Análise Psicológica (2021), 2 (XXXIX): 299-311 doi: 10.14417/ap.1688

Multidimensional Factor Structure of the Modified Child Rearing Practices Report questionnaire (CRPR-Q) in a sample of Portuguese mothers: A bifactor approach

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Parental attitudes toward child socialization influence their child-rearing practices, the quality of parent-child relationships, and children's developmental outcomes. The Modified Child Rearing Practices Questionnaire (CRPR-Q) has been widely used to assess parenting practices across children's development. However, the few studies investigating its two-factorial structure (nurturance and restrictiveness) have shown inconsistent findings and have not explored measurement invariance across children's sex and age groups. The aims of this study were to (1) further investigate the factorial structure of the CRPR-Q, by using bifactor solutions (b-confirmatory factor analysis [B-CFA] and b-exploratory structural equation modeling [B-ESEM]) and (2) examine the measurement invariance of CRPR-Q across children's sex and age groups. A community sample of 589 Portuguese mothers of children aged 3 to 15 years completed the CRPR-Q. Our findings revealed that the B-ESEM model best fit the data. A clear differentiation between the two a priori factors (nurturance and restrictiveness) was found. However, our findings suggest the need to control for content specificity and rely on a broader perspective regarding the nurturance factor. Measurement invariance was observed across children's sex but not across children's age groups. These findings contribute to a more in-depth understanding of the underlying relationships among the CRPR-Q items.

Key words: Child-rearing attitudes and practices, Bifactor exploratory structural equation modeling, Measurement invariance, Child's sex, Child's age.

Introduction

Parents contribute to the socialization of children in several significant ways. For example, parents hold beliefs that influence their child-rearing practices, the quality of the relationships that they establish with their children, and, ultimately, children's developmental outcomes, from the early years to adolescence (Bornstein et al., 2018; Rubin & Chung, 2006). Assessing parents' child-rearing practices using reliable and valid measures is crucial to designing evidence-based parenting interventions that can foster healthy developmental pathways from early childhood to adolescence.

This research has been supported in part by grants from the Portuguese Foundation for Science and Technology (FCT) (UIDB/04810/2020; SFRH/BD/134132/2017; 2020.01755.CEECIND).

The authors acknowledge all parents who participated in the study, as well as the schools and teachers. The authors also thank all the members of the research team for their assistance and support.

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Theoretical underpinnings of child-rearing practices

According to Darling and Steinberg (1993), parenting practices can be defined as goal-directed behaviors through which parents socialize their children. Research derived from the psychodynamic and social learning traditions (Darling & Steinberg, 1993, for a review) and from the insights of Baumrind (1967, 1971, 1989, 1991) and Maccoby and Martin (1983) have described parenting practices, in terms of two broad dimensions. Parental warmth or responsiveness reflects accepting, nurturing, supportive and responsive parenting behaviors that foster child's individuality, self-regulation and self-assertion (Baumrind, 1991; Maccoby & Martin, 1983). Parental control or demandingness can be understood as a set of parenting behaviors that involve maturity demands toward the child, the monitoring of child's behaviors and the enactment of disciplinary actions, when needed (Baumrind, 1991).

Several instruments have been designed to assess child-rearing practices in terms of parenting dimensions, with varying levels of specificity. Among them, the *Child Rearing Practices Report* (CRPR) has been widely used across children's development (Dekovic et al., 1991). Designed by Block (1965), the CRPR is a forced-choice Q-Sort rating system, consisting of 91 behaviorally anchored statements relevant to socialization that parents were asked to arrange on a seven-point scale (from the least to the most descriptive), with 13 prescribed items at each point. Although providing conceptually rich data on child-rearing, exploratory factorial analyses revealed that the number and internal consistency of dimensions derived from the CRPR Q-Sort varied from sample to sample (ranging from 21 to 33 factors) and represented highly-specific parenting qualities, such as independence, control, rationale guidance, enjoyment of child, expression of affection and punishment (e.g., Block, 1980; McNally et al., 1991; Roberts et al., 1984).

The Modified Child Rearing Practices Report Questionnaire (CRPR-Q)

To make the assessment less time-consuming and derive broader dimensions of parenting qualities, Rickel and Biasatti (1982) developed the Modified Child Rearing Practices Report Questionnaire (CRPR-Q). A questionnaire in the format of Block's CRPR Q-Sort was administered to a sample of 211 undergraduate US students, many of whom were parents. A principal component analysis with varimax rotation led to the selection of a two-factor solution, composed of 40 items. On the one hand, the restrictiveness factor consists of 22 items that assess child-rearing practices that are characterized by a high degree of control toward children's behaviors and feelings, the establishment of narrow limits on children's behaviors, the endorsement of strict rules, requirements and restrictions. On the other hand, the nurturance factor includes 18 items that represents flexible child-rearing practices related to the willingness of parents to listen and share experiences with their children, as well as to demonstrate affection, acceptance and responsiveness toward their children's needs. The internal consistency of both factors was corroborated in an independent sample of 95 parents, to whom the CRPR-Q was administered before attending parent training.

Since its development, the CRPR-Q has been used in a wide range of studies involving parents of preschool (e.g., Andersson & Sommerfelt, 2001; Woolfson & Grant, 2006) and/or school-aged children (e.g., Andersson & Sommerfelt, 2001; Ceballo & Hurd, 2008; Lindhout et al., 2009; Root et al., 2016) and adolescents (e.g., Booth-LaForce et al., 2012; Murray et al., 2014) and its two original factors have been accepted by most researchers. Nevertheless, the few studies that have investigated the factor structure of the CRPR-Q have failed to replicate the original two-factor solution proposed by Rickel and Biasatti (1982). Dekovic et al. (1991) examined the factor structure of the CRPR-Q in a sample of 239 Dutch parents (124 mothers, 115 fathers) of school-aged children, who had at least one child attending primary school who was nominated by peers as popular or rejected. The principal component analysis yielded a two-factor solution comprising

35 items. The confirmatory factor analysis showed that the model fit deviated significantly from the theoretical goodness of fix indices. Subsequent studies on the factorial structure of the CRPR-Q conducted in different cultural contexts (e.g., Indonesia, Brazil, Barbados Islands) have used principal component analysis procedures and yielded inconsistent findings concerning the number and content of identified factors, in samples of parents of preschool and school-aged children and adolescents (Chuang et al., 2013; Nunes et al., 2013; Payne & Furman, 1992).

The highly contrasting findings in literature may reflect the use of principal component analyses procedures that capitalize on sample variability and highlight the need to explore further the factor structure of the CRPR-Q in community samples, using more advanced statistical tools. In fact, scholars have acknowledged that parenting practices can be described in terms of two main parenting dimensions that represent two theoretically independent goal-directed behaviors through which parents socialize their children (Darling & Steinberg, 1993), but that these two parenting dimensions can be also considered together (Pinquart, 2017) to understand the general emotional climate in which parents express these behaviors. Conventional factor analysis approaches may often fail to capture the multidimensionality of the latent structure of the CRPR-Q and more sophisticated modeling approach is needed. Bifactor models provide a flexible approach that allow to investigate multidimensional constructs that includes domain-specific dimensions that are expected to be independent and to determine whether an instrument has a general factor accounting for the commonality shared by these domain-specific dimensions (Morin et al., 2016; Reise, 2012; Reise et al., 2011). This can contribute to a better understanding of the factor structure of the CRPR-Q. Furthermore, the assessment of conceptually-related constructs (such as, the two dimensions of parenting practices) and the fallible nature of indicators suggests that it is plausible to expect cross-loadings between items and non-target factors, so that it can be useful to rely on the exploratory structural modelling (ESEM) framework that integrates exploratory and confirmatory factor analyses (Morin et al., 2016). The integration of bifactor modelling with ESEM (bi-factor exploratory structural equation modelling, B-ESEM) has been used to examine the issue of construct relevant multidimensionality and has demonstrated to be useful for scales refinement and validation, since it provides a comprehensive and flexible model to describe complex psychological constructs. However, to the best of our knowledge, the factor structure of the CRPR-Q has not been investigated previously using bifactor approaches.

Furthermore, prior research showed that parental reports of nurturance and restrictiveness did not differ, according to children' sex (e.g., Booth-LaForce et al., 2012; Murray et al., 2014; Payne & Furnham, 1992). Although the parental perceptions of specific parenting qualities related to nurturance remain stable across children's ages, extant studies showed an increase in parental reports of restrictiveness during early adolescence (McNally et al., 1991; Roberts et al., 1984). However, the measurement invariance of the CRPR-Q across children's sex (male *vs.* female) and age groups (children *vs.* adolescents) has not been previously examined.

To overcome the identified inconsistencies and gaps in the current state-of-the-art knowledge, the aims of the present study were (1) to investigate further the factor structure of the CRPR-Q, by using bifactor solutions (b-confirmatory factor analysis [B-CFA] and B-ESEM) obtained from two of the most conventional modeling approaches (CFA and ESEM) and (2) to examine the invariance of CRPR-Q across children's sex and age groups (3-10 years *vs.* 11-15 years). Based on the literature, we hypothesized that the bifactor approaches would provide a more accurate representation of the distinct nature of the two dimensions (nurturance and restrictiveness) incorporated in the factorial model of the CRPR-Q. This approach also relies on a more precise disaggregation of the global construct supporting responses to all items (global factor) when compared with alternative models. With respect to measurement invariance, we expect that measurement invariance across children's sex (male *vs.* female), but not across age groups (children *vs.* adolescents).

Method

Participants

The participants were 589 mothers, recruited from Portuguese public schools in the Lisbon metropolitan area. The mothers' ages ranged from 21 to 56 years old (*M*=39.36, *SD*=5.66). The majority of mothers were either married or cohabiting (70.2%). Children's ages ranged from 3 to 15 years old (*M*=9.73, *SD*=3.67); 55.9% (*n*=329) were girls.

Measure

The Child Rearing Practices Report-Questionnaire (CRPR-Q, Rickel & Biasatti, 1982) is a 40-item self-report instrument that assesses parental child-rearing practices. From the original 40 items, four were dropped because their content related to sexual issues was perceived as inappropriate in several studies involving parents (e.g., Nunes et al., 2013). Parents were asked to focus on a specific child in the family to rate each item, using a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). This measure comprises two subscales of 18 items each. Nurturance refers to parenting practices focusing on care, affection, and sharing feelings (e.g., "I express affection by hugging, kissing, and holding my child"). Restrictiveness is related to parenting practices focusing on control of the child's behavior, according to values in which parents believe (e.g., "I prefer that my child not try things if there is a chance he will fail"). Item ratings pertaining to each subscale are averaged to yield a subscale score. Higher scores in each subscale indicate that parents perceive higher care, affection, and sharing of feelings (nurturance), or control of child behavior (restrictiveness), in their parenting practices. In the original study, the CRPR-Q showed good internal consistency (α =.84 for nurturance; .85 for restrictiveness) and validity (Rickel & Biasatti, 1982). In our sample, Cronbach's α was .83 for nurturance and .86 for restrictiveness.

Procedure

This study is part of wider research projects approved by the [Blind_for_Review] Ethics Committee. After obtaining the approval of the original authors, the CRPR-Q was translated into Portuguese, following a committee approach (Brislin, 1980). After the translation of the CRPR-Q, the study was presented to the boards of participating schools to obtain the necessary authorizations for data collection. For children aged 3-10 years, school boards sent mothers an anonymous link to online informed consent and questionnaires by e-mail. For children aged 11 to 15 years, mothers were asked to complete an informed consent. After obtaining the mothers' consent, teachers sent them the self-report questionnaire to be completed at home. After completion, the mothers returned the questionnaires to teachers in a closed envelope.

Data analysis

All missing data were excluded. From the original data set (626 participants), 37 observations were considered as multivariate outliers (p<.001) through the exploration of Mahalanobis distances; outliers were dropped from the study. The uni- and multivariate distribution of items was checked. Considering the absolute values of the univariate skewness (|Sk|>3) and kurtosis (|Ku|>7) (Kline, 2011), two items had values indicating a violation of normal distribution. Item 2 (Sk[-3.92]; Ku[17.14]) had *M*=5.90 (*SD*=.36), with *mode* and *median*=6.00. Also, item 23 (Sk[-3.34]; Ku[13.97]) had *M*=5.82 (*SD*=.48), also with *mode* and *median*=6.00. Considering that the analyses were performed using the robust maximum likelihood (MLR) estimator method, these two items were not removed. None of the remaining items had values indicating the violation of the normal distribution (Sk[-2.41; .65]; Ku[-.93; 5.76]). The final sample consisted of 589 participants.

The two-factor structure of the CRPR-Q was estimated with four different solutions: an independent cluster model-confirmatory factor analysis (ICM-CFA), a bifactor model-confirmatory factor analysis (B-CFA), exploratory structural equation modeling (ESEM), and bifactor model-exploratory structural equation modeling (B-ESESM). All modeling analyses were conducted with M*plus* 7.4 (Muthén & Muthén, 2012). The robust maximum likelihood (MLR) estimator was used, since it provides standard errors and fit indices that are robust to the Likert-scale format of item responses and violations of normality (Morin et al., 2016).

Model fit was assessed by examining the most common fit indices and information criteria: comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square of approximation (RMSEA, with confidence intervals – CI), Akaike information criterion (CFI), Bayesian information criterion (BIC), and sample-size-adjusted BIC (ABIC). According to established standards (Hu & Bentler, 1999), values closer or greater than 0.95 for CFI and TLI, and RMSEA values smaller than 0.06 were considered to be indicative of excellent model fit. Lower values of AIC, BIC, and ABIC were interpreted as reflecting a better fit to the data of one model in comparison to others with higher values. For testing alternative models, ΔCFI and ΔTLI≥0.01 and ΔRMSEA≥0.015 suggested more restrictive models, as argued by Chen (2007).

To clarify the factor structure of the CRPR-Q that best fits the data, the aforementioned contrasting models (ICM-CFA, B-CFA, ESEM, B-ESEM) were evaluated and compared (Figure 1).

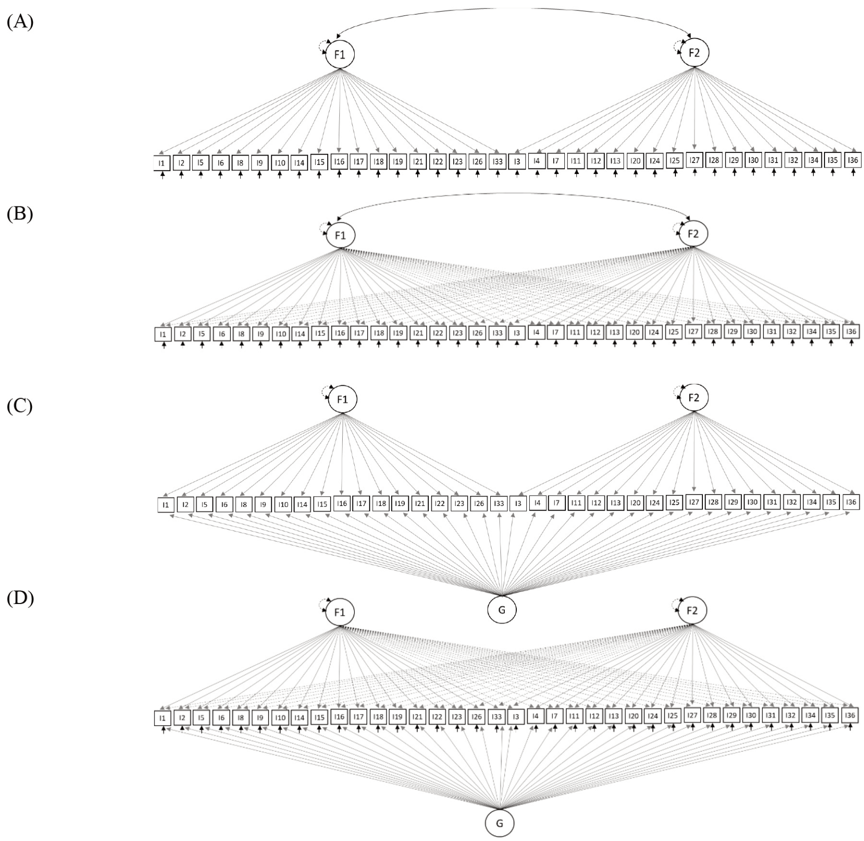

Figure 1. Alternative structural models of CRPR-Q

Note. (A) ICM-CFA=Independent Cluster Model – Confirmatory Factor Analysis, (B) ESEM=Exploratory Structural Equation Modeling, (C) Bifactor-CFA=Bifactor model – Confirmatory Factor Analysis, and (D) Bifactor-ESEM=Bifactor model – Exploratory Structural Equation Modeling.

First, a CFA was conducted to test a two-factor solution, representing the two aforementioned correlated factors (nurturance and restrictiveness). This model was specified according to the ICM assumption, so that each item was allowed to load only on the factor it was assumed to measure, and all cross-loadings constrained to be zero. Second, a B-CFA model was tested, specified as orthogonal, so that all items were allowed to load simultaneously on one G factor and on their a priori S factors corresponding to the two distinct parenting practices, with no cross-loadings allowed between S factors. The orthogonal rotation ensured the interpretability of the solution in line with the bifactor assumption that the S factors reflect the part of item variance that is not explained by the G factor, whereas the G factor reflects the part of the item variance that is shared across all items (Morin et al., 2016). Third, ESEM, which integrates CFA and EFA into a single structural equation model, was tested. This model was specified, using target rotation. Target rotation seems particularly appropriate, since it allows the pre-specification of target and non-target factor loadings in a confirmatory manner. Item loadings on their a priori factors and all cross-loadings were freely estimated, but "target" factor loadings were specified to be as close as possible to 0. Finally, the B-ESEM model was tested, using orthogonal target rotation. All items were allowed to define the G factor, while the two S factors were defined from the same pattern of target and non-target factor loadings and cross-loadings (similarly to the ESEM solution). Thereafter, analyses were conducted by using progressively more stringent invariance assumptions (Millsap, 2011) to test measurement invariance across children's sex and age groups.

Results

The best CRPR-Q model solution was established following the procedures of Morin et al. (2016) regarding the test of multidimensionality. First, the global goodness of fit indices for all the models tested were examined and compared. Then, we compared the IMC-CFA and ESEM to investigate the presence of construct-relevant psychometric multidimensionality, due to the fallible nature of indicators and the presence of conceptually related constructs. Finally, the presence of a hierarchically superior latent construct was evaluated by comparing the fit of B-CFA and the B-ESEM with target rotation models, and then the patterns of loadings and cross-loadings in the B-ESEM with the target rotation model.

Table 1 presents the goodness of fit indices and information criteria of each of the estimated models. The ICM-CFA solution did not fit the data (CFI and TLI<.90). The ESEM solution provided a marginally acceptable fit and better represented the data, since fit indices improved (ΔCFI=-0.09, ΔTLI=0.1, ΔRMSEA=0.02) and the values of AIC, BIC, and ABIC decreased. The 90% confidence intervals for RMSEA showed no overlap between ICM-CFA and ESEM solutions, indicating a higher degree of differentiation between these two competing models. A χ^2 differences test showed that the fit of ESEM model was significantly better than the ICM-CFA model [$\chi^2_{dif}(34)=516.46$, p=.000].

Parameter estimates for the ICM-CFA and ESEM models (Table 2) revealed a well-defined two-factor structure. The overall size of the standardized factor loadings of the items in their target-factors and cross-loadings remained similar in both solutions (ICM-CFA: λ=0.20 to 0.73, M=0.49; ESEM: λ=0.20 to 0.73, M=0.485), showing well-defined factors corresponding to a priori expectations. Table 3 shows differences in the correlations between the two contrasting solutions, with lower correlations for ESEM than for the ICM-CFA. Previous studies have demonstrated that ESEM tends to provide a better representation of the true correlations between factors (Asparouhov & Muthén, 2009). The weak and negative correlations support a clear differentiation between the two aforementioned parenting dimensions. Although the majority of cross-loadings in the ESEM solution remained small (|λ|<0.10), and target factor loadings remained higher than cross-loadings, some of the loadings were large enough to support the need for bifactor models, indicating a possible G-factor (seven items with values between 0.20 and 0.49).

Table 1

Goodness of fit statistics and information criteria for the models estimated on the CRPR-Q

	χ^2_{dif}	*df*	CFI	TLI	RMSEA	90% CI	AIC	BIC	ABIC	$\Delta\chi^2_{dif}$	*p*	ΔCFI	ΔTLI	ΔRMSEA
ICM – CFA	1622.554*	589	0.80	0.78	0.06	0.05-0.06	56310.84	56805.60	56446.87					
B – CFA	1217.546*	554	0.87	0.85	0.05	0.04-0.05	55943.47	56591.47	56121.62					
ESEM	1106.094*	555	0.89	0.88	0.04	0.04-0.05	55857.80	56501.43	56034.75					
B – ESEM	920.190*	521	0.92	0.91	0.04	0.03-0.04	55718.13	56510.62	55936.01					
Invariance_Sex														
Configural invariance	1552.791*	1042	0.90	0.88	0.04	0.04-0.05	55663.30	57247.06	56097.84	–				
Weak invariance	1633.479*	1141	0.91	0.90	0.04	0.03-0.04	55587.03	56737.66	55902.73	80.69 (99)	0.91	-0.01	-0.02	0.00
Strong invariance	1663.629*	1174	0.91	0.90	0.04	0.03-0.04	55550.92	56557.17	55827.00	30.15 (33)	0.61	0.00	0.00	0.00
Strict invariance	1614.030*	1210	0.92	0.92	0.03	0.03-0.04	55484.02	56332.78	55716.89	49.60 (36)	0.07	-0.01	-0.02	0.01
Invariance_Age														
Configural invariance	1596.151*	1042	0.87	0.84	0.04	0.04-0.05	50538.24	52098.43	50949.29	–				
Weak invariance	1891.159*	1141	0.82	0.80	0.05	0.05-0.05	50655.20	51788.70	50953.83	295.01 (99)*	0.00	0.05	0.04	-0.01
Strong invariance	2098.215*	1174	0.78	0.76	0.05	0.05-0.06	50801.47	51792.75	51062.64	207.06 (33)*	0.00	0.04	0.04	-0.01
Strict invariance	2334.095*	1213	0.73	0.72	0.06	0.05-0.06	51041.41	51864.61	51258.29	235.88 (39)*	0.00	0.05	0.04	0.00

Note. CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; RMSEA=Root Mean Square of Approximation; CI=Confidence Interval; AIC=Akaike Information Criterion; BIC=Baysian Information Criterion; ABIC=Sample Size Adjusted BIC; ICM-CFA=Independent Cluster Model – Confirmatory Factor Analysis; B-CFA=Bifactor model – Confirmatory Factor Analysis; ESEM=Exploratory Structural Equation Modeling; B-ESESM=Bifactor model – Exploratory Structural Equation Modeling; df=degrees of freedom; ESEM were estimated with target rotation and B-ESEM with bifactor orthogonal target rotation. *p<.001.

Table 2

Standardized factor loadings (λ) and uniqueness (δ) for all solutions of CRPR –Q

		ICM-CFA		B-CFA			ESEM			B-ESEM			
				G-Factor	S-Factor		S-Factor 1	S-Factor 2		G-factor	S-Factor 1	S-Factor 2	
	Item	λ	δ	λ	λ	δ	λ	λ	δ	λ	λ	λ	δ
Nurturance	1	0.54	0.29 ***	0.19	0.59 ***	0.39 ***	**0.54** ***	-0.24 ***	0.35 ***	0.35 ***	**0.42** ***	-0.24 ***	0.36 ***
	2	0.49 ***	0.24 ***	0.34 **	0.37 ***	0.25 ***	**0.50** ***	-0.05	0.25 **	**0.39** ***	**0.32** ***	-0.04	0.26 ***
	5	0.39 ***	0.15 ***	0.11	0.45 ***	0.22 ***	**0.38** ***	-0.20 ***	0.19 ***	0.25 ***	**0.30** ***	-0.19 ***	0.19 ***
	6	0.31 ***	0.09 ***	0.24 ***	0.20 **	0.10 ***	**0.30** ***	0.16 ***	0.12 ***	0.12	**0.30** ***	0.16 **	0.13 ***
	8	0.55 ***	0.30 ***	0.45 ***	0.32 *	0.30 ***	**0.55** ***	0.08 **	0.31 ***	0.39 ***	**0.38** ***	0.09 **	0.30 ***
	9	0.42 ***	0.18 ***	0.14	0.45 ***	0.22 ***	**0.40** ***	-0.09 **	0.17 ***	0.10	**0.48** ***	-0.10 **	0.25 ***
	10	0.43 ***	0.19 ***	0.18	0.44 ***	0.23 ***	**0.43** ***	-0.17 ***	0.22 ***	0.29 ***	**0.33** ***	-0.17 ***	0.22 ***
	14	0.23 ***	0.05 ***	0.20 ***	0.12	0.05 **	**0.22** ***	0.17 ***	0.08 **	0.02	**0.29** ***	0.16 ***	0.11 **
	15	0.59 ***	0.35 ***	0.53 ***	0.29	0.37 ***	**0.59** ***	0.09 *	0.36 ***	**0.42** ***	**0.41** ***	0.10 *	0.36 ***
	16	0.29 ***	0.09 ***	0.12	0.30 ***	0.10 ***	**0.28** ***	-0.02	0.08 **	0.04	**0.35** ***	-0.02	0.13 ***
	17	0.53 ***	0.28 ***	0.38 ***	0.38 ***	0.27 ***	**0.52** ***	0.02	0.27 ***	0.34 ***	**0.39** ***	0.03	0.27 ***
	18	0.59 ***	0.35 ***	0.30 *	0.54 ***	0.38 ***	**0.58** ***	-0.13 ***	0.36 ***	0.37 ***	**0.45** ***	-0.12 ***	0.36 ***
	19	0.73 ***	0.54 ***	0.49 ***	0.54 ***	0.53 ***	**0.73** ***	-0.03	0.53 ***	0.47 ***	**0.56** ***	-0.02	0.53 ***
	21	0.31 ***	0.10 ***	0.15	0.30 ***	0.11 ***	**0.31** ***	-0.03	0.10 ***	0.07	**0.37** ***	-0.03	0.14 ***
	22	0.71 ***	0.50 ***	0.54 ***	0.46 **	0.50 ***	**0.71** ***	0.10 **	0.51 ***	0.42 ***	**0.58** ***	0.10 **	0.52 ***
	23	0.68 ***	0.47 ***	0.59 ***	0.38 *	0.50 ***	**0.70** ***	0.03	0.49 ***	**0.53** ***	**0.46** ***	0.04	0.49 ***
	26	0.43 ***	0.19 ***	0.54 ***	0.09	0.30 ***	**0.45** ***	0.24 ***	0.26 ***	**0.40** ***	**0.23** **	0.25 ***	0.28 ***
	33	0.20 ***	0.04 *	0.18 **	0.11	0.04 *	**0.20** ***	0.21 ***	0.08 ***	-0.03	**0.29** ***	0.21 ***	0.13 ***
Restrictiveness	3	0.26 ***	0.07 **	0.01	0.27 ***	0.07 **	0.02	**0.25** ***	0.07 **	-0.16 *	0.17 **	**0.25** ***	0.12 **
	4	0.41 ***	0.16 ***	-0.04	0.44 ***	0.19 ***	-0.09 *	**0.39** ***	0.16 ***	-0.16 **	0.01	**0.38** ***	0.17 ***
	7	0.59 ***	0.35 ***	-0.05	0.64 ***	0.41 ***	-0.19 ***	**0.58** ***	0.38 ***	-0.30 ***	-0.01	**0.58** ***	0.42 ***
	11	0.40 ***	0.16 ***	0.17	0.36 ***	0.16 ***	0.04	**0.39** ***	0.15 ***	0.11	-0.07	**0.40** ***	0.18 ***
	12	0.49 ***	0.24 ***	0.36 **	0.41 ***	0.29 ***	0.14 ***	**0.50** ***	0.27 ***	0.33 ***	-0.13 **	**0.53** ***	0.40 ***
	13	0.55 ***	0.31 ***	0.17	0.53 ***	0.31 ***	0.02	**0.56** ***	0.31 ***	-0.11	0.11	**0.55** ***	0.33 ***
	20	0.30 ***	0.09 ***	0.63 ***	0.15	0.42 ***	0.49 ***	**0.33** ***	0.34 ***	**0.51** ***	0.19 **	**0.35** ***	0.42 ***
	24	0.51 ***	0.26 ***	0.41 ***	0.42 ***	0.34 ***	0.20 ***	**0.53** ***	0.32 ***	0.19 *	0.08	**0.54** ***	0.33 ***
	25	0.50 ***	0.25 ***	0.26 ***	0.45 ***	0.27 ***	0.14 ***	**0.51** ***	0.27 ***	0.02	0.15 **	**0.51** ***	0.28 ***
	27	0.62 ***	0.38 ***	0.07	0.63 ***	0.40 ***	-0.06 *	**0.61** ***	0.38 ***	-0.25 ***	0.13 **	**0.61** ***	0.45 ***
	28	0.66 ***	0.43 ***	0.14	0.64 ***	0.43 ***	-0.06 *	**0.65** ***	0.43 ***	-0.07	-0.05	**0.65** ***	0.43 ***
	29	0.71 ***	0.51 ***	0.24	0.66 ***	0.49 ***	-0.04	**0.71** ***	0.51 ***	0.03	-0.11 *	**0.72** ***	0.53 ***
	30	0.49 ***	0.24 ***	0.06	0.49 ***	0.24 ***	-0.10 **	**0.48** ***	0.24 ***	0.03	-0.19 **	**0.49** ***	0.27 ***
	31	0.56 ***	0.32 ***	0.20	0.53 ***	0.32 ***	0.02	**0.56** ***	0.31 ***	0.10	-0.10 *	**0.57** ***	0.34 ***
	32	0.58 ***	0.34 ***	0.13	0.56 ***	0.33 ***	-0.03	**0.58** ***	0.34 ***	-0.09	0.02	**0.57** ***	0.34 ***
	34	0.42 ***	0.17 ***	-0.21 **	0.50 ***	0.30 ***	-0.28 ***	**0.40** ***	0.24 ***	-0.31 ***	-0.11 *	**0.39** ***	0.26 ***
	35	0.65 ***	0.43 ***	0.17	0.63 ***	0.43 ***	-0.02	**0.65** ***	0.43 ***	-0.11	0.04	**0.65** ***	0.43 ***
	36	0.37 ***	0.14 ***	0.03	0.38 ***	0.15 ***	-0.05	**0.37** ***	0.14 ***	-0.12 *	0.04	**0.36** ***	0.15 ***

Table 3

Standardized factor correlations for both the IMC-confirmatory factor analysis (above the diagonal) and exploratory structural equation model (below the diagonal) solutions for the CRPR-Q

	Nurturance	Restrictivness
Nurturance		-0.033[ns]
Restrictivness	-0.021[ns]	

Table 1 shows that the B-CFA solution provided a marginally adequate fit and the B-ESEM model provided an acceptable-to-excellent fit to the data, according to all indices and lower values of the information criteria when compared with the remaining models. A χ^2 differences test showed that the fit of the B-ESEM model was significantly better than the B-CFA model [$\chi^2_{dif}(33)=297.36$, $p=.000$], with lower values on the information criteria.

Beyond fit indices, the selection of the final model was based on theoretical conformity and examination of parameter estimates. Factor loadings of the B-ESEM model were indicative that the G factor is not a well-defined factor, showing the multidimensionality of the questionnaire. Beyond the G-factor, the loadings on the target-specific factor were substantially larger ($\lambda=0.25$ to 0.72, $M=0.44$) than the non-target loadings ($\lambda=0.01$ to 0.25, $M=0.01$). However, four items from the nurturance factor (item 2: "I feel a child should be given comfort and understanding when he is scared or upset"; item 15: "I talk it over and reason with my child when he misbehaves"; item 23: "I encourage my child to talk about his troubles"; and item 26: "When I am angry with my child, I let him know about it") and one item from the restrictiveness factor (item 20: "I expect my child to be grateful and appreciate all the advantages he has") had higher loadings in the G factor.

Measurement invariance by children's sex and age groups

Measurement invariance was tested across children's sex (girls *vs.* boys) and age group (3-10 *vs.* 11-15 years) to investigate whether the best fitted model (B-ESEM) for the whole sample also fitted well for the aforementioned groups. Table 1 shows that an acceptable fit for sex was found. When the selected model was executed with the two sex groups nested, we did not observe a decrease in model fit larger than the recommended cut-off scores, suggesting configural invariance across sexes. Similar findings were observed when constraining factor loadings; factor loadings and intercepts; and factor loadings, intercepts, and uniqueness.

Table 1 shows that the two-factor B-ESEM solution was not invariant across children's age groups. As displayed in Table 4, scores on nurturance were stable as children's ages increased. However, scores on restrictiveness increased with children's age.

Table 4

Means by nurturance and restrictiveness across age groups

	3-5 years	6-9 years	10-12 years	13-15 years
	M	*M*	*M*	*M*
Nurturance	5.55	5.60	5.41	5.39
Restrictivness	3.50	3.78	4.41	4.47

Discussion

The purpose of our study was to examine the factor structure of the CRPR-Q that assesses parental child-rearing practices, to determine whether the original factorial structure of this questionnaire is supported by data. This was the first study to investigate the multidimensional factor structure of the CRPR-Q, using CFA and ESEM approaches with bifactor solutions. Globally, the a priori two-factor structure for the CRPR-Q, proposed by Rickel and Biasatti (1982), was supported, and had an acceptable fit in a sample of Portuguese mothers. As hypothesized, the model that best fit the data was the B-ESEM.

The results derived from the B-ESEM model showed that a possible general factor was not well-defined and that a clear differentiation between the two specific parenting factors (nurturance and restrictiveness), was supported. This finding highlighted the multidimensionality of the CRPR-Q. These results are in line with early research drawing from different theoretical frameworks that described parenting practices (Baumrind, 1967, 1971, 1989, 1991; Darling & Steinberg, 1993; Maccoby & Martin, 1983), using two main parenting dimensions referring to warmth and control. In fact, the nurturance factor of the CRPR-Q encompasses parental child-rearing practices favoring warmth and encouragement of children's independence. Conversely, the restrictiveness factor assesses parental child-rearing practices that are related to a more punitive and controlling attitude. Multidimensional measures are particularly interesting, because they can offer a more comprehensive perspective of parenting practices, which are associated with child developmental outcomes, namely cognitive development, externalizing/internalizing problems, school-related socialization, and social competence (Bornstein et al., 2018).

Nevertheless, our findings also revealed the need to control for content specificity in the model, which might reflect the presence of additional domains not covered by the CRPR-Q. This may explain inconsistencies observed in prior studies in the factorial structure of the CRPR-Q, using CFA (Dekovic et al., 1991) and Principal Component Analyses (Chuang et al., 2013; Nunes et al., 2013; Payne & Furnham, 1992). It merits noting that, the CRPR-Q historically derived from a Q-Sort procedure (Block, 1965, 1980); researchers who relied on the Q-sort often selected specific items or factors that corresponded with their interests, and added them to the questionnaire to design their own parenting practices measures. Although some items appeared to be useful for researchers, the contribution of the findings have been unclear, due to the absence of rigorous tests of the factorial structure and psychometric properties of the CRPR-Q.

With respect to measurement invariance, our findings revealed that items and underlying latent factors (nurturance and restrictiveness) were interpreted similarly by mothers, independent of whether their children were boys or girls. These findings are consistent with prior research that did not observed significant differences in parental reports of nurturance and restrictiveness, according to children's sex (e.g., Booth-LaForce et al., 2012; Murray et al., 2014; Payne & Furnham, 1992). Although our findings suggest that the CRPR-Q scores may be meaningfully compared across sexes, we did not observe measurement invariance across children's age groups. Mothers of adolescents (11-15 years) appear to have a different interpretation of parenting practices when compared with mothers of children aged 3 to 10 years, especially for restrictive parenting practices. These results are in line with longitudinal studies, drawing from the CRPR Q-Sort, that found continuity in parenting child-rearing practices related to children's rationale guidance, using praise and reasoning from children's ages 3 to 12 (Roberts et al., 1984) and 7-8 to 15 years (McNally et al., 1991). The increase in restrictive practices across time, which was apparent in our sample, is also consistent with the findings of McNally et al. (1991), who found an increase in maternal control from 13-14 to 15-16 years. However, these results should be confirmed with future longitudinal studies.

This study has limitations that should be addressed. The sample was collected, using convenience sampling procedures, and consisted only of mothers, thus limiting the generalization of the findings. Although no significant differences were found in the psychometric properties of different questionnaires administered online and offline in prior psychological research (Riva et al., 2003), we cannot ignore that data collection procedures differed between mothers of preschool and school-aged children (completion of an online version of the questionnaire) and adolescents (completion of a paper version of the questionnaire). Although our findings were consistent with prior longitudinal research on age-related differences in parenting practices (McNally et al., 1991; Roberts et al., 1984), measurement invariance across age groups needs to be interpreted with caution, because our sample composition allowed us to perform analyses for only two broad age groups (3-10 years *vs.* 11-15 years). Replication of the findings is needed, using not only larger and nationally representative samples involving fathers, but also cross-cultural samples to validate the factor structure of the CRPR-Q at a universal level. In fact, parenting practices are a critical social factor in child development that encompasses cultural norms (Rubin & Chung, 2006), highlighting the importance of cross-cultural studies.

Despite its limitations, this is the first study to focus on investigating the factor structure of the CRPR-Q in a community sample, using statistical tools that allow the clarification of some issues reported in previous studies. The use of ESEM and factorial solutions, such as B-ESEM along with CFA, enables a more in-depth understanding of the underlying relationships among the CRPR-Q items.

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Estrutura mutifactorial do Modified Child Rearing Practices Report Questionnaire (CRPR-Q) numa amostra de mães portuguesas: Uma perspetiva bifactorial

As atitudes dos pais, no processo de socialização da criança, influenciam as suas práticas parentais, a qualidade das relações pais-filhos e o decurso do desenvolvimento das crianças. O Modified Child Rearing Practices Questionnaire (CRPR-Q) tem sido um instrumento amplamente utilizado para avaliar as práticas parentais no decurso do desenvolvimento das crianças. No entanto, os poucos estudos feitos para avaliar a sua estrutura fatorial, originalmente concebida como tendo dois fatores (suporte e restritividade), mostraram resultados inconsistentes e não foi explorada a invariância da medida entre os sexos e as idades. Os objetivos deste estudo foram (1) investigar de forma mais aprofundada a estrutura fatorial do CRPR-Q usando soluções estatísticas bifatoriais (bifator-confirmatory factor analysis [B-CFA] e bifactor-exploratory structural equation modeling [B-ESEM]) e (2) examinar a invariância de medida do CRPR-Q de acordo com o sexo e os grupos de idades das crianças. Uma amostra de 589 mães portuguesas com filhos de idades compreendidas entre os 3 aos 15 anos completou o CRPR-Q. Os nossos resultados revelaram que o modelo B-ESEM é o que melhor se ajusta aos dados. Verificou-se uma clara diferenciação entre os dois fatores estabelecidos *a priori* (suporte e restritividade). No entanto, os nossos resultados sugerem a necessidade de controlar a especificidade do conteúdo e ter uma perspetiva mais ampla em relação ao fator suporte. Foi confirmada a invariância do modelo relativamente ao sexo das crianças, mas não nas diferentes faixas etárias. Estes resultados vêm contribuir para uma compreensão mais aprofundada deste instrumento de medida e da relação subjacente que existe entre os itens que compõe o CRPR-Q.

Palavras-chave: Atitudes e práticas parentais, Modelos bifatoriais das equações estruturais, Invariância da medida, Sexo da criança, Idade da criança.

Submitted: 30/01/2019 *Accepted:* 04/12/2020