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ORIGINAL PAPER

Recalled Challenging Parenting Behavior and Anxiety in Adulthood: An Exploratory Retrospective Cohort Study

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Abstract This research examined the relationship between recalled challenging parenting behavior (CPB) and adult anxiety and aimed to determine the underlying latent factors involved in CPB. CPB is a novel parenting construct that involves the encouragement of children to go beyond their own limits and engage with concepts they may find scary or that destabilises them, in a playful and fun way. Participants in the current study were 386 undergraduate psychology students (M age = 19.89 years, SD = 4.6; range 17–56). Questionnaire measures of CPB, anxiety, and social anxiety were delivered to participants via an online survey. An exploratory factor analysis was conducted using Principle Axis Factoring with Oblimin rotation. This identified three latent constructs underlying adults recall of CPB during childhood; parental encouragement of social assertion ('Social'), parental encouragement to engage in novel or new situations ('Novelty'), and intentional teasing ('Teasing') CPB. Both mother and father Social and Novelty CPB was associated with lower report of adult anxiety. However, only fathers Teasing was able to predict adult anxiety.

Keywords Challenging parenting behavior · Anxiety · Exploratory factor analysis

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Anxiety disorders are amongst the most common mental health disorders in the general population across developmental periods (Kessler et al. 2005). These disorders are frequent, have high rates of comorbidity, and are often linked with impairment in social, academic, and vocational domains (Kessler et al. 2005). The interference, reduced quality of life, and chronicity associated with these disorders (Kroenke et al. 2007; Rapaport et al. 2005) has ensued exploration of factors involved in their aetiology and maintenance. Of these factors, parenting characterised by greater rejection and control has been associated with both the development, and maintenance, of anxiety disorders (e.g. Hudson and Rapee 2001; Muris 2002).

These parenting behaviors have been extensively researched and the focus of several reviews and meta-analyses (McLeod et al. 2007; Möller et al. 2016). A review of these well-established parenting behaviors and their association with anxiety in offspring is beyond the scope of this paper, however, the most recent meta-analysis in this field by Möller et al. (2016) provided an overview of a growing body of research for a more recently constructed parenting domain; challenging parenting behavior (CPB) and its relationship towards childhood anxiety. CPB involves the playful encouragement of children to go beyond their own limits, and can encompass; rough-and-tumble-play and risk taking, and may also include: teasing, giving the child a fright, letting the child lose a game, and modeling of challenging behavior by the parent (Majdandžić et al. 2015). Through these avenues, CPB supports the child in their exposure to surprising and new situations, which may buffer against anxiety development (Bögels and Phares 2008). In their theoretical model, Bögels and Phares (2008) take an evolutionary approach and suggest that via challenging behavior, *fathers in particular*, have an important influence over child development, as they prepare

the child to interact with the external environment (for a full discussion see Möller et al. 2013). This is proposed to be influential towards child anxiety, as anxiety poses its greatest difficulties outside the family sphere such as with factors related to strangers, unfamiliar situations, and the greater social environment (Bögels and Perotti 2011).

Accumulating research in this area supports the idea that CPB acts as a protective mechanism against child anxiety (Lazarus et al. 2016; Majdandžić et al. 2014; Möller et al. 2015). Majdandžić et al. (2014) measured mothers' and fathers' CPB via observation and their children's *social* anxiety. Findings from this longitudinal study of 4 year olds showed that fathers' CPB was associated with decreases in observed child social anxiety, whereas mothers' CPB was associated with increases in observed child social anxiety, controlling for baseline child social anxiety. Similarly, in their study with 10–15-month-old infants, Möller et al. (2015) measured mothers' and fathers' CPB and infant anxiety via parental self-report and found that fathers' CPB was associated with less infant anxiety. They also found that mothers' CPB was not significantly correlated with greater infant anxiety. The preliminary empirical literature reviewed here implies that CPB may be particularly salient for fathers, whilst the role of mothers in this domain remains unclear. Additional research into this construct is warranted in order to enhance understanding of the role of both mothers' and fathers' CPB and the relationship of CPB towards anxiety in offspring. Thus, whilst the research available to date has provided some support for a protective relationship between CPB and anxiety disorders in *early* childhood (Majdandžić et al. 2014; Möller et al. 2015), the relationship of this parenting behavior towards anxiety *beyond* the pre-school age is yet to be explored. For example, we know little about challenging parenting in school age children (i.e. children aged between 7–12 years), nor adolescence (13–18 years), and the impact this parenting behavior may have on individuals in later life.

The use of retrospective data to explore the role of early parenting in the aetiology of anxiety disorders has played a fundamental role in establishing the impact of certain parenting behaviors and has provided a platform for the development of measures to examine these behaviors for their continued study, prior to committing to their longitudinal exploration (e.g. Gerlsma et al. 1990; Masia and Morris 1998). Two of the most widely used adult measures of recalled parenting include: The Parental Bonding Instrument (PBI; Parker et al. 1979), and the Egna Minnen Beträffande Uppfostran, which translates to "My Memories of Upbringing" (EMBU; Perris et al. 1980). A number of empirical studies utilising these measures have generally demonstrated that adults with anxiety disorders recall their parents as both rejecting and controlling (Arrindell et al. 1983; Gerlsma et al. 1990; Manicavasagar et al. 1999; Parker 1990; Rapee 1997; Rapee and Melville 1997). Historically, parenting characteristics such as overprotection were assessed via clinical impression (see for example Roth 1959). Consequently, the development of retrospective instruments such as the PBI and EMBU provided a quantifiable and reproducible measurement of parenting behaviours (Parker 1990). Furthermore, retrospective instruments are considered to be particularly useful during the early exploratory phases of investigating variables and deciding "which variables are and which are not meaningfully related to the issue investigated" (Gerlsma et al. 1990, p. 273).

In addition to the practical advantages of retrospective data collection, these methods are advantageous in the preliminary stages of building theoretical constructs, allowing the assessment and analysis of a broad domain of private experiences (Metts et al. 1991). The use of retrospective self-report data is not without its limitations, for example, it has been suggested that due to a variety of cognitive and motivational factors (i.e. recall bias, social desirability effects), people may be inefficient processors of information about their past (see Henry et al. 1994). Despite these limitations, retrospective data collection is widely used, versatile, and permits the researcher to assess private events or cognitions not amenable to direct observation (Metts et al. 1991). Moreover, retrospective data can afford the measurement of *perceived* parenting, that is, the individual's perceptions of their parents' behavior. Although *perceived* parenting may not equate to the *actual* parenting received, several studies have emphasized a positive relationship between perceived parenting behavior (i.e. perceived parental rejection and parental control) and anxiety (Grüner et al. 1999; Muris and Merckelbach 1998).

The overarching goal of the present study was to examine the relationship between recalled CPB and current adult anxiety. Specifically, we had three aims: (1) to explore the underlying factor structure of recalled CPB during childhood, (2) to examine any parental differences in recalled CPB, and (3) to examine the relationship between recalled CPB and adults' current anxiety. In line with these aims it was hypothesised that: (1) in line with the theoretical model for this construct: recalled CPB will be greater for fathers than for mothers, and (2) higher levels of recalled CPB will be associated with lower levels of current anxiety. We also aimed to identify latent constructs underlying the measured variables using a data-driven approach and report the initial reliability and correlations with measures of anxiety. For ease of utility and dissemination of the questionnaire, we also wanted to produce a final measure to have equal number of items in the mother and father versions of the scale.

Method

Participants

Participants were 386 undergraduate psychology students (*M* age = 19.89 years, *SD* = 4.6; range 17–56). Participants predominantly identified as being of female gender (76.4% female, 21.4% male, and 1.8% as other gender). The majority of the sample reported Oceanic ethnicity (51.6%), 26.9% Asian, 11.1% European, 6.7% North African and Middle Eastern, 1.8% SubSaharan African, 0.8% People of the Americas, and 1% provided insufficient ethnicity information. Of these students, 75.6% were from homes where English was the first language. Students were asked to report on their family structure when they were aged between 7–12 years, the majority of students (89.1%) were from two-parent families with a mother and father, 9.1% were from families where the mother was the sole parent, 1.6% were from families where the father was the sole parent, and one participant described their family structure as consisting of two mothers. For the purposes of maintaining anonymity, analyses for this participant were only conducted with the first caregiver reported.

Procedure

Macquarie University Human Research Ethics Committee approved all procedures prior to study commencement. Students were recruited through the university research database, where, after reading information about the study, students could provide online consent to participating in the study in return for course credit for their time. Student responses were recorded online via the survey host, Qualtrics.

Measures

The Depression Anxiety and Stress Scale (DASS-21; Lovibond and Lovibond 1995) was administered to students in order to gain a quantitative measure of depression, anxiety, and stress, and is a widely-used measure of adult anxiety (Osman et al. 2012). It has good factor structure, concurrent validity and internal consistency, with Cronbach's alpha's for the subscales found at .94 for Depression, .87 for Anxiety, and .91 for Stress (Antony et al. 1998). In the present study, the Cronbach's alphas for the depression scale was .90, .85 for the stress scale, and .83 for the anxiety scale.

The Social Interaction Anxiety Scale (SIAS; Mattick and Clarke 1998) was used to provide a quantitative measure of social anxiety symptom severity. The SIAS is a 20 item self-report measure where participants are required to rate fear of social interactions (e.g., "I am nervous mixing with people I don't know well") on a rating scale ranging from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). Three items (5, 9, and 11) were reverse scored. Cronbach's α in the present study was .94.

Students completed the Challenging Parenting Behavior Questionnaire: Retrospective version (CPBQ-R), amended for the current study. The questionnaire was modified from the original Challenging Parenting Behavior Questionnaire; 7–12-year version, (CPBQ 7–12; Majdandžić et al. 2010). The modification of the questionnaire from parent to self-report allowed participants to report the CPB their parents displayed towards them when they were between the ages of 7–12 years old. This age range was selected as it was felt to be the most appropriate range for adults to recall childhood experiences of CPB. For example, earlier versions of the questionnaire such as the toddler and pre-school versions (CPBQ4-6; Majdandžić et al. 2010). would be difficult for adults to recall. Further, the adolescent version of the measure was considered inappropriate as this period of development may be confounded by other developmental variables such as puberty. This decision was also guided by suggestions in the literature on other parenting instruments which suggested that including an age range or anchor would improve the specificity and clarity of results (Winefield et al. 1989). For example, the PBI instructs participants to recall the behaviors of each parent in their first 16 years (Parker et al. 1979). The CPBQ-R is a 43-item self-report scale that assesses challenging behavior through students' recollections of their parents' encouragement of: risk taking, rough-and-tumble play, assertiveness, competition, social daringness, and teasing. Students were asked to rate statements about their parent's interactions with them as a child (e.g., 'My father/mother would encourage me to stand up for myself'), on a 5-point Likert scale (1 = *Not Applicable*, to 5 = *Completely Applicable*). Branched logic was applied to the questionnaire based on obtained demographic information, this meant that if a participant indicated that when they were between the ages of 7–12 their family structure consisted of both a mother and father, the participant completed a mother and a father version of the CPBQ-R, if their family structure consisted of a sole parent, they completed the measure for the parent indicated. Five items were reverse scored. This is a newly developed measure and as yet no psychometric papers have been published on its reliability and validity, however, the psychometric properties of the younger age versions of this questionnaire (i.e., 4 months, 1 year and 2.5 years), have been found to be good, with CPB total scores ranging from α = .79 to .89 (for mothers), and α = .80 to .88 (for fathers) (see Majdandžić et al. 2015).

Data Analyses

To examine the underlying factor structure of recalled CPB, an exploratory factor analysis was conducted. The relationship between recalled CPB and adults' current anxiety (hypothesis 1) was examined through a series of hierarchical multiple regression analyses (MRA), whilst controlling for potential covariates (e.g. demographic variables such as gender). The hypothesis (2), that adults recalled CPB will be greater for fathers than for mothers, was examined via a series of Wilcoxon Signed Ranks Tests.

Results

Data Screening and Suitability for Factor Analysis

The data were screened for suitability for factor analysis using several well-recognised criteria. No outliers or out-of-range values were identified. The minimum amount of data for a factor analysis was satisfied, with a final sample size of 380 for mothers (6 participants were from a sole-father family), and 348 for fathers (2 participants had missing data on the scale), providing a ratio of over 8 cases per variable for mothers and fathers. Tabachnick and Fidell (2013) suggest that at least five cases for each item provide an adequate sample size for factor analysis in most circumstances. Following this principle, the minimum number of cases recommended for this analysis would be 215, with the present sample sizes being sufficient.

Inspection of the correlation matrix for the mother and father versions of the questionnaire revealed the presence of numerous coefficients of .3 and above, suggesting reasonable factorability. The Kaiser–Meyer–Olkin value for the mother version was .90, and .93 for the father version—exceeding the recommended value of .6 (Kaiser 1970, 1974). Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance for both mother (χ^2 (903) = 6794.70, $p < .001$), and father versions (χ^2 (861) = 8781.52, $p < .001$), supporting the factorability of the correlation matrixes.

The 43 items of the Retrospective Challenging Parenting Behavior Questionnaire (CPBQ-R) Mother and Father versions were individually subjected to Principle Axis Factoring (PAF) using SPSS version 23. PAF was used instead of Principle Components Analysis (PCA) as the primary purpose of this analysis was to identify the latent constructs underlying the measured variables using a data-driven approach. Further, an exploratory factor analysis (EFA) was considered more suitable than a confirmatory factor analysis as the concept of Challenging Behavior remains in the preliminary stages of the empirical and theoretical literature, further, this concept is yet to be examined retrospectively via adult self-report (for a rationale see Fabrigar et al. 1999).

Exploratory Factor Analysis—Father Questionnaire

For the initial unrotated factor solution on the father version of the questionnaire, the initial solution revealed the presence of 8 components with eigenvalues exceeding 1, explaining a total of 55.8% of the variance (with each component explaining 31.8, 11.0, 3.3, 2.7, 2.1, 1.8, 1.6 and 1.4% of the variance, respectively). The eigenvalue greater-than-one rule has been reported to overestimate the number of factors to retain (Zwick and Velicer 1986), and it has been recommended that multiple criteria are used when determining the number of factors to retain (Henson and Roberts 2006), consequently, a parallel analysis (PA) was conducted utilising syntax provided by (O'Connor 2000). Results from the PA were based on 1000 randomly generated data sets of the same sample size as the current study. The PA results identified that likewise; an 8-factor solution could be retained.

However, inspection of the communalities revealed that several items had communalities <.4, did not load onto any of the components, or cross loaded on several components (Costello and Osborne 2005). Items that failed to meet these minimum criteria were individually removed (commencing with items displaying the lowest communality) and the PAF was re-run eight times until these desired criteria were obtained. Oblique (Direct Oblimin) rotation was used to aid interpretation of the components. A total of eight items were removed from the model following this process explaining 56.7% of the variance and resulting in a 5-component solution (each explaining 36.5, 12.4, 3.2, 2.8 and 2.1% of the variance respectively).

Exploratory Factor Analysis—Mother Questionnaire

For the initial EFA, the PAF solution for Mothers revealed the presence of 10 components with eigenvalues exceeding 1. The first component not retained based on this criterion had an eigenvalue of 0.976. This unrotated factor solution accounted for 48.4% of the variance of the CPBQ items, with Component 1 contributing 21.6% of the variance, with the remaining components contributing 10.9, 3.3, 3.1, 2.3, 1.7, 1.6, 1.3, 1.3 and 1.2%, respectively. Similar to the approach used for fathers, a PA was conducted and equivalent to the PAF, the PA suggested retention of all 10 factors.

However, similar to the solution obtained for fathers, the results revealed multiple items with communalities of <.4 and items that did not load onto any of the components. Again, items not meeting these criteria were removed, and, to aid in interpretation of the components, oblimin rotation

Table 1 EFA pattern and structure coefficients of the CPBQ-R mother and father versions

Items	Social	Novelty	Teasing	h^2
My mother/father would encourage me to stand up for myself.	**.87 (.89)/.96 (.91)**	−.02 (−.54)/.07 (−.63)	.01 (.11)/.01 (.23)	.79/.83
My mother/father would encourage me to stick up for myself if others tried to walk over me.	**.75 (.74)/.82 (.80)**	.04 (−.41)/.04 (−.57)	.03 (−.11)/.02 (.22)	.54/.64
My mother/father would encourage me to stand up for my opinion.	**.84 (.83)/.78 (.82)**	−.02 (−.48)/.06 (−.63)	−.03 (.07)/−.01 (.21)	.69/.68
My mother/father would tell me to make the most of myself.	**.69 (.71)/.73 (.75)**	.03 (−.43)/.02(−.56)	.02 (.10)/.01 (.21)	.51/.56
If I thought I couldn't do something, my mother/father would encourage me to try again.	**.47 (.64)/.49 (.71)**	.29 (.56)/−.31(−.66)	−.06 (.02)/−.05 (.17)	.46/.55
If my mother/father saw something that was new or exciting to me, she/he would encourage me to approach it.	.27 (.56)/.35 (.66)	**−.47 (−.64)/−.39 (−.67)**	.03 (.11)/.09 (.29)	.46/.52
My mother/father would encourage me to gain new and exciting experiences by, for example, taking up a new hobby or sport.	.06 (.55)/.04 (.66)	**−.83 (−.86)/−.85 (−.88)**	.00 (.08)/.01 (.27)	.75/.77
My mother/father would encourage me to undertake new hobbies or activities where I would meet new people.	−.01 (.46)/02 (.62)	**−.80 (−.79)/−.83 (−.83)**	.02 (.09)/−.03 (.22)	.63/.69
My mother/father would encourage me to take part in competitions and sporting events.	.06 (.46)/−.00 (.54)	**−.67 (−.71)/−.71 (−.73)**	.01 (.08)/.07 (.27)	.51/.54
My mother/father would regularly tease me for fun.	.08 (.03)/.01 (.13)	.22 (.11)/.13 (−.12)	**.72 (.71)/.84 (.80)**	.53/.66
My mother/father would sometimes play jokes on me.	.04 (.17)/.02 (.31)	.08 (.17)/−.11 (−.36)	**.70 (.71)/.79 (.83)**	.52/.71
My mother/father would enjoy giving me a hard time by, for instance, making wisecracks.	−.03 (−.03)/−.00 (.15)	.13 (.09)/.06 (−.16)	**.69 (.68)/.77 (.75)**	.48/.56
As a prank, my mother/father would sometimes give me a real scare.	−.00 (.15)/−.03 (.17)	.12 (.18)/−.01 (−.21)	**.70 (.71)/.74 (.74)**	.52/54
At the swimming pool, my mother/father would sometimes push me into the water.	−.06 (.11)/02 (.30)	.19 (.20)/−.16 (−.35)	**.60 (.61)/.60 (.65)**	.39/.45

Note: Mother coefficients are presented first followed by father coefficients. Structure coefficients are in parentheses. Coefficients in bold load on factor. h^2 = communality coefficient. *EFA* exploratory factor analysis, *CPBQ-R* Challenging Parenting Behaviour Questionnaire: Retrospective version.

was performed. A total of 22 items were eliminated from the model as they did not contribute to a simple factor structure and failed to meet the minimum criteria, resulting in a 4-component solution which explained 52.4% of the variance (individual components explained 27.3, 16.8, 4.8, and 3.4% of the variance respectively).

Final Factor Solutions

In an attempt to establish consistency in the number of items across mother and father versions of the questionnaire, the additional 14 items that were removed from the mother version, were sequentially removed from the father version of the scale, whilst monitoring changes in variance. This 21-item father scale, explained 56.6% of the variance. However, an additional item needed to be removed due to a low communality, resulting in a 20-item scale, providing a 3-component solution, and explaining 57.8% of the variance.

For consistency, we returned to the mother scale and removed the additional item, this reduced the variance explained to 49.4% and six additional items revealed communalities <.4 or did not load onto a component. Once these items were sequentially removed from the model, the PAF of 14 items explained 55.6% of the variance resulting in a 3-component solution explaining 33.1, 16.2, and 6.3% of the variance, respectively.

Consistent with our previous approach, and to maintain consistency in the number of items used for mother and father versions of the questionnaire, the six additional items were similarly removed from the father scale. The 14-item father scale explained 62.2% of the variance resulting in a 3-factor solution explaining 41.2, 16.8, and 4.3% of the variance respectively.

The three factors represented concepts pertaining to parental encouragement of social assertion ('Social'; 5 Items), encouragement to engage in novel or new situations ('Novelty'; 4 Items), and intentional teasing ('Teasing'; 5 Items). The pattern and structure matrix for these final mother and father factor solutions are presented in Table 1.

Factors for the father version were significantly and positively correlated: Social and Teasing $r = .25$; Social and Novelty $r = .73$; and Novelty and Teasing $r = .32$ (all p's $< .01$), suggesting that factors may map onto a higher order construct representing fathers' overall CPB, so calculating a CPBQ-R total score is appropriate. For the mother version, two factors were significantly and positively correlated; Social and Novelty $r = .61$, $p < .01$, and Novelty and Teasing $r = .10$, $p < .05$. However, Social and Teasing were not significantly correlated ($r = .10$, $p = .062$), suggesting that creating a composite of these factors may not be appropriate. Due to these

Table 2 Spearman's Rho bivariate correlations between continuous measures

Variable	1	2	3	4	5	6	7	8	9
1. SIAS	–	–	–	–	–	–	–	–	–
2. DASSas	.539**[a]	–	–	–	–	–	–	–	–
3. DASSss	.502**[a]	.768**[a]	–	–	–	–	–	–	–
4. Father Social	−.180**[b]	−.079[b]	−.010[b]	–	–	–	–	–	–
5. Father Teasing	.069[b]	.205**[b]	.252**[b]	.217**[d]	–	–	–	–	–
6. Father Novelty	−.173**[b]	−.015[b]	.027[b]	.685**[d]	.296**[d]	–	–	–	–
7. Mother Social	−.173**[c]	−.053[c]	−.038[c]	.644**[e]	.159*[e]	.513**[e]	–	–	–
8. Mother Teasing	.053[c]	.182**[c]	.144**[c]	.012[e]	.448**[e]	.092[e]	.101*[f]	–	–
9. Mother Novelty	−.260**[c]	−.057[c]	−.032[c]	−.199**[e]	.190**[e]	.594**[e]	.579**[f]	.082[f]	–

SIAS Social Interaction Anxiety Scale, *DASSas* Anxiety Subscale of the Depression Anxiety and Stress Scale, *DASSss* Stress Subscale of the Depression Anxiety and Stress Scale

*$p < .05$; **$p < .01$

[a] $n = 383$

[b] $n = 347$

[c] $n = 377$

[d] $n = 348$

[e] $n = 342$

[f] $n = 380$

differences, we decided to use composite factor scores in further analyses and did not create a combined CPBQ-R total score.

Internal Consistency

Internal consistency for each of the factors was examined using Cronbach's alpha. The alphas for the mother version were good, $\alpha = .87$ for Social $\alpha = .81$ for Teasing, and $\alpha = .84$ Novelty. The alphas for the father version were also good, with $\alpha = .90$ for Social, $\alpha = .87$ for Teasing, and $\alpha = .86$ for Novelty. No substantial increases in alpha for any of the scales could have been achieved by eliminating further items.

Preliminary Analyses

All variables were checked for conformity to the assumption of normal distribution. Distributions for the social anxiety scores on the SIAS, and scores on the DASS anxiety and stress scales were not normally distributed. Square root transformations were performed on all variables but did not correct normality. Non-parametric tests on untransformed variables were performed. Where, non-parametric tests were not possible, analyses were performed with bootstrapping.

Table 2 shows the Spearman's Rho correlations amongst all continuous measures. Several small negative associations were found between mothers' and fathers' challenging behavior and adult anxiety (as measured by the DASS stress and anxiety scales) and social anxiety (as measured by the SIAS). In contrast with expectations, a small positive association was found between mothers' and fathers' challenging behavior on the teasing subscale and adult anxiety on the DASS anxiety scale ($r = .18$ and $r = .20$, respectively) and on the DASS stress scale ($r = .14$ and $r = .25$, respectively).

A series of one-way between groups analyses of variance were conducted, examining the relationship between demographic variables and variables measuring adult anxiety (SIAS total score, and DASS anxiety and stress scores). Mann–Whitney *U* Tests were conducted when demographic variables had no more than two categories, Kruskal–Wallis tests were conducted for demographic variables with three or more categories. The Mann–Whitney *U* Test indicated that the SIAS scores were significantly higher for participants who did not speak English at home ($Md = 31$, $n = 94$) compared to those who did speak English at home ($Md = 26$, $n = 289$, $U = 11{,}345.00$, $z = -2.40$, $p = .02$, $r = .12$). A similar result was obtained for the DASS anxiety subscale for those who did speak English at home scoring higher on the DASS anxiety subscale ($Md = 6$, $n = 94$) than those who did not ($Md = 4$, $n = 289$, $U = 11{,}163$, $z = -2.60$, $p = .009$, $r = .13$). No significant differences were found on the Kruskal–Wallis test for Ethnicity, Gender, or Family Structure demographic variables ($p > .05$). Consequently, regression analyses were performed whilst controlling for whether or not English was the language spoken at home (English).

Maternal and Paternal Challenging Parenting Behavior —Hypothesis 1

In order to compare mothers' and fathers' CPB scores (social, teasing, and novelty subscales) we ran a series of Wilcoxon Signed Rank Tests. As expected, significantly more CPB on the teasing subscale was reported from fathers ($Md = 2.20$) compared to mothers ($Md = 1.40$), $z = -11.16$, $p < .001$, with a medium effect, $r = .43$. For the remaining analyses, there were no significant differences between fathers social CPB($Md = 4.20$) and mothers ($Md = 4.00$), $z = -.89$, $p = .371$, or between fathers' encouragement of novelty ($Md = 3.75$), and mothers ($M = 3.75$), z $= -1.83$, $p = .067$.

Maternal and Paternal Challenging Parenting Behavior and Adult Anxiety—Hypothesis 2

Separate hierarchical regression models were run for each outcome variable: Anxiety as measured by the DASS anxiety scale (DASSas), DASS stress scale (DASSss), and social anxiety as measured by the SIAS, after controlling for whether participants spoke English at home (English). English was included as a control variable as differences in SIAS and DASSas scores were obtained during preliminary analyses, where non-English speaking households reported greater levels of anxiety than English-speaking households. English was entered at Step 1, Mother and Father CPB as measured by the three subscales; Social, Teasing and Novelty, were entered at Step 2. Prior to conducting the hierarchical MRA's, all relevant assumptions were tested. Given the length of time some participants were required to recall, and that age is an indication of length of required recall, we re-ran all analyses controlling for age, and re-ran all analyses with an age-reduced sample (17–19 years). These additional analyses did not alter the pattern of results obtained. Consequently, all participants were maintained as length of recall did not appear to impact findings.

Maternal and Paternal Challenging Parenting Behavior and Adult Anxiety (DASSas)

For the model examining mothers and fathers CPB and adult anxiety, measured through the DASS anxiety subscale, English was entered in Block 1 and accounted for a significant 1.2% of the variance in the regression model F $(1,339) = 4.126$, $p = .043$. In Block 2 the variables measuring CPB were added to the model. After controlling for English, these variables explained an additional 7.4% of the variance in Adult Anxiety on the DASSas $\Delta R^2 = .07$, ΔF $(7,333) = 4.45$, $p < .001$. Fathers' Teasing and Social subscales on the CPB were the only significant predictors in the model, ($\beta = .21$, $p = .002$, and $\beta = -.18$, $p = .039$, respectively). The Unstandardized (B) and standardized (β) regression coefficients, squared semi-partial correlations (sr^2), and 95% Confidence Intervals (bias-corrected) for each of the predictors in this regression model are reported in Table 3. Standardized regression coefficients and significance values are reported based on 1000 bootstrapped samples.

Table 3 Hierarchical multiple regression models emerging adult anxiety symptoms (DASSas)

Variable	B (95% CI)	β	sr^2
Block 1			
English	1.14 (.02, 2.27)*	.11	.01
Block 2			
English	1.10 (−.08, 2.28)[a]	.11	.01
Father Social	−.83 (−1.66, −.01)*	−.18	.01
Father Teasing	.82 (.31, 1.37)**	.21	.03
Father Novelty	.02 (−.64, .66)	.01	<.001
Mother Social	.66 (−.12, 1.40)	.13	.01
Mother Teasing	.47 (−.30, 1.29)	.08	<.01
Mother Novelty	−.16 (−.79, .60)	−.04	<.001

Note. Statistical significance: **$p < .01$; *$p < .05$; [a]$p = 0.067$

Maternal and Paternal Challenging Parenting Behavior and Adult Anxiety (DASSss)

For the model examining mothers' and fathers' CPB and adult anxiety, measured through the DASS stress subscale, English was entered in Block 1 and accounted for a non-significant 0% of the variance in the regression model F $(1,339) = .02$, $p = .896$. In Block 2 the variables measuring CPB were added to the model. After controlling for English, these variables explained an additional 7.5% of the variance in Adult Anxiety on the DASSss $\Delta R^2 = .07$, ΔF $(7,333) = 3.84$, $p < .001$. Fathers' Teasing on the CPB was the only significant predictor in the model, ($\beta = .25$, $p = .001$). The Unstandardized (B) and standardized (β) regression coefficients, squared semi-partial correlations (sr^2), and 95% Confidence Intervals (bias-corrected) for each of the predictors in this regression model are reported in Table 4. Standardized regression coefficients and significance values are reported based on 1000 bootstrapped samples.

Maternal and Paternal Challenging Parenting Behavior and Adult Social Anxiety (SIAS)

For the model examining mothers' and fathers' CPB and adult social anxiety, measured through the SIAS, English was entered in Block 1 and accounted for a non-significant 1.1% of the variance in the regression model F $(1,339) = 3.82$, $p = .051$. In Block 2 the variables measuring CPB

Table 4 Hierarchical multiple regression models emerging adult anxiety (DASSss)

Variable	*B* (95% CI)	*β*	sr^2
Block 1			
English	−.08 (−1.26, 1.05)	−.01	<.001
Block 2			
English	−.12 (−1.28, 1.10)	−.01	<.001
Father Social	−.53 (−1.33, .26)	−.11	<.01
Father Teasing	1.08 (.54, 1.62)**	.25	.05
Father Novelty	.00 (−.93, .88)	−.00	<.001
Mother Social	.59 (−.21, 1.36)	.11	<.01
Mother Teasing	.23 (−.51, .95)	.04	<.01
Mother Novelty	−.34 (−1.11, .39)	−.07	<.01

Note: Statistical significance: $^{**}p < .01$

Table 5 Hierarchical multiple regression models emerging adult social anxiety (SIAS)

Variable	*B* (95% CI)	*β*	sr^2
Block 1			
English	3.82 (.03, 7.74)[a]	.11	.01
Block 2			
English	3.17 (−.72, 7.11)	.09	<.01
Father Social	−2.45 (−5.50, .61)	−.16	<.01
Father Teasing	1.69 (−.39, 3.78)[b]	.12	.01
Father Novelty	−.25 (−3.09, 2.48)	−.02	<.001
Mother Social	.72 (−2.42, 3.73)	.04	<.001
Mother Teasing	−.29 (−2.66, 2.51)	−.01	<.001
Mother Novelty	−2.26 (−4.87, .07)[c]	−.15	.01

Note: Statistical significance: [a]$p = .051$; [b]$p = .052$; [c]$p = .053$

were added to the model. After controlling for English, these variables explained an additional 5.7% of the variance in Social Anxiety on the SIAS $\Delta R^2 = .06$, ΔF (7,333) = 3.46, $p < .001$. Following bootstrapping, none of the predictors in the model were statistically significant, however trends emerged for Fathers' Teasing ($\beta = .12$, $p = .052$) and Mothers' Novelty on the CPB ($\beta = -.15$, $p = .053$). The Unstandardized (*B*) and standardized (β) regression coefficients, squared semi-partial correlations (sr^2), and 95% Confidence Intervals (bias-corrected) for each of the predictors in this regression model are reported in Table 5. Standardized regression coefficients and significance values are reported based on 1000 bootstrapped samples.

Discussion

The purpose of the present study was threefold: to explore the underlying factor structure of recalled CPB during childhood, to examine the relationship between recalled CPB and adults' current anxiety, and finally, to examine any parental differences in recalled CPB. Overall, the findings showed three distinct factors underlying adults' recall of the challenging parenting received during childhood; parental encouragement of social assertion (Social), parental encouragement to engage in novel or new situations (Novelty), and intentional teasing (Teasing). These three factors demonstrated good internal consistency. Regarding the relationship between recalled CPB and current adult anxiety, significant relationships were found between fathers' intentional teasing and current adult anxiety, however these were not in the hypothesized direction where it was observed that higher recalled intentional teasing from fathers was associated with higher current anxiety. The remaining associations between mothers' and fathers' CPB and current anxiety were small however in the hypothesized direction. With regards to parental differences in recalled CPB, it was found that adults recalled greater amounts of intentional teasing in their fathers compared to their mothers, and that mothers and fathers did not differ in terms of recalled encouragement of social assertion and recalled encouragement to engage in novel or new situations.

The overarching goal of the exploratory factor analysis was to explore the underlying factor structure of recalled CPB during childhood through identifying latent constructs underlying the measured variables. In doing so, we utilized a conservative, data-driven approach, with the hope to achieve a final measure that contained items that were consistent across mother and father versions of the scale. This was to ensure ease of utility of the scale as well as facilitate future dissemination. The EFA led to a significant reduction in the number of items on the scale, reducing from 43 to 14 items. This item reduction however, did not compromise the variance explained by the factor solution, where it was observed that the variance explained in the initial solution for fathers increased from 55.8 to 62.2%, and a similar pattern was observed for mothers (48.4 to 55.6%). Importantly, the final factor structure of the CPBQ-R scales provided a short self-report instrument which increases the research utility of the measurement tool, especially given that most participants needed to complete the measure twice, once for their mother and once for their father. Moreover, items on the three factors that were produced by the EFA conveyed consistent themes, facilitating the classification of these subscales, and, across these three subscales, good internal consistency was found.

When interpreting the results of the exploratory factor analysis, it is important to remember that these results apply to adults' recollections of parenting received during their childhood, between the ages of 7–12 years, and that, to the authors' knowledge, the original measure (CPBQ 7–12; Majdandžić et al. 2010) is yet to be evaluated within

children of that age group. This is emphasized here as whilst two of the factors; encouragement of social assertion (Social), and encouragement to engage in novel or new situations (Novelty), were reflective of the theoretical underpinnings of CPB, the items that remained for the so named 'intentional teasing' subscale appear to have a more negative connotation rather than the playful and light-hearted aspect of this parenting behavior that was the intention of these particular items on the measure. Consequently, it is not surprising that adults' who recalled their fathers and mothers as engaging in more direct intentional teasing behaviors reported higher anxiety on the DASS-21 anxiety and stress subscales. The results of the current study suggest that it may be meaningful to return to item development to ensure that these aspects of CPB are conveyed in a more non-threatening way in alignment with the theoretical construct of CPB (see Bögels and Perotti 2011; Bögels and Phares 2008). This is especially so for adult-recalled parenting, rather than parent-rated measures of interactions with infants or young children. Further it is noteworthy that the physical aspects of CPB, such as encouraging competition and rough-and-tumble play, did not emerge as underlying latent constructs when assessing adult recall of parenting during childhood.

Results from the present study suggest that the relationship between recalled CPB and anxiety did not emerge consistently across all measures of anxiety (Hypothesis 1). For example, weak negative correlations were observed for recalled parental encouragement of social assertion (for both mothers and fathers) and current adult social anxiety; adults who recalled their parents to encourage social assertion reported less current social anxiety (as measured by the SIAS). Whereas no significant correlations were found between mothers' and fathers' encouragement of social assertion and anxiety as measured by the DASS-21. In the hierarchical regression models however, recalled paternal encouragement of social assertion emerged as the only significant predictor for adult anxiety on the DASS anxiety subscale but not for adult social anxiety on the SIAS. A potential explanation for this finding is that this result emerged after controlling for language spoken at home, whereas this variable was not controlled for in the correlational analyses. These results provide an important contribution to the anxiety literature, as a recent meta-analysis by Yap et al. (2014) reported that for the parenting behavior 'Encouraging Sociability', no effect size could be computed due to the limited number of studies examining this construct. Consequently, the findings of the present study contribute to a growing body of research suggesting that parental encouragement of sociability may be associated with lower levels of anxiety in offspring.

A similar pattern emerged for the relationship between recalled mother and father encouragement to engage in novel or new situations and current adult social anxiety, where, in the correlational analyses, this parenting behavior was associated with lower reported current social anxiety on the SIAS. However, in the hierarchical regressions, despite a trend being identified for mothers, this parenting behavior was not found to significantly predict adult social anxiety once controlling for whether or not participants spoke English at home. Further, no significant relationships were found between parental encouragement to engage in new or novel situations and the DASS-21 subscales. These findings between recalled parental encouragement of social assertion and engagement with novel situations and current adult anxiety suggest that the continued investigation of CPB at the sub-domain level is warranted, as these sub-domains may diversely impact anxiety.

As mentioned previously, the results indicating a positive relationship between parental intentional teasing and increased adult anxiety on the DASS-21 were not anticipated. Further, the results of the hierarchical multiple regression analyses indicated that this aspect of recalled parenting was particularly salient for fathers, over and above that of mothers, and after controlling for whether or not participants spoke English at home. These results help document important linkages between recalled childhood teasing and psychological adjustment in adulthood. When this parenting behavior is broadened more generally into negative parenting behaviors, such as parental rejection, the findings of the present study relate closely to early empirical findings which have also utilized adult retrospective reports. These studies pertaining to rejection, typically concluded that anxious adults generally remember their parents as being more rejecting (Masia and Morris 1998; Rapee 1997). Additionally, whilst historically, the theoretical and empirical literature has provided a mixed argument for the specific relationship between fathers' parenting behaviors and adult anxiety, the present study contributes to the literature in that recalled negative parenting behaviors from fathers may be associated with greater report of adult anxiety, over and above that of mothers. This is in accordance with the recent meta-analysis conducted by Möller et al. (2016) who found that *child* anxiety symptoms were more strongly related to paternal than to maternal parenting, where more anxiety-enhancing fathering was associated with greater child anxiety.

An important consideration with respect to the interpretation of the current findings is that the age range of participants included in this sample varied from 17 to 56 years old. This meant that the period of time adults were asked to recall ranged from a minimum of 5 years for the youngest participants, up to 49 years. In an attempt to ensure that the effects obtained in this study were not a reflection of the length of recall required, we re-ran all analyses controlling for age, and also conducted analyses

with an age restricted sample (17–19 years). As no differences in the pattern of results were obtained, it is not believed that length of recall impacted the current findings.

Overall, with respect to evaluating parental differences in CPB, the results of the present study suggest that mothers and fathers may be quite similar in their use of CPB (Hypothesis 2). This finding is consistent with the conclusions drawn by Majdandžić et al. (2015), who found that despite some small mean level differences across subscales, mothers' and fathers' CPB was very similar towards young children (aged between 0–4 years). Whilst the theoretical literature has provided a strong argument for the relationship between fathers and CPB (see Bögels and Perotti 2011; Bögels and Phares 2008), and the results of the present study support this to some extent, the results of the present study also suggest that the continued investigation of the role of mothers' CPB towards child anxiety is warranted.

Limitations

The results of the present study provide important preliminary evidence regarding the aspects of CPB that are recalled by adults and additionally provide novel insight into this relationship towards anxiety in adults. However, the limitations of the study should be considered. First, the cross-sectional design of this study means that it is not possible to delineate cause and effect. For example, it could be that anxiety leads an adult to recall certain aspects of CPB but not others, or, as other have suggested, symptomology enables the distortion of some memories (Spokas and Heimberg 2009). Second, these preliminary findings need to be considered within the context of sample demographics: undergraduate psychology students, the majority of which were female, further, no information regarding socio-economic status of participants was obtained, limiting the generalizability of results. Third, although the main focus of the present study was to develop greater understanding into the relationship between CPB experienced in childhood and whether these memories extend into adulthood, and the relationship of these recalled parenting characteristics on current anxiety, a limitation of this study was the reliance on adult retrospective report. Whilst this limitation was previously acknowledged, the results provide important information regarding the parenting aspects of recalled CPB that remain salient for adults and highlight areas for further investigation. As this is an initial study to examine CPB retrospectively and from the perspective of the child rather than parent report, these results need to be replicated, preferably with multiple reporters (i.e., mothers and fathers), to enhance the validity of the construct. Finally, as previously mentioned, future research may wish to adjust items on the measure so that they can be interpreted in the way they were intentioned, (i.e. as a positive parenting behavior), and try to capture elements of CPB that are hypothesised to be protective towards anxiety, such as the encouragement of safe risk taking, and rough-and-tumble play. Once these adjustments have been made, future research would benefit from confirming the underlying structure of recalled CPB via Confirmatory Factor Analysis and testing the relationship of this construct towards anxiety in independent samples. Although these various limitations could not be addressed in the present study, they present varied and exciting avenues for future research.

The findings of the present study contribute to a growing body of research in the area of CPB by providing insight into the aspects of this parenting behavior that are recalled into adulthood and may be important for protecting against anxiety aetiology, such as the encouragement of social assertion by parents. These findings also highlight the importance of developing psychometrically sound and valid measurement tools prior to drawing strong conclusions about aspects of CPB that may or may not be important in anxiety aetiology. For example, whilst fathers' teasing was related to increased adult anxiety, this concept as it has evolved here does not describe CPB as it was intended. Thus, whilst there is a need to return to item-development to ensure that all aspects of CPB are captured adequately, this study provided a platform for this future work. This study also determined that there is continued need to explore the role of both mothers and fathers in this parenting domain.

Data Availability Statement

Due to ethical constraints, data cannot be made openly accessible on online platform. Please contact the corresponding author for access to de-identified data.

Author contributions R.S.L. designed and executed the study, conducted data analyses, and wrote the paper. L.F.M. collaborated with the analyses and writing of the paper. J.L.H. collaborated with the design, analyses and writing of the paper.

Compliance with ethical standards

Conflict of interest The authors declare that they have no competing interests.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval for this study was obtained from Macquarie University Human Research Ethics Committee.

Informed consent Informed consent was obtained from all individual participants included in the study.

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