MPlus by full information maximum likelihood estimation (Muthén & Muthén, 1998-2015).

All continuous 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, & Osterlind, 2001). Skewness and kurtosis was  $< |2|$  for all measures.

To explore whether child gender should be controlled for, we tested whether boys and

girls differed on anxiety and on CPB, using independent sample *t*-tests. No significant child sex differences were found in child anxiety symptoms,  $t(304) = 0.38, p = .703$ , or presence of anxiety disorder,  $t(306) = 0.12, p = .903$ . Mothers showed no differences in CPB (or its subscales) towards sons or daughters. Fathers of sons showed more competition towards their child ( $M = 3.03, SD = 0.77$ ) than fathers of daughters ( $M = 2.84, SD = 0.77$ ),  $t(292) = 2.11, p = .036$ , but no differences on total CPB or other subscales were present. Because of the few differences (1 out of 16), child gender was not further addressed.

To explore whether age should be controlled for, correlations were calculated between child age and the study variables. Higher child age was related to higher CPB of mothers and fathers (both  $r_s = .24, p < .001$ ), and several of its subscales: teasing (mothers:  $r = .24, p < .001$ , fathers:  $r = .22, p < .001$ ), rough-and-tumble play (mothers:  $r = .14, p = .011$ , fathers:  $r = .25, p < .001$ ), social daring (mothers:  $r = .25, p < .001$ , fathers:  $r = .21, p < .001$ ), modeling (mothers and fathers:  $r = .18, p = .002$ ), and mothers' competition ( $r = .14, p = .012$ ). Child age was unrelated to presence of anxiety disorder ( $r = -.09, p = .127$ ), but higher child age was related to lower anxiety symptoms ( $r = -.17, p = .003$ ). These age effects suggested necessity for controlling for age. Therefore, all analyses were also conducted using age as a covariate. The results were highly similar to the analyses without correcting for age, and age was uncorrelated to the common CPB factors ( $r = .16$  for Dutch mothers,  $.16$  for Dutch fathers,  $.13$  for Australian mothers, and  $.10$  for Australian fathers, all  $p > .05$ ). Because the results were not affected by age, we report the results without using age as a covariate.

Descriptives and correlations of all raw study variables are presented in Tables 2 (Dutch parents) and 3 (Australian parents). Fathers' CPB was significantly positively correlated with mothers' CPB (total score and across subscales) in both countries, indicating that fathers and mothers of a child tended to cohere in their level of CPB. Correlations across subscales of CPB were high and significant for fathers and mothers in both countries,

indicative of high coherence among the scales. Correlations of CPB and its subscales with child anxiety symptoms showed low non-significant correlations for Dutch fathers, and low to modest correlations for Dutch mothers and Australian fathers and mothers. Almost all correlations between CPB and child anxiety were negative. Correlations of CPB with presence of anxiety disorder were low and mostly non-significant for Dutch parents, and low to modest for Australian parents. Notably, in the Australian sample, mothers' as well as fathers' rough-and-tumble play and risk taking were the only subscales significantly associated with both measures of child anxiety. The pattern of CPB-anxiety correlations for Dutch parents was less clear. For Dutch fathers, significant negative associations were only found between social daring and presence of anxiety disorders, whereas for Dutch mothers, significant negative associations were found for rough-and-tumble play, risk taking, social daring and modeling, but only with child anxiety symptoms.

[Insert Table 2 and 3 here]

### **Factor Structure and Measurement Invariance of CPB**

We tested measurement invariance of the CPBQ across fathers and mothers, and across countries in a series of CFA models. For all models, three residual factors were allowed to correlate (identical across groups and for all models) to improve model fit.

The initial two-factor configural model showed adequate fit across countries (Table 4), indicating that the basic model structure of CPB does not differ between parents and countries. Configural fit was also established by significant standard factor loadings of  $\geq .49$  ( $p < .001$ ) for all scales on the factor ( $M = .67$ ,  $SD = .08$ ). The nested metric invariance model, with equal loadings for mothers and fathers and across countries, showed a good overall fit according to CFI and RMSEA measures (Table 4). Evaluation of change in model fit gave contrasting results: on the one hand a significant increase in  $\chi^2$  ( $p = .023$ ) and a notable decrease in CFI compared to the unconstrained model, on the other hand a negligible

increase in RMSEA, and a non-significant change in ECVI (Table 4). Because two of these measures indicated acceptance of the model, and overall model fit of this model was good, we choose to accept the model, indicating equivalence of factor loadings across parents and countries. This means that we can be confident that the subscales of CPB hang together in the same way for mothers and fathers and for Australian and Dutch parents.

Next, we tested scalar invariance in a model nested within the metric invariance model, in which intercepts of the scales were constrained to be equal across fathers and mothers, and across countries. This scalar invariance model showed a significant increase in  $\chi^2$  ( $p < .001$ ), a notable decrement in CFI and RMSEA fit, and a significant change in ECVI (Table 4), indicating that intercepts were not equal across fathers and mothers and across countries. Subsequently, we examined *partial* scalar invariance by removing constraints on intercepts one by one, going forward and backward, until we achieved good fit (Table 4). The final model has six intercepts that could not be constrained to be equal across groups: Given their scores on the CPB factor, Dutch fathers score higher than expected on teasing and rough-and-tumble play, Dutch mothers score lower than expected on competition, Australian fathers score lower than expected on social daring and modeling, and Australian mothers score higher than expected on risk taking. Thus, the final model showed invariance of all factor loadings and some intercepts. So, although the strength of the relations between the subscales and the underlying CPB construct is the same across Dutch and Australian mothers and fathers, they score differently on some subscales relative to their level of CPB.

[Insert Table 4 about here]

### **Differences in Levels of CPB**

Differences in mean level of the CPB factor between fathers and mothers, and between countries were evaluated in Mplus using the nested model approach. That is, in the final model described above, we fixed the mean of the latent CPB factor (at 0) and its

variance (at 1) using one parent/country (e.g., Dutch fathers) as a reference, in order to test whether the other groups differed from the reference on this mean level of CPB. The results showed that the difference in mean level of CPB was not significant between Dutch fathers and mothers ( $d = .03$ ,  $SE = .124$ ,  $p = .804$ ), but Australian fathers scored higher than Australian mothers ( $d = .52$ ,  $SE = .117$ ,  $p < .001$ ). Dutch mothers scored significantly higher on CPB than Australian mothers ( $d = .48$ ,  $SE = .135$ ,  $p < .001$ ), but Dutch and Australian fathers did not differ in level of CPB ( $d = .01$ ,  $SE = .156$ ,  $p = .932$ ). Thus, Australian mothers seem to express lower levels of CPB than Australian fathers and Dutch fathers and mothers.

### **Prediction of Child Anxiety Symptoms by CPB**

The third aim of the study, to test the hypothesized negative relation between CPB and child anxiety, especially for fathers, was analysed by extending the structural equation model with the dependent variable child anxiety symptoms. Predictive relations of fathers' and mothers' CPB to child anxiety symptoms were simultaneously estimated (i.e., as two predictors) in the multigroup model with the two countries. The initial predictive model showed good fit ( $\chi^2(126) = 190.28$ ,  $CFI = .961$ ,  $RMSEA = .057$ ), and revealed that only CPB of Dutch mothers was significantly related to less child anxiety symptoms ( $B = -2.29$ ,  $SE = 0.84$ ,  $p = .006$ , Dutch fathers:  $B = 0.18$ ,  $SE = 1.10$ ,  $p = .866$ , Australian mothers:  $B = -2.23$ ,  $SE = 1.50$ ,  $p = .136$ , Australian fathers:  $B = -1.37$ ,  $SE = 1.47$ ,  $p = .352$ ). Next, we tested whether regression coefficients could be constrained to be equal across parent gender and countries. This model fitted the data well ( $\chi^2(129) = 192.90$ ,  $CFI = .961$ ,  $RMSEA = .056$ ). Model comparison revealed no significant increase in  $\chi^2$  ( $p = .455$ ) compared to the initial predictive model, and no change in ECVI ( $\Delta ECVI = -.011$ , 90 CI:  $-.010$ ,  $.015$ ). Thus, regression coefficients could be constrained to be equal across all four groups. The regression coefficient was negative and significant ( $B = -1.63$ ,  $SE = 0.41$ ,  $p < .001$ ). Thus, when tested as simultaneous predictors, fathers' and mothers' CPB predict significantly less child anxiety

symptoms, both in Australia and in the Netherlands.

### **Prediction of Presence of Child Anxiety Disorders by CPB**

The same approach was used to test predictive relations of fathers' and mothers' CPB with presence of child clinical anxiety diagnosis. The initial model, in which predictive paths for each of the four groups was freely estimated, showed good fit ( $\chi^2(48) = 60.35$ , CFI = .951, RMSEA = .041). In this model, only higher CPB of Australian mothers predicted smaller risk for child anxiety disorder, at trend level (B = -0.22, SE = 0.13,  $p = .098$ ; Australian fathers: B = -0.07, SE = 0.13,  $p = .587$ , Dutch mothers: B = -0.16, SE = 0.14,  $p = .237$ , Dutch fathers: B = -0.14, SE = 0.18,  $p = .455$ ). The model with regression coefficients constrained to be equal across parent gender and countries fitted the data well ( $\chi^2(44) = 49.75$ , CFI = .977, RMSEA = .029). The good fit of this model showed that the regression coefficient could be constrained to be equal across all four groups and was significantly negative (B = -0.15, SE = 0.05,  $p = .004$ ). Thus, the final model revealed that both Australian and Dutch fathers' and mothers' CPB predict a significantly smaller risk for child anxiety disorders.

### **Discussion**

The aims of this study were to: 1) evaluate the measurement invariance of the CPBQ4-6 across mothers and fathers, and across Dutch and Australian parents; 2) establish whether levels of CPB differed across mothers and fathers, and across countries; 3) examine whether parents' CPB predicted less child anxiety at both the symptom and disorder level. This is the first study to establish the measurement invariance of a measure of CPB across countries, and it was anticipated that, if invariant, results of this study would allow for the cross-cultural comparison of findings for the limited literature available in this area to date.

The results revealed equivalence of factor structure and factor loadings of the CPBQ4-6 across mothers and fathers, and across countries, and a pattern of significant

subscale-factor loadings for all groups. This demonstrates that the subscales of the CPBQ4-6 cohere well, and load meaningfully onto a single factor, regardless of parent sex or parent country. Further, there is no evidence that some scales have a stronger contribution to the latent CPB factor than others across mothers and fathers, and across countries. Thus, the subscales appear to reflect meaningful subcomponents of CPB. These results are in line with the equivalence of factor structure and factor loadings found across fathers and mothers at 1 and 2.5 years with earlier age versions of the CPBQ (Majdandžić et al., 2016). Our results extend the results of Majdandžić et al. (2016) in that we demonstrate equivalence of factor structure in 4-year-olds and across different countries in addition to fathers and mothers. This supports the notion of Fagan, Day, Lamb, and Cabrera (2014) that parenting constructs are similar for fathers and mothers; and this seems to hold also for CPB. In sum, these results are encouraging in that we can be confident about the factor structure of the CBPQ4-6 for use with fathers and mothers in different Western countries.

Subsequent analyses identified partial scalar invariance at the intercept level where six out of 24 intercepts could not be constrained to be equal across groups. Whilst the partial scalar invariance model showed good fit, the necessity to free six intercepts to achieve this model demonstrated that there are some important differences that may need to be explored in future studies. For example, whilst Dutch mothers' and Australian mothers' and fathers' scores on the teasing and rough-and-tumble play scales of the CPBQ4-6 may be considered invariant (allowing comparison of these intercepts across these three groups), Dutch fathers reported more rough-and-tumble play than the other groups of parents, relative to their total CPB. Likewise, Australian mothers endorsed greater encouragement of children's participation in taking risks, relative to their general CPB than the other three groups. Thus, these non-invariant parameters displayed some differential functioning across countries and across parent sex at the intercept level. Non-invariance of intercepts may be indicative of

potential measurement bias and suggests there may be cultural or parenting differences influencing the way parents respond to these subscales, and thus should be investigated in future studies using this measure.

In exploring differences in the mean level of the CPB factor between mothers and fathers and between countries, it was found that Australian mothers reported lower levels of CPB than Australian fathers and Dutch parents. The effect sizes of these comparisons were of medium strength. We had no specific hypotheses regarding cultural differences and these preliminary results require confirmation through subsequent studies with a larger sample size. This result for Australian mothers could be interpreted within the context of the theoretical underpinnings of this parenting behavior whereby Bögels and Phares (2008) suggest that CPB is an important parenting behavior which may be more characteristic of fathers' parenting. However, this does not explain why Dutch mothers were found to be similar in their reporting of CPB to Dutch and Australian fathers. Whilst CPB is hypothesized to be particularly salient for fathers, mothers have also been found to engage in this type of parenting behavior (Lazarus et al., 2016; Majdandžić et al., 2016). Previous studies found equal levels of self-rated CPB for Dutch mothers and fathers of 1-year-olds (Möller et al., 2014), more observed CPB of Dutch fathers than mothers of 2- but not 4-year-olds (Majdandžić et al., 2014), equal observed and self-rated CPB of Dutch mothers and fathers of 4-month-olds and 1-year-olds, but more self-rated paternal than maternal CPB at 2.5 years old (Majdandžić et al., 2016). Together with the current results, these studies suggest that differences between Dutch fathers and mothers in CPB may be largest in toddlerhood, the age when physical play peaks (Leavell, Tamis-LeMonda, Ruble, Zosuls, & Cabrera, 2012). The finding that fathers of 3- to 4-year-olds show more CPB than mothers in Australia but not in the Netherlands may be due to smaller gender role differentiation in the Netherlands compared to other Western countries, as reflected by the Netherlands scoring lower (14) on

masculinity than Australia (61; Hofstede, Hofstede, & Minkov, 2010).

Apart from the structure and measurement of CPB, an important issue is the functional relevance of this novel construct. The initial models revealed that for child anxiety symptoms, only CPB from Dutch mothers was related to significantly less child anxiety, and for child anxiety disorders, a borderline significant relationship was found only for CPB from Australian mothers. However, constraining the regression coefficients to be equal resulted in increased power, and the final model, that fitted for all groups, revealed that at both the symptom and disorder level, CPB was related to significantly less child anxiety for Dutch and Australian mothers and fathers. These negative relations between CPB and clinical measures of child anxiety, irrespective of parent gender and country, illustrate the potential clinical relevance of CPB.

Accumulating research in this area supports the idea that CPB exhibited by the father may act as a protective mechanism, but the relationship for mothers is less clear. For example, the findings from studies discussed earlier by Möller et al. (2014) and Majdandžić et al. (2014) suggest that fathers' CPB is associated with less anxiety in both infants and 4-year-old children, whereas mothers' CPB may have a positive association such that greater CPB from mothers was associated with greater child anxiety. The findings of the current study partly point in the opposite direction for mothers, because the initial and final models show a significant negative association with child anxiety for mothers' CPB. This may be due to the fact that both mothers' CPB and child anxiety were obtained from maternal reports. For fathers' CPB, negative associations between CPB and child anxiety were found only in the final models when testing equivalence of regression coefficients across groups. The disparate results for the relations of mothers' CPB with child anxiety in the literature may be explained by differences in measures used (i.e., Majdandžić et al. 2014, used observations to assess CPB and child anxiety; Möller et al., 2014, used temperamental fear as an outcome measure),

or the developmental stage of the child (i.e., Möller et al.'s sample involved infants). The findings for fathers' CPB to-date are more clear-cut and suggest a negative association between paternal CPB and child anxiety in infancy, and, as confirmed in this study, at preschool age. Further research into this construct is warranted in order to enhance understanding of the interparental differences in mothers' and fathers' CPB and the relationship of CPB towards anxiety in offspring. Such efforts should take into account measurement method and age to unravel whether CPB holds different effects depending on developmental period of the child.

This study provides an important step forward in terms of identifying a measure of CPB that is appropriate for use with parents of pre-school aged children from The Netherlands and Australia, and potentially in other English-speaking countries. The results identified CPB as a multifaceted and coherent construct. Most importantly, this study provides further answers with respect to this parenting behavior and its protective role towards childhood anxiety. A clear strength of the current study was the consistency across the samples in the measures of anxiety and of CPB, as well as similarity in the developmental stage of the children. However, a number of limitations require attention. First, the cross-sectional design of the current study means that it is not possible to delineate cause and effect; whilst it is possible that greater CPB predicts less child anxiety, it is also possible that a child that is less anxious elicits more physical engagement and risky-stimulation from their parent. The only previous study using a longitudinal design found fathers' observed CPB to predict subsequent child social anxiety (Majdandžić et al., 2014), but did not explore the reverse direction. Second, an important limitation is the shared method variance from mothers. This study was conducted with pre-existing data, and unfortunately in the Australian samples only maternal report of child anxiety was obtained. Whilst child anxiety data was obtained from fathers in the Dutch samples, in order to achieve consistency in measures used

we also wished to have consistency of reporters and consequently chose to rely on mother-report of child anxiety. Future studies should try to obtain both maternal and paternal report of child anxiety. Third, the method of recruitment was not consistent across samples. The Australian study utilized an extreme-groups design to recruit children that were behaviorally inhibited and behaviorally uninhibited, whereas the Dutch samples were not selected. Findings should be interpreted in light of this inconsistency, as this may have contributed to some of the differences obtained, such as the lower report of CPB from Australian mothers. Due to the use of pre-existing data, consistency in recruitment could not be assured. Relatedly, because all samples included urban families from Western countries, generalizability to other cultures is limited. However, these limitations provide important pathways for future research. Fourth, there remains uncertainty as to why partial scalar invariance was obtained at the level of intercepts. Consequently, it would be valuable to examine the specific sub-components of CPB (e.g., teasing, risk-taking, rough-and-tumble-play) within larger samples, to explore whether there are any underlying cultural or parent gender differences here.

This is the first study to establish the measurement invariance of a measure of CPB in 4-year-olds. The findings of the present study contribute to a growing body of research examining the function of this parenting behavior in terms of its potential protective role against childhood anxiety. This study confirmed the factor structure of the CPBQ4-6, and overall the measure is considered a coherent measure for the assessment of CPB in parents of preschool-age children. Larger studies are required in order to further investigate the cross-country and cross-parent gender invariance at the level of intercepts, and studies obtaining paternal report of child anxiety in addition to maternal report will be beneficial to the field. The current study highlights the importance of examining measurement invariance before testing hypotheses regarding mothers' and fathers' parenting behaviors and their relationship

towards childhood anxiety disorders.

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**Appendix A***Scales and Items of the CPBQ4-6 for Parents of 4 to 6-Year-Old Children*

Number of items: 39	Item number
<b>Teasing (6)</b>	
I play little tricks on my child.	1
I splash my child when we're in the swimming pool.	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 instance by popping up unexpectedly.	29
I pretend that I'm going to eat my child's sweets, for example his/her cookies or dessert.	34
<b>Rough-and-tumble play (6)</b>	
I 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 enjoy having pillow-fights with my child.	23
I enjoy tickling my child.	30
I sometimes play 'tag' with my child: I chase after him/her and say in a low voice that I'm going to grab him/her.	35
<b>Encouragement of risk taking (6)</b>	
I encourage my child to do exciting things, such as jumping off high objects or climbing higher than he/she dares.	3
If 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 encourage him/her to approach it.	17
In the bath or in the swimming pool, I encourage my child to duck his/her head under water.	24
I encourage my child to gain new experiences by, for example, eating something new or playing a new game.	31
If my child thinks that he/she can't do something, I encourage him/her to try again.	32

**Social Aspects of CPB (9)**

If my child comes to me because he/she is having a minor quarrel, I make him/her sort it out it by himself/herself.	4
I encourage my child to approach unfamiliar people to ask them something.	5
I encourage my child to ask for himself/herself whether another child wants to play with him/her.	11
I encourage my child to say no if he/she doesn't want something	12
I encourage my child to perform for an audience by, for example, singing a song, dancing, or doing something sporty.	18
If my child wants to go on the see-saw or the swing, I let him/her ask for himself/herself if he/she may go on it.	19
I encourage my child to stay the night with a friend.	25
I encourage my child to stand up for himself/herself.	26
If another child snatches something from my child, I encourage my child to get it back.	36

**Competition (5)**

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 instance running races or arm wrestling.	20
I encourage my child to compete against other children.	27
I urge my child on when he/she is competing against other children	38

**Modeling (7)**

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/rough-and-tumble play) with others.	33
I show my child that I take risks.	37
I show my child that I engage with situations that I find exciting or scary.	39

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*Note:* R = item should be reverse scored in the scale.

Table 1

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

Scale	Australian sample			Dutch sample	
	items	Mother	Father	Mother	Father
CPB total score	39	.90	.91	.92	.91
Teasing	6	.63	.76	.76	.80
Rough-and-tumble play	6	.73	.71	.84	.79
Encouragement of risk taking	6	.65	.68	.72	.76
Social daring	9	.69	.68	.69	.69
Competition	5	.69	.74	.77	.70
Modeling	7	.73	.73	.78	.74

*Note.* CPB total score = higher order scale CPB.