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Araújo, Ana Luíza de Carvalho; Martins, Pedro S. R.;
Alvarenga, Marco Antônio Silva; Mansur-Alves, Marcela

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Adaptation and validity evidence of the Child-Adolescent Perfectionism Scale to Brazilian Portuguese

Ana Luíza de Carvalho Araújo[1], Pedro S. R. Martins[1], Marco Antônio Silva Alvarenga[2], and Marcela Mansur-Alves[1]

[1] Department of Psychology, Federal University of Minas Gerais (*Universidade Federal de Minas Gerais, Belo Horizonte* [UFMG])
[2] Department of Psychology, Federal University of São João del-Rei (*Universidade Federal de São João del-Rei* [USFJ])

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Author Note

Ana L. de C. Araújo https://orcid.org/0000-0002-4992-6547
Pedro S. R. Martins https://orcid.org/0000-0002-6555-7649
Marco A. S. Alvarenga https://orcid.org/0000-0002-1168-5733
Marcela Mansur-Alves https://orcid.org/0000-0002-3961-3475

Correspondence concerning this article should be addressed to Marcela Mansur-Alves, Faculdade de Filosofia e Ciências Humanas – Departamento de Psicologia, Avenida Presidente Antônio Carlos, 6627 – Campus Pampulha, Belo Horizonte, Minas Gerais, Brazil, CEP: 31270-901. Email: marmansura@gmail.com

Abstract

This study presents the Brazilian version of the Child-Adolescent Perfectionism Scale (CAPS), one of the most widely used instruments for assessing perfectionism in young people. The objective of this study was to present the adaptation and evidence of validity for the CAPS in Brazilian Portuguese. The study was conducted on 599 adolescents (Mean age = 15.46 SD = 1.15), 66% girls. We investigated CAPS's internal structure, measurement properties according to age and sex, and its relationship with other questionnaires. We found a good fit for a two-factor structure for the CAPS controlling for an acquiescent responding style. We found evidence of invariance across participants' sex and lack of bias (using a MIMIC approach) due to participant age. The CAPS scores were associated with personality traits and a measure of mental health. The CAPS can be used as a questionnaire to assess perfectionism in Brazilian adolescents.

Keywords: perfectionism, adolescent, mental health, personality, factor analysis

ADAPTAÇÃO E EVIDÊNCIAS DE VALIDADE DA CHILD-ADOLESCENT PERFECTIONISM SCALE NO PORTUGUÊS BRASILEIRO

Resumo

O presente estudo apresenta a versão brasileira da Child-Adolescent Perfectionism Scale (Caps), um dos instrumentos mais utilizados para avaliação do perfeccionismo em adolescentes. O objetivo do presente estudo foi apresentar a adaptação e evidências de validade da Caps para o português brasileiro. O estudo foi realizado com uma amostra de 599 adolescentes (média de idade = 15,46 DP = 1,15), 66% meninas. Foi investigada a estrutura interna da Caps, e a relação da medida com idade e sexo, bem como sua associação com outros questionários. Foi encontrado um ajuste aceitável para uma estrutura de dois fatores para a Caps, controlando o estilo de resposta aquiescente. Foi encontrada evidência de invariância de medida entre o sexo dos participantes e ausência de viés (usando uma abordagem MIMIC) devido à idade dos participantes. Houve associação dos escores da Caps com traços de personalidade e uma medida de saúde mental. A Caps pode ser usada como um questionário para avaliar o perfeccionismo em adolescentes brasileiros.

Palavras-chave: perfeccionismo, adolescente, saúde mental, personalidade, análise fatorial

ADAPTACIÓN Y EVIDENCIA DE VALIDEZ DE CHILD-ADOLESCENT PERFECTIONISM SCALE AL PORTUGUÉS BRASILEÑO

Resumen

Este estudio presenta la versión brasileña de la Child-Adolescent Perfectionism Scale (CAPS), uno de los instrumentos más utilizados para la evaluación del perfeccionismo en jóvenes. El objetivo de este estudio fue presentar la adaptación y las pruebas de validez del CAPS en el portugués de Brasil. El estudio se realizó sobre una muestra de 599 adolescentes (Edad media = 15,46 DE = 1,15), 66% niñas. Se investigó la estructura interna del CAPS, las propiedades de medida según edad y sexo, y su relación con otros cuestionarios. Encontramos un buen ajuste para una estructura de dos factores para el CAPS controlador el estilo de respuesta aquiescente. Encontramos evidencia de invariancia entre el sexo de los participantes y falta de sesgo (usando un enfoque MIMIC) debido a la edad de los participantes. Hubo una asociación de las puntuaciones CAPS con rasgos de personalidad y una medida de salud mental. El CAPS podría ser utilizado como cuestionario para evaluar el perfeccionismo en adolescentes brasileños.

Palabras clave: perfeccionismo, adolescente, salud mental, personalidad, análisis factorial

Perfectionism is a multidimensional personality disposition characterized by striving for flawlessness and setting exceedingly high-performance standards. Moreover, it is accompanied by overly critical evaluations of one's behavior (Frost et al., 1990; Hewitt & Flett, 1991). While different conceptualizations of the constituent dimensions have been put forth, the tripartite model by Hewitt and Flett (1991) is one of the most accepted theoretical basis for perfectionism (Smith et al., 2022)depression, eating disorders, suicide, marital problems, and procrastination. Considering that trait perfectionism has intrapersonal and interpersonal aspects, they theorized three dimensions: self-oriented perfectionism (i.e., requiring perfection of the self), other-oriented perfectionism (i.e., requiring perfection of other people), and socially prescribed perfectionism (i.e., the belief that others require perfection of the self).

These three forms of perfectionism have distinct effects on the individual's functioning. In this sense, several studies have related socially prescribed perfectionism to poor psychological adjustment and mental health problems, such as anxiety, depression, bulimic tendencies, suicidal ideation, interpersonal issues, and personality disorders (Ayearst et al., 2012; Chen et al., 2019; Flett et al., 2011, 2014; Hewitt et al., 2014; Smith et al., 2018)complete with its own set of more specific lower order facets. Further, perfectionism in the current proposed system is relevant only to the characterization of the obsessive–compulsive personality disorder type, despite compelling empirical research that demonstrates that various dimensions of perfectionism are differentially associated with personality pathology of all kinds. The present article reviews existing research on the role of various dimensions of perfectionism in personality disorder, highlights these seemingly ignored areas of the perfectionism literature, and discusses the problems and consequences that will arise if perfectionism continues to be defined narrowly and is largely excluded from dimensional models of personality pathology. (PsycINFO Database Record (c. Consequently, it was conceived as encompassing the maladaptive side of perfectionism, what is called perfectionistic concerns (Smith et al., 2022)depression, eating disorders, suicide, marital problems, and procrastination. On the other hand, self-oriented perfectionism is related to several beneficial outcomes - including goal attainment, academic achievement, increased recognition of self-worth, and problem-focused coping - and only to a minor extent to dysfunctional characteristics, such as disposition to early mortality (Damian et al., 2014, 2017; Fry & Debats, 2009; Oros et al., 2017). As a result of the associations between self-oriented perfectionism and positive outcomes, it has been considered an indicator of adaptive perfectionism, referred to as perfectionistic strivings. Finally, other-oriented perfectionism is associated with antisocial characteristics, including Machiavellianism, narcissism, and psychopathy (e.g., Stoeber, 2014; Stoeber et al., 2015). The empirical big-five model has gathered significant interest in recent years. It refers to five personality factors: Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. The dimensions of the big-five model come from a set of traits that are very general in terms of measurement instruments, languages, and analysis methods (Costa & McCrae, 2017).

Besides psychological adjustment associations, perfectionism dimensions usually correlate with other aspects of psychological functioning, such as personality traits. For example, self-oriented perfectionism is associated mainly with conscientiousness, other-oriented perfectionism is linked primarily with low levels of agreeableness, and socially prescribed perfectionism is associated with neuroticism (e.g., Smith et al., 2019). Moreover, Smith et al. (2019) presented meta-analytical evidence that considered collectively that the five personality traits only explained 21% of self-oriented perfectionism, 18% of other-oriented perfectionism, and 30% of socially prescribed perfectionism. Although there seems to be a consistent association between five-factor model traits and perfectionism dimensions, the evidence suggests that multidimensional perfectionism should be considered distinct from these broad personality traits (Flett & Hewitt, 2019; Smith et al., 2022)depression, eating disorders, suicide, marital problems, and procrastination.

Notwithstanding, most of these findings derive from samples of adults. However, there is a growing interest in better understanding how perfectionism develops in childhood and adolescence (Damian et al., 2021; Flett & Hewitt, 2019; Sametoğlu et al., 2021; Smith et al., 2022)personality theories posit that individual differences in general affect may also influence perfectionism. Expecting to find bidirectional relations, this 3-wave study sought to examine the longitudinal interplay between perfectionism and general affect in a sample of 489 adolescents (54% female. Many researchers agree that adolescence is a crucial period to understand how perfectionism is structured and its relationship with different life outcomes precisely because is a period of intense transformations (Damian et al., 2021; Negru-Subtirica et al., 2021). In adolescence, one can observe increased demands and expectations for results in the school and occupational context and greater susceptibility to evaluation and external validation of their actions from significant others. Furthermore, the culture of extreme competitiveness, productivity, and success determined by personal effort observed in industrialized societies has increasingly made adolescents pursue higher goals and standards to achieve social validation (Curran & Hill, 2019; Negru-Subtirica et al., 2021).

There is also a concern regarding the clinical implications of perfectionism in children and adolescents. Perfectionism seems to have predictive power for mental health outcomes in youth. Adolescent perfectionism has been associated with indicators of psychological maladjustment such as depressive and anxious symptoms, somatic complaints, reduced interpersonal functioning, suicide ideation, bullying involvement, and eating disorder (Hewitt et al., 2002; Magson et al., 2019; Roxborough et al., 2012; Vacca et al., 2021)depression, anxiety, stress, and anger were investigated in 114 children (45 males and 69 females, aged 10–15 years. Moreover, perfectionistic concerns are a longitudinal predictor of anxiety symptoms in middle-to-late adolescents over a period of four to five months (Damian et al., 2017) and of depressive symptoms over a period of six months (Levine et al., 2019). In this sense, adequate measures to assess the dimensions of perfectionism in children and adolescents seem pivotal.

One of the most frequent measures used to assess perfectionism in children and adolescents is the Child-Adolescents Perfectionism Scale (CAPS) (Smith et al., 2022; Vicent,

Rubio-Aparicio, et al., 2019)depression, eating disorders, suicide, marital problems, and procrastination. The CAPS is based on the Multidimensional Perfectionism Scale (MPS), developed by the same authors for assessing adult perfectionism (Hewitt & Flett, 1991). The CAPS consists of 22 items, seven negatively written and intended to measure self-oriented and socially prescribed perfectionism (Flett et al., 2001, 2016). The original version of the CAPS showed adequate test-retest reliability (self-oriented perfectionism *r* =.74; socially prescribed perfectionism *r* =.66) and good internal consistency (self-oriented perfectionism α =.85 and socially prescribed perfectionism α =.81).

The CAPS has been adapted in several languages and cultures in several studies with children and adolescents (Vicent, Rubio-Aparicio, et al., 2019). Generally, the original structure of two factors for the CAPS is confirmed (Abdul Kader & Eissa, 2016; Bento et al., 2014; Douilliez & Hénot, 2013; Uz-Baş & Siyez, 2010). Nevertheless, some factor-analytic studies using different analytic strategies have questioned the CAPS's original two-factor structure.

McCreary et al. (2004) indicated that the confirmatory factor analysis for the two-factor model proved an inadequate fit. The exploratory factor analysis suggested three dimensions of perfectionism in 11 and 12-year-old African American students. O'Connor et al. (2009) also applied confirmatory factor analysis for 15 and 16-year-old Canadians and found no evidence for the two-factor model. Ossa-Cornejo et al. (2019) used exploratory factor analysis to set uncorrelated dimensions and find a three-factor solution in Chilean adolescents. Finally, Vicent et al. (2020) and Vecchione and Vacca (2021) also relied on confirmatory factor analysis, finding evidence of a three-factor solution for Ecuadorian and Italian adolescent samples, respectively. All these studies with the CAPS have shown that a three-factor solution, with self-oriented perfectionism split into two facets, provided a better representation of the data. The two self-oriented perfectionism factors encompass a tendency for overly critical self-evaluations accompanied by distress over failure (labeled as self-oriented perfectionism-critical) and a tendency to set high performance standards without associated criticism (labeled as self-oriented perfectionism-striving). In addition to these studies, research on a Chinese sample points to a four-factor solution for the instrument (Yang et al., 2015).

The relationship between gender and indicators of perfectionism appears to be influenced by cultural differences. Research has shown mixed results on gender differences in perfectionism. In the United States, Affrunti et al. (2016) examined gender differences in a sample of U.S. children aged 7 to 13 years, and there were no significant differences in perfectionism according to gender. In Spain, Vicent et al. (2019) work showed more perfectionism in boys (ages 8-11) than in girls (socially prescribed perfectionism, critical self-oriented perfectionism, and self-oriented perfectionism-striving). In Norway, Sand et al. (2021) found slight gender differences in mean levels of general perfectionism and self-oriented perfectionism, while girls scored higher than boys on socially prescribed perfectionism. Thus, it is interesting to assess how perfectionism relates to gender in the Brazilian cultural context. One hypothesis raised is that in Brazil, family upbringing differs with gender, with more substantial parental

pressure on girls than on boys. This privilege for boys is often associated with fewer family demands and housework and sometimes lower societal demands and expectations. However, on the other hand a particular submission within the family is required for girls and increased demands to meet social expectations, characteristic of sexism in many Brazilian communities (Baldwin & DeSouza, 2001).

There seems, therefore, to be a difference in the internal structure of the CAPS between speakers of different languages and with different cultural backgrounds. In Latin America, for example, the scale was only recently adapted in the Spanish-speaking countries of Chile (Ossa-Cornejo et al., 2019) and Ecuador (Vicent et al., 2020). The evidence regarding the CAPS structure in these Latin American countries points to a three-factor solution. However, these countries have Spanish as their native language. Brazil is the only country in Latin America with Portuguese as its native language. The CAPS internal structure was tested on Portuguese speakers only in Europe, and the results confirmed the original two-factor solution (Bento et al., 2014). The adaptation and investigation of the internal structure of the CAPS for Brazilian children and adolescents would make it possible to verify whether the structure found in Brazil would be more like the structure found in native Portuguese speakers or Latin American culture.

In line with the above theoretical framework, this study aims to investigate the evidence of the validity of the CAPS scores. The Brazilian version of the CAPS will be referred to as CAPS-BR. Specifically, we examined the evidence of validity regarding CAPS's internal structure and its relation to other variables (AERA et al., 2014). We expect to replicate the two-factor design observed in earlier studies with Portuguese native speakers (Bento et al., 2014) using confirmatory factor analysis. Furthermore, since the negative-keyed items presented a challenge to scale dimensionality and were kept in the final model as an attempt to control for response biases, we specifically tested the intention of Flett et al. (2016). To quote these authors: "we believe it is important to include some reverse worded items to be able to detect response biases or careless responding and hopefully ensure that children and adolescents are carefully reading and understanding the CAPS items" (Flett et al. 2016, p. 640). However, they did not demonstrably attempt to control for response bias. Although response bias can encompass numerous item response styles (Ziegler, 2015), we focused solely on acquiescence. Acquiescence is the general tendency to agree (or disagree – "disacquiescence") with items regardless of their content (Rammstedt & Danner, 2017). If not controlled, this response style can threaten factorial validity and lead to inaccurate factor loading estimation, especially for personality self-report questionnaires (Rammstedt & Farmer, 2013)or the tendency to respond to descriptions of conceptually distinct personality attributes with agreement/affirmation (acceptance acquiescence.

We then investigated the measurement and structural invariance of the scale between male and female students. To our knowledge, only two studies investigated CAPS invariance between sex. O'Connor et al. (2009) provided data only about the configural and measurement invariance in a sample of Scottish adolescents. Vicent et al. (2020) verified the CAPS factorial invariance between sex in a selection of Ecuadorian adolescents. Both studies found the structure

of the CAPS remained invariant across sex. We also expect an invariant structure in our sample of Brazilian adolescents.

Moreover, we investigated other potential sources of response bias, inspecting possible differential item functioning according to age. We expect no response bias due to respondent age since item content doesn't seem susceptible to be interpreted differently by older or younger adolescents. For example, using the Italian version of the CAPS, one study found that the scale could be considered at least partially invariant at the scalar level across grade levels (Vecchione & Vacca, 2021). Next, we investigated possible mean scores differences for age and sex in the CAPS-BR dimensions.

Finally, the present study also aims to find evidence of validity for the CAPS-BR based on the analysis of the existing correlation pattern with external variables, in our case, personality traits (neuroticism and conscientiousness) and an index of general psychiatric disorder. Meta-analytic evidence suggests that perfectionistic striving (e.g., self-oriented perfectionism) was related to high conscientiousness, whereas perfectionistic concern (e.g., socially prescribed perfectionism) was related to high neuroticism (Smith et al., 2019). These findings have been found, especially in adults (Smith et al., 2019; Strickhouser et al., 2017), but it is still scarce in children (Oros et al., 2017) and adolescents (Stoeber et al., 2009). This is relevant, especially considering that, among the Big Five, conscientiousness and neuroticism are the traits mostly related to important life outcomes (Soto, 2019; Strickhouser et al., 2017)metascientific research has raised questions about the replicability of behavioral science. The Life Outcomes of Personality Replication (LOOPR. Based on the literature, it is hypothesized that self-oriented perfectionism will positively and strongly correlate with conscientiousness, although it may have low and positive correlations with neuroticism. In this study, we selected only neuroticism and conscientiousness since they were the traits most consistently associated with perfectionism (Smith et al., 2019). On the other hand, socially prescribed perfectionism will present only positive correlations with neuroticism. Regarding mental health, as pointed out by several authors (Flett & Hewitt, 2019; Hewitt et al., 2002; Roxborough et al., 2012; Smith et al., 2022; Vacca et al., 2021), we expect to find a positive and moderate correlation of socially prescribed perfectionism with high levels of psychiatric problems and positive, although low correlation, of self-oriented perfectionism with a high probability of psychiatric issues.

Method

Participants

The sample was drawn from a more extensive ongoing study investigating the developmental trajectories of perfectionism among adolescents in Brazil. The present study began with a non-probabilistic sample of 616 adolescents. Participants' protocols were screened for missing data. Forty-one participants had less than 5% missing in their respective rows and had

their data imputed[1] using multivariate imputation through chained equations utilizing the MICE R package (van Buuren & Groothuis-Oudshoorn, 2011). The final sample comprised 599 adolescents (66% girls), with a mean age of 15.46 (SD = 1.15) assessed cross-sectionally. The majority (65%) were from Belo Horizonte (BH), the capital of the state of Minas Gerais and one of the five largest cities in Brazil. Participants were from all social classes (according to the Brazilian criterion, a national standardized questionnaire). However, the majority (58%[2]) was classified as middle class (classes B1 and B2 in the questionnaire). The adolescents were enrolled in 15 schools (85% state-run institutes). Full participants' descriptive information is presented in the supplemental material (https://osf.io/udtxh/).

Instruments

Child-Adolescents Perfectionism Scale ([CAPS] Flett et al., 2001; 2016). The Brazilian version of the CAPS (CAPS-BR). The CAPS questionnaire contains 22 items. Of these, items 3, 9, and 18 are negatively related to the total score. Concerning the two subscales, socially prescribed perfectionism has ten items, and self-oriented perfectionism has 12 items. Answers are recorded using a 5-point Likert-type scale scale (1 – false/not at all true of me, and 5 – absolutely true for me). The scale was adapted following the ITC (2017) guidelines. We took the following steps: (1) items were translated to Portuguese by three bilingual translators; (2) the translated version was presented to 16 adolescents to improve the content; (3) six expert raters reviewed the items on the criteria of semantic, idiomatic, cultural, and conceptual adequacy. The interrater agreement was assessed using the coefficient of content validity (CCV), with values averaged at .94. Suggestions were used to improve item quality. To see all CCV values and the final translation for the CAPS, please refer to the supplementary material (https://osf.io/udtxh/).

Big-Five Inventory ([BFI] Andrade, 2008; John et al., 1991). The Brazilian version of the BFI scale assessed adolescents' personality traits. Specifically, we used only the items for neuroticism (6 items) and conscientiousness (8 items). Answers are recorded using a 5-point Likert-type scale (1 – Disagree strongly; 5 – Agree strongly). This study's alpha reliabilities were adequate: α neuroticism = .86, α conscientiousness = .76.

Self-Reporting Questionnaire 20 ([SRQ-20] Gonçalves et al., 2008; Harding et al., 1980). The Brazilian version of the SRQ was used to screen for participants' mental health disorders. The questionnaire has 20 items. Responses are recorded using a dichotomous scale (0 – no; 1 – yes). This study's alpha reliability for the total score was adequate α = .94.

Procedures

The research was approved by the Research Ethics Committee of the Federal University of Minas Gerais, and it follows the recommendations of the Declaration of Helsinki (approval

1 Little's MCAR test was not significant, supporting the decision to impute their data $\chi^2(330) = 338.28$ $p = .365$

2 This questionnaire was answered by the parents/legal guardians and not all of them completed the instrument, n = 455.

number 1.940.402). The adolescents' parents or guardians signed a letter granting permission for the former to participate in the research. Informed consent was obtained from all individual participants included in the study. Students answered the scales voluntarily and anonymously. The protocol used was a pencil and paper version. Data collection took place between January and July 2019. The data collection was simultaneous and happened in the adolescents' schools. The assessment took approximately 40 minutes.

Data analysis

To investigate the evidence of validity based on CAPS internal structure, we first conducted confirmatory factor analysis (CFA). Specifically, two models were tested: in the first model, we tried to replicate the original dimensionality of the scale, estimating only two latent dimensions (self-oriented perfectionism and socially prescribed perfectionism). The second model was assessed by trying to control for acquiescent responses. Thus, in addition to self-oriented perfectionism and socially prescribed perfectionism, a latent dimension respecting acquiescence was estimated, with all item loadings fixed to 1 (Aichholzer, 2014). Items were treated as ordinal variables using the weighted least squares mean and variance (WLSMV) estimator. The plausibility of model fit was assessed using the following indices: comparative fit index (CFI), Tucker-Lewis's index (TLI), root mean square of error approximation (RMSEA), and standardized root mean square residual (SRMR). Values of CFI and TLI higher than .90 and values of RMSEA and SRMR below .08 were considered acceptable (Kline, 2015). Afterward, we tested the best model for invariance across participants' sex (Putnick & Bornstein, 2016). Three levels of equivalence were tested, configural (same factorial organization), metric (equal factor loadings across groups), and scalar/threshold (equal response thresholds across groups). To consider CAPS as equivalent between groups, we inspected worsening in model fit in CFI and RMSEA values. A ΔCFI lower than -.01 and ΔRMSEA higher than .015 were evidence of equivalence between models (Chen, 2007). Finally, to investigate potential differential item functioning regarding participants' age, we tested a multiple indicators multiple causes model (MIMIC) (Kim et al., 2012). The MIMIC models were estimated in two steps. In the first one, there was a direct path between age and the latent factors self-oriented perfectionism and socially prescribed perfectionism). The second step estimated regression paths between age and CAPS items. For identification purposes, the first item of each factor was set to be invariant (Kim et al., 2012). Finally, to investigate CAPS evidence of validity based on relations to other variables, we explored possible mean differences in self-oriented perfectionism and socially prescribed perfectionism across gender and age. Furthermore, we inspected the correlation between perfectionism, personality traits, and a mental health indicator. All analyses were conducted using R (Team, 2022), using the following packages: lavaan (Rosseel, 2012), emmeans (Lenth, 2021), and boot (Canty & Ripley, 2021). We assumed an alpha level of .05 for all analyses. We used two complementary approaches for power analysis, setting an alpha level of .05 and assuming a power of 80%. For CFA analyses, considering three latent variables (i.e., self-oriented

perfectionism, socially prescribed perfectionism, and the acquiescence factor) and medium overall effect size (δ = 0.3), we would need a sample of 489 people (Soper, 2022). For group comparisons and correlational analyses, we used the *GPower* software (Faul et al., 2007), performing a sensitivity analysis since our data had already been collected. Considering the smallest sample size for each of the analyses, this study had the power to reliably detect effect sizes greater or equal to: Cohen's $d \geq 0.24$, $\eta^2 \geq .02$, and $r \geq .14$. This implies that any effect size lower than previously mentioned would be underpowered, given our current sample size.

Results

Item descriptive statistics are presented in the supplemental material (https://osf.io/udtxh/). The first CFA model (without controlling for acquiescence) showed an adequate fit [χ^2 (208) = 887.40 $p < .001$ χ^2/df = 4.27 CFI = .916 TLI = .906 RMSEA = .074 (90% CI = .069 – .079) SRMR = .072]. However, the latent factor for controlling for acquiescent responses improved model fit [χ^2 (207) = 774.25 $p < .001$ χ^2/df = 3.74 CFI = .930 TLI = .922 RMSEA = .068 (90% CI = .063 – .073) SRMR = .068]. In addition to a two-factor model, we also conducted a CFA model for three factors (splitting self-oriented perfectionism items into self-oriented perfectionism-striving and self-oriented perfectionism-critical, following the general proposition by Vecchione and Vacca (2021). The complete model with three content factors and the control for acquiescent responses showed fit indices very similar to the ones with only self-oriented perfectionism and socially prescribed perfectionism [χ^2 (205) = 759.79 p < .001 χ^2/df = 3.70 CFI = .932 TLI = .923 RMSEA = .067 (90% CI = .062 – .072) SRMR = .066]. However, the self-oriented perfectionism-striving and self-oriented perfectionism-critical factors correlated at .88 $p < .001$. More information on this model is available in the supplemental material. This implies that the two factors were not, in fact, differentiated. Thus, since the fit was essentially the same between the two and three-factor models, and the original two-factor model was more parsimonious (i.e., low correlation between latent factors), the following analyses were conducted using the two-factor model. Factor loadings are shown in Table 1. The estimated correlation between self-oriented perfectionism and socially prescribed perfectionism was significant $r = .37$ $p < .001$. Both factors showed adequate internal consistency according to McDonald's ω (for congeneric models), being .87 for self-oriented perfectionism and socially prescribed perfectionism. Cronbach's alpha was also high for self-oriented perfectionism (.87) and socially prescribed perfectionism (.86).

Invariance testing suggested that the CAPS-BR could be fully invariant across sex at all levels tested. Model fit values were as follows: configural [χ^2(414) = 1010.81 $p < .001$ χ^2/df = 2.44 CFI = .924 TLI = .915 RMSEA = .070 (90% CI = .064 – .075) SRMR = .078], metric [χ^2(434) = 1007.94 $p < .001$ χ^2/df = 2.32 CFI = .927 TLI = .923 RMSEA = .066 (90% CI = .061 – .072) SRMR = .081 Δ CFI = .003 Δ RMSEA = -.003], and thresholds [χ^2(497) = 1125.95 $p < .001$ χ^2/df = 2.26 CFI = .920 TLI = .926 RMSEA = .065 (90% CI = .060 – .070) SRMR = .079 Δ CFI = -.007 Δ RMSEA = -.001]. This suggested that measurement was equivalent for both boys and girls. It

should be noted that the χ^2 difference test was significant only in the comparison between configural and metric model $p = .015$; however, as χ^2 statistics tend to be oversensitive (Putnick & Bornstein, 2016) and CFI increased, we focused on the other fit indexes.

Both MIMIC models showed an acceptable fit, [Model 1 regression paths of age predicting self-oriented perfectionism and socially prescribed perfectionism – $\chi^2(227) = 818.88$ $p < .001$ $\chi^2/df = 3.61$ CFI = .928 TLI = .926 RMSEA = .066 (90% CI .061 – .071) SRMR = .068; Model 2 regression paths of age predicting self-oriented perfectionism, socially prescribed perfectionism, and CAPS items – $\chi^2(207) = 782.20$ $p < .001$ $\chi^2/df = 3.77$ CFI = .930 TLI = .921 RMSEA = .068 (90% CI .063 – .073) SRMR = .068]. To increase the robustness of the results, the second model was fitted using a bootstrap approach, using 1000 re-samples. Bias-corrected confidence intervals suggested that none of the paths were significant. Table 1 presents the factor loadings without any age bias correction (CFA model 2) and correcting for possible age bias (MIMIC model 2). The results are broadly similar.

Table 1

Factor loadings for CAPS with and without control for age effects

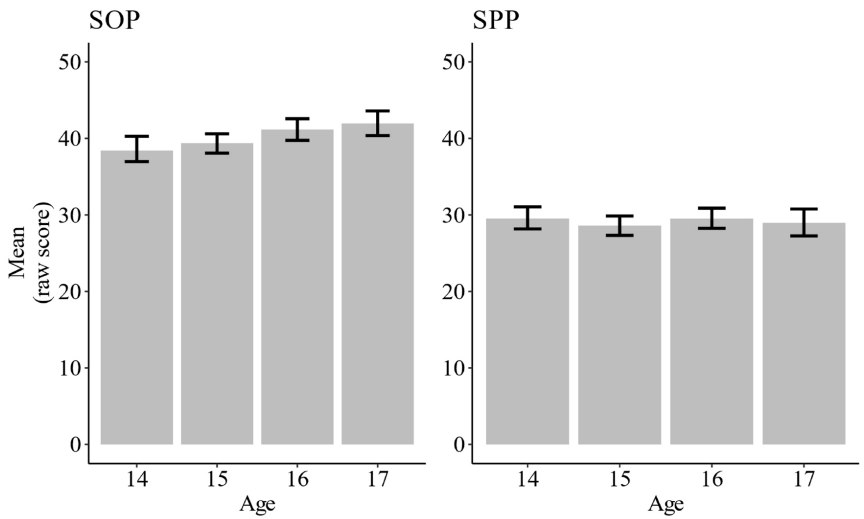
	No correction for age effects (CFA model 2)			Controlling for age effects (MIMIC model 2)		
Item	SOP	SPP	ACQ	SOP	SPP	ACQ
18	-.71		.25	-.73		.25
9	-.54		.25	-.56		.25
6	.34		.25	.36		.25
4	.49		.25	.50		.25
7	.54		.25	.54		.25
20	.54		.25	.54		.25
11	.55		.25	.54		.25
2	.57		.25	.58		.25
1	.60		.25	.60		.25
14	.63		.25	.63		.25
22	.69		.25	.70		.25
16	.75		.25	.75		.25
5		.66	.25		.66	.25
8		.74	.25		.74	.25
10		.57	.25		.58	.25
3		-.33	.25		-.33	.25
12		.57	.25		.57	.25
13		.82	.25		.82	.25
15		.76	.25		.76	.25
17		.40	.25		.40	.25
19		.57	.25		.57	.25
21		.58	.25		.58	.25

Note: SOP: self-oriented perfectionism, SPP: socially prescribed perfectionism, ACQ: acquiescence

All group comparisons were conducted using bootstrap procedures. There was a significant difference between boys and girls for both self-oriented perfectionism [$t(417) = -3.83$ $\Delta M = -2.94$ 95% CI (−4.55 – −1.55) $p < .001$ $d = -0.33$] and socially prescribed perfectionism [t(408) = −3.50 ΔM = – 2.55 95% CI (−3.88 – −1.03) $p = .001$ d = −0.30], indicating higher scores for girls. Descriptive statistics are shown in the supplementary material (https://osf.io/udtxh/). Next, we conducted two one-way ANOVA tests to investigate possible age differences in perfectionism. We excluded the ages 13, 18, and 19 due to the low sample size (n < 20). Therefore, the final N for age comparison was 570. Results suggest a main effect of age for self-oriented perfectionism [$F(3, 566) = 4.08$ $p = .007$ $\eta^2 = .02$], but not for socially prescribed perfectionism [$F(3, 566) = 0.46$ p = .710 $\eta^2 = .00$]. For self-oriented perfectionism, Tukey's post-hoc using bootstrapping procedures suggest differences only between the ages of 14 and 17 [$t(566) = -2.97$ $\Delta M = -3.54$ 95% CI (−5.99 – −1.21) $p = .016$ $d = -0.39$]. Mean scores can be seen in Figure 1.

Figure 1

Cross-sectional age trajectories for perfectionism scores



Note: Error bars indicate the 95% confidence interval.

Finally, we investigated the association between perfectionism and other variables. All correlation coefficients are presented in Table 2. All correlations were significant, except the one between socially prescribed perfectionism and conscientiousness.

Table 2

Correlation among perfectionism, personality traits, and the mental health indicator

Variable	*M*	*SD*	1	2	3	4	5
1. Self-oriented perfectionism	40.13	9.06	1				
2. Socially prescribed perfectionism	29.17	8.51	0.35*** n=599	1			
3. Neuroticism	20.98	6.11	0.19*** n=585	0.26*** n=585	1		
4. Conscientiousness	24.13	5.98	0.42*** n=579	0.01 n=579	-0.17*** n=586	1	
5. SRQ	8.72	5.31	0.25*** n=409	0.44*** n=409	0.64*** n=407	-0.28*** n=405	1

Note: M = mean, SD = standard-deviation

Additional analyses were conducted to investigate possible differences in the latent score of acquiescence. We included age and social class as potential predictors, considering previous studies. There was a significant main effect only for age $F(3, 426) = 2.75$ $p = .043$ $\eta^2 = .02$. Post-hoc suggested that only the comparison between ages 14 and 17 was significant, [$t(426) = -2.64$ $\Delta M = -0.07$ 95% CI (-0.12 - -0.02) $p = .043$ $d = -0.41$]. Older adolescents showed higher means.

Discussion

The central aim of this study was to adapt the CAPS for Brazilian Portuguese. This study used complementary approaches to investigate the instrument's internal factor structure, emphasizing controlling for acquiescent response bias and invariance between sex and age level. To our knowledge, this is the first study to investigate CAPS psychometric properties controlling for acquiescent response bias. In addition, this is the first research to investigate the psychometric properties of CAPS for Portuguese speakers outside Europe.

Confirmatory factor analysis supported the expected two-factor original structure of the scale (comprising self-oriented perfectionism and socially prescribed perfectionism dimensions) (Flett et al., 2001, 2016). Factor loadings were mainly adequate, ranging from -.33 to .82. The two-factor solution for the CAPS was also found in other studies (Abdul Kader & Eissa, 2016; Bento et al., 2014; Douilliez & Hénot, 2013; Uz-Baş & Siyez, 2010) in Turkish, Portuguese, French and Egyptian adolescents, respectively. Importantly, results from CFA revealed that the factorial structure of the Brazilian version of the CAPS presented a good fit for both tested models (with and without acquiescence control). Still, the latent factor for controlling for acquiescent responses improved model fit.

The effect of acquiescent response bias has been shown to impact item factor loadings in personality self-reports (Rammstedt & Farmer, 2013)or the tendency to respond to descriptions of conceptually distinct personality attributes with agreement/affirmation (acceptance acquiescence. Currently, most of the research on acquiescence has focused on the five-factor model of personality

(e.g., Navarro-González et al., 2016; Soto et al., 2008). In this sense, the present study's findings advance the discussion of response biases in perfectionism questionnaires. Even though the impact of acquiescence was relatively small, it should be controlled (Navarro-González et al., 2016). This is particularly significant because some research suggests that this style of response is more pronounced in late childhood/early adolescence (Soto et al., 2008), in people with low/medium education (Rammstedt & Farmer, 2013)or the tendency to respond to descriptions of conceptually distinct personality attributes with agreement/affirmation (acceptance acquiescence, and in different social classes (Meisenberg & Williams, 2008). In this study, however, we did not find significant effects of social class on acquiescence, only for age.

Contrary to expectations, older adolescents had higher acquiescence scores. This may involve motivational aspects of answering questionnaires and contact with the research team, which may be reduced in older adolescents. However, further research should investigate how the pattern of inconsistent responses develops by trying to investigate possible predictors. However, this was outside the scope of this study. Therefore, we agree with Flett et al. (2016) proposal that the negatively keyed items are essential and should be kept in the scale, enabling acquiescence control. Additionally, we expect that future studies will investigate other types of response bias to fully address the assertion of Flett et al. (2016) that the CAPS items are not answered based on anything less than their content. For example, the impact of social desirability could be controlled by changing the organization of the scale and adding specific indicators (Navarro-González et al., 2016).

The present study also points to reasonable levels of internal consistency for self-oriented perfectionism and socially prescribed perfectionism in our sample. According to the meta-analysis of the instrument carried out by Vicent et al. (2019), the average CAPS reliability observed was.83 for self-oriented perfectionism and .84 for socially prescribed perfectionism. The values found in this study were very similar to those found in the instrument's meta-analysis, which again indicates that they are satisfactory values and within the range of the averages that the studies found.

There is a pressing need for more diverse samples to investigate the structure of perfectionism (Smith et al., 2022)depression, eating disorders, suicide, marital problems, and procrastination. The replication of the original factor of the CAPS raises questions that could be further explored in cross-cultural comparisons with other countries. For example, if the structure found for the CAPS in Brazilian adolescents shows, in fact, measurement invariance with other countries. However, it should be mentioned that the lack of fit for a two-factor solution in other studies could be partially explained by contextual factors and the estimator choice for running factor analysis (Li, 2016)unweighted least squares (ULS. Considering that the CAPS items are ordinal, using estimators and correlation methods with normality as an assumption may impact the results (Li, 2016)unweighted least squares (ULS. Therefore, it is impossible to thoroughly compare contextual factors among different studies since various methodologies were employed. However, in one of the studies that found evidence in favor of a three-factor solution, the

sample was younger than the one used in this study (McCreary et al., 2004). This could suggest that the differentiation of perfectionism dimensions could follow a developmental trend in which, in older adolescents, the dimensions are better differentiated. In studies with samples similar in age to ours (O'Connor et al., 2009; Ossa-Cornejo et al., 2019; Vecchione & Vacca, 2021; Vicent et al., 2020) several factors may also explain the differences, as lack of control for response quality or response bias.

Nevertheless, some cultural values may also impact the manifestation of perfectionism in different countries. For instance, mean differences and lack of measurement invariance have been suggested to be associated with differences in collectivistic and individualistic values (Arana et al., 2018)Mobley, Trippi, Ashby, & Johnson, 1996. In a study with adults, Arana et al. (2018) Mobley, Trippi, Ashby, & Johnson, 1996 suggested that countries with higher levels of individualism values also tend to show higher means of perfectionism striving. The emergence of an independent dimension of perfectionism striving (i.e., self-oriented perfectionism-striving) could be related to the cultural values in some countries that found a three-factor solution.

As a next step, we investigated the measurement invariance of the scale between sex and age levels. Findings provided evidence of configural, metric, and scalar invariance of the CAPS between sex and age, as we hypothesized. Sex invariance of the CAPS structure was also found by O'Connor et al. (2009) in Scotland and by Vicent et al. (2020) in Ecuador. Furthermore, Vicent et al. (2020) pointed out that the structure of the CAPS remained invariant across ages in Ecuadorian adolescents until 18 years old. A finding of invariance between sex and age for the CAPS is essential because it implies the instrument can be used to compare perfectionism levels between girls and boys and between different ages throughout adolescence.

Considering the structural invariance of CAPS between sex and age, we performed comparisons to identify differences in the levels of perfectionism by sex and age. Results found higher levels of perfectionism for girls in both dimensions, while older adolescents had higher levels only for self-oriented perfectionism. Regarding differences according to sex, our results don't' coincide with previous literature on CAPS. In the study conducted by Vicent et al. (2020), males obtained higher latent means only on self-oriented perfectionism than females. Douilliez and Hénot (2013) found significant differences in both socially prescribed perfectionism and self-oriented perfectionism, whereas Flett et al. (2016) and McCreary et al. (2004) found differences only in socially prescribed perfectionism. In all these studies, boys obtained higher averages on perfectionism than girls, while the present study points in the opposite direction. Regarding age, our results are similar to those of other studies, such as Douilliez and Hénot (2013) and Vicent et al. (2020), who found that older students reported higher scores than younger ones in self-oriented perfectionism but not in socially prescribed perfectionism.

Cultural differences could explain the higher female means in both dimensions of perfectionism in our study since the present study is the only one conducted in a Portuguese-speaking developing country (Curran & Hill, 2019). They might also be due to the methodology used, since no previous study, except for the one by Vicent et al. (2020), analyzed the latent

means scores. It appears that age differences are more consistent across cultures. Higher levels of self-oriented perfectionism in older adolescents may be linked to greater expectations and social pressure to succeed when leaving high school, to enter the job market or university. Negru-Subtirica et al. (2021), self-oriented perfectionism has been longitudinally linked to academic achievement, with high academic achievement predicting relative increases in self-oriented perfectionism and vice versa. Consequently, we might be able to explain the higher levels of self-oriented perfectionism but not socially prescribed perfectionism in older adolescents. However, it should be noted that more well-powered studies should further investigate these age differences. As highlighted in Figure 1, most confidence intervals overlap.

Evidence of validity based on the relationship with external variables was found using correlations with measures of conscientiousness and neuroticism personality traits. As expected, self-oriented perfectionism was positively related to conscientiousness and neuroticism. However, the correlation with conscientiousness was higher than neuroticism, and socially prescribed perfectionism was positively related only to neuroticism. This finding is in line with most of the literature suggesting that perfectionistic strivings (in the case of our study, self-oriented perfectionism) usually have the most significant correlations with conscientiousness (Smith et al., 2019; Strickhouser et al., 2017; Vecchione & Vacca, 2021). This conceptual confluence between conscientiousness and perfectionistic strivings is not surprising, considering that one of the facets of conscientiousness is achievement striving (i.e., striving for excellence), a fundamental characteristic of perfectionist standards (Smith et al., 2022)depression, eating disorders, suicide, marital problems, and procrastination.

Similarly, the positive and significant associations between Neuroticism and self-oriented perfectionism and socially prescribed perfectionism dimensions were also expected (Stricker et al., 2019; Vecchione & Vacca, 2021). High levels of self-oriented perfectionism involve excessive worrying about failure, and severe and persistent self-criticism, whereas high levels of socially prescribed perfectionism are tied to an excessive worry over other people's evaluations and judgments, overpressure, and demands from third parties, low tolerance to critic, and high levels of performance anxiety (Oros et al., 2017; Stricker et al., 2019). In this sense, perfectionistic concerns are aligned with the image of highly neurotic individuals: emotionally unstable, insecure, susceptible to stress, and negative emotions.

We also investigated the associations between perfectionism and mental health. We found that both perfectionism dimensions were positively associated with SRQ (a general psychiatry disorder index), although the association with socially prescribed perfectionism was higher than with self-oriented perfectionism. This result is consistent with several findings in the field (Damian et al., 2014, 2021; Flett et al., 2011, 2014; Hewitt et al., 2014; Smith et al., 2022). While the literature shows a consistent positive association between socially prescribed perfectionism and adverse mental health outcomes, negative mental health outcomes associated with self-oriented perfectionism are less consistent and with a low magnitude, despite being common.

According to what has been exposed thus far, our findings indicate that the Brazilian version of the CAPS can confirm the results of international studies with other versions of the instrument. This shows that the Portuguese version has evidence of internal and external validity; hence it appears suitable for perfectionism assessment among Brazilian adolescents. Besides that, the present study has some limitations. First, the scale was translated into Brazilian Portuguese, and we did not have the opportunity to test the equivalence with the original English form. Future studies should assess the measurement invariance of the scale across languages. An additional potential drawback is the results apply only to adolescents since our sample did not include children. Therefore, the findings may not be generalizable to children yet. Future studies could benefit from the analysis of the CAPS structural invariance when comparing children and adolescents. Otherwise, the results suggest that the impact of the acquiescent response is moderate to low. Since this study was the first to investigate acquiescence in CAPS, we could not compare our results with those of other studies. Nevertheless, the impact of acquiescence should be further explored.

Despite these limitations, the CAPS may prove a valuable tool in estimating the prevalence of perfectionism among Brazilian adolescents. The assessment of perfectionism in the clinical setting is essential because of the threat perfectionism poses to adolescents' mental health. Thus, this study is vital for future research as it has practical applications for mental health professionals. Additionally, this study is expected to increase research on this topic in Brazil, supporting further investigation of the perfectionism nomological network, and allowing for development beyond Western or developed countries.

Data availability statement

Data and code supporting the findings of this study are available in the OSF repository https://osf.io/udtxh/.

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