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# Psychometric Properties of the Hewitt and Flett Multidimensional Perfectionism Scale in Brazilian Adults

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**ABSTRACT –** The aim of the present study was to investigate validity evidence based on internal structure and the relationship with other variables of the Brazilian version of the Hewitt and Flett Multidimensional Perfectionism Scale (H&F-MPS). To this end, a sample comprising 368 participants with a mean age of 31.17 years (SD=11,34), 74% female, answered the H&F-MPS perfectionism scale and instruments that measure personality and psychological inflexibility. Findings indicated a factor structure of three dimensions, like the original scale, good discriminative item parameters, highly satisfactory reliability indexes, and significant correlations of the hypothesized directions with Openness to Experiences, Neuroticism, and Conscientiousness factors from the personality measure, as well as with the psychological flexibility measure.

**KEYWORDS:** multidimensional perfectionism, personality, psychometric properties

# Propriedades Psicométricas da Escala Multidimensional de Perfeccionismo de Hewitt e Flett para Adultos Brasileiros

**RESUMO –** O objetivo do presente estudo foi levantar evidências de validade da estrutura interna e da relação com outras variáveis para a versão brasileira da Escala Multidimensional de Perfeccionismo de Hewitt e Flett (H&F-MPS). Para isso, uma amostra composta por 368 participantes com média de idade de 31,17 anos (DP = 11,34), sendo 74% do sexo feminino, respondeu à escala de perfeccionismo H&F-MPS e a instrumentos que mensuram a personalidade e a inflexibilidade psicológica. Os resultados apontaram uma estrutura fatorial com três dimensões semelhante à escala original, bons parâmetros de discriminação dos itens, índices muito satisfatórios de confiabilidade e correlações significativas na direção esperada com os fatores abertura à experiência, neuroticismo e conscienciosidade da medida de personalidade e com o instrumento de inflexibilidade psicológica.

**PALAVRAS-CHAVE:** perfeccionismo multidimensional, personalidade, propriedades psicométricas

Perfectionism is understood as a multidimensional characteristic of personality, in which the individual defines goals/aims with overly high standards of performance and a strong eagerness to perform activities in an exceptional way (Frost et al., 1990; Stoeber, 2018). Furthermore, perfectionist individuals are overly critical of their own behavior, fear negative evaluation, are preoccupied with mistakes and failures, and show excessive control over their thoughts and feelings (Flett et al., 2016).

According to Hewitt and Flett (1991), perfectionism comprises both intrapersonal and interpersonal aspects and is subdivided into three dimensions, namely: (1) Self-Oriented Perfectionism (SOP), regarding the setting of extremely high standards and excessive criticism towards

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one's own performance; (2) Other-Oriented Perfectionism (OOP), involving severe and intense criticism within one's interpersonal relationships, and imposition of their (high) standards of performance to others; and (3) Socially Prescribed Perfectionism (SPP), in which there is a perception that society and other people demand one to be perfect. In view of this conception, and in order to operationalize this model, the authors have developed the Hewitt and Flett Multidimensional Perfectionism Scale (H&F-MPS), which was translated into Brazilian Portuguese as *Escala Multidimensional de Perfeccionismo de Hewitt e Flett*.

H&F-MPS was elaborated in the context of a shortage of instruments to evaluate perfectionism in a multidimensional manner. Beyond that, H&F-MPS helped overcome the limitations of other instruments, such as response biases and lack of scales that were adequate to the clinical context (Hewitt et al., 1991). In their original study (Hewitt & Flett, 1991), the authors performed a principal component analysis and then a scree plot test that indicated three factors, accounting for 36% of the variance. There were also item-to-subscale correlations ranging between .51 and .73 for SOP, .43 and .64 for OOP, and .45 and .71 for SPP. Moreover, there were intercorrelations among the subscales ranging between .25 and .40. Perfectionism was also correlated with variables of academic outcomes, personality, and, especially, clinical variables. Regarding social desirability, there were correlations between the scale used to measure desirability and the dimensions OOP ($r$ = -.25, $p$ < .05) and SPP ($r$ = -.39, $p$ < .01).

H&F-MPS is one of the most used scales to evaluate perfectionism in many countries (Lombardo et al., 2021), given the instrument has versions that are adapted to different languages and cultures, for example, the Portuguese (Soares et al., 2003), Spanish (Campayo et al., 2009), and Dutch (De Cuyper et al., 2015) populations. In the studies for the Portuguese (Soares et al., 2003) and Spanish populations (Campayo et al., 2009), the authors of both works have investigated the factor structure of the scales using principal component analysis with varimax rotation, and the three factors found in the original study (Hewitt & Flett, 1991) were maintained, although four items (29, 37, 38, and 45) were removed, leaving 41 items in the final Portuguese version, whereas the Spanish version was established with the original 45 items. The authors of the Spanish version also investigated the convergent validity between H&F-MPS and the Eating Disorders Inventory (EDI) perfectionism subscale, and the association values found were: $r$ = .61 for SOP, $r$ = .57 for SPP, and $r$ = .33 for OOP, with $p$ < .001 in all cases.

In the process of validating the scale for the Dutch population, De Cuyper et al. (2015) performed a confirmatory factor analysis that indicated adequate fit to the model with three factors and 45 items, with the following obtained values: Satorra-Bentler scaled $\chi^2$ 6,437.74, Comparative Fit Index (CFI) = .91, Root Mean Square Error of Approximation (RMSEA) = .08, and Standardized Root Mean Square Residual (SRMR) = .08. The study also verified convergent validity with the Frost Multidimensional Perfectionism Scale (F-MPS; Frost et al., 1990). With the total score of F-MPS, correlations were of $r$ = .68 for SOP, $r$ = .67 for PSP, and $r$ = .39 for OOP, with $p$ < .01 in all cases. There were also significant correlations with the dimensions of the scales, varying between .21 and .76 ($p$ < .001) for SOP; between .08 ($p$ < .05) and .59 ($p$ < .001) for SPP; and between .15 and .37 ($p$ < .001) for OOP. In all of the three studies, internal consistency indexes, measured by different procedures, achieved satisfactory and/or very satisfactory levels among the three dimensions of H&F-MPS.

In the Brazilian context, Diehl and Barbosa (2016) verified initial evidence on the content validity of the scale. After translation and semantic adaptation, expert judges examined the criteria of clarity and relevance of the Brazilian Portuguese version, and results were satisfactory (CVC = .894 [clarity] and .901 [relevance]). However, it should be noted that this was a content validity study, without investigation of construct and external validity of the instrument.

Aside from the studies of internal structure validity and of the relationship with some variables of the perfectionism scales, the literature has consistently pointed out the relation between the dimensions of perfectionism and personality traits. Findings demonstrate that perfectionism is significantly correlated to personality traits (Fowler et al., 2018; Smith et al., 2019). More specifically, SOP and SSP are associated with Neuroticism (correlations ranging from .297 to .430; and from .380 to .384, in both cases $p$ < .01), OOP is associated with Agreeableness (correlations ranging from – .183 to – .207, at $p$ < .05) (Holden, 2019; 2020), and SOP is associated with Conscientiousness (correlations ranging from .12 to .40, with $p$ < .01) (Træen et al., 2019; Walton et al., 2018). Furthermore, some studies have indicated a negative relation between Extraversion and SPP (correlations varying from – .16 to – .23, with $p$ < .01) (Holden, 2019; Stoeber, 2014a). Also, Stricker et al. (2019) conducted a meta-analysis to investigate how the dimensions of perfectionism related to the dimensions of the Big Five model. Specifically, regarding the Hewitt and Flett model, results point to correlations between the dimensions of perfectionism and personality traits. The SPP dimension correlated with Extraversion ($r$ = .172), Agreeableness ($r$ = .243), and Neuroticism ($r$ = .300), and the SOP dimension correlated with Openness to Experiences ($r$ = .052), Extraversion ($r$ = .012), Agreeableness ($r$ = – .051) and Neuroticism ($r$ = .120). In the first paragraphs, we mentioned how there are different types of perfectionism, and so the correlations have different directions because they reflect different aspects of perfectionism. Although correlations between perfectionism and all the big five traits are found, a variety of studies have found that conscientiousness and neuroticism are most consistently associated with perfectionism (Fowler et al., 2018; Smith et al., 2019; Stricker et al., 2019; Walton et al., 2018). In general, perfectionist concerns (in the present

study represented by the SPP dimension) tend to be positively associated with neuroticism, while perfectionistic strivings (in the present study represented by the SOP dimension) are positively associated with conscientiousness.

Besides personality traits, perfectionism is, from a theoretical perspective, associated with a greater psychological rigidity/inflexibility. In its most rigid form, or at excessively high levels, perfectionism is an obstinacy towards everything happening in an exquisite, perfect way, and without any flaws, defects or mistakes related to one's or others' performance (American Psychiatric Association, 2013; Smith et al., 2016). In a similar fashion, psychological inflexibility is a form of functioning in which the individual presents a dysfunctional persistence/excess of control over feelings, thoughts, and behaviors (Tanhan, 2019). People with high psychological inflexibility experience events with low openness and in a rigid way (Arslan & Allen, 2021), and are more likely to exhibit psychological, behavioral, and social issues (Tanhan, 2019).

Given the above discussion, conceptual and empirical understanding of perfectionism has been sought and, to this end, measurement instruments have been developed or adapted (Flett & Hewitt, 2016). It must be stressed that it is of great importance that these instruments have good psychometric evidence, ensuring, thus, the interpretations and the form of use of the scale, according to recommendations presented in the American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (AERA, APA, & NCME, 2014). Considering that H&F-MPS is one of the most widely used instruments for perfectionism measurements (Lombardo et al., 2021), and that there are no validity evidence – apart from content validity – and reliability evidence for the scale for the Brazilian adult population, the present study has the goal of presenting validity evidence on the Hewitt and Flett Multidimensional Perfectionism Scale (H&F-MPS) for Brazilians adults, by means of an analysis of internal structure, reliability indexes, and relation to external measurements (personality traits and psychological inflexibility). It is worth highlighting that a scale that measures perfectionism with adequate psychometric qualities can contribute to a better investigation, understanding, and intervention design over several psychological aspects. The literature has been pointing out that perfectionism has been able to predict the occurrence of many negative outcomes. Previous studies have pointed towards negative impact of perfectionism in mental and physical health (for example, injuries and high levels of anxiety), and social outcomes (for example, impostor phenomenon and toxic family relationships) in several populations, such as athletes (Olsson et al., 2020), dancers (Pentith et al., 2021), college students (Lee et al., 2020), musicians (Butković et al., 2021), among others. Besides that, it should be noted that it is of great importance to study perfectionism in view of its relationship with mental health outcomes, that is, its associations with several psychopathologies (Kothari et al., 2019). Previous studies have demonstrated associations with eating disorders (Vanzhula et al., 2021), obsessive-compulsive personality disorders (Sametoğlu et al., 2021), anxiety, depression (Tyler et al., 2020), post-traumatic stress disorder (Cohen & Zerach, 2020), among others, and perfectionism has further presented correlations with suicidal ideation (Robinson et al., 2021). Together, these findings point towards the relevance of the present study in the national context.

## METHOD

### Participants

The sample in the present study comprises 368 participants with an average age of 31.17 years old (SD = 11.34), age range 17 to 67, 74% female, 25% male, and 1% declared non-binary. Predominantly, participants were single (63.5%) or married/in a stable union (29%). Regarding educational level, participants with incomplete higher education represented 32% of the sample, participants with postgraduate degrees (Master's and PhD) represented 33%, with Specialization, 15%, with complete higher education, 13%, and complete high school, 7%. Of all the participants, 65% declared themselves white; 20%, brown; 8%, black; and 7%, from other ethnicities. The family income declared by 30% of the participants was of more than ten minimum wages (more than R$11,000), 20% declared an income of six to ten minimum wages (R$6,600 to R$11,000), 18% declared an income of three to four minimum wages (R$3,300 to R$4,400), 14% declared income of one to two minimum wages (R$1,100 to R$2,200), 9% declared an income of four to five minimum wages (R$4,400 to R$5,500) and the same percentage (9%) declared an income of five to six minimum wages (R$5,500 to R$6,600). It should be noted that this was a convenience sample.

### Instruments

*Escala Multidimensional de Perfeccionismo de Hewitt e Flett* (Hewitt & Flett, 1991): this Brazilian Portuguese version of Hewitt and Flett Multidimensional Perfectionism Scale (H&F-MPS) is a self-report measure that operationalizes the three dimensions of Hewitt and Flett's perfectionism model, namely: Self-Oriented Perfectionism (SOP), Socially Prescribed Perfectionism (SPP), and Other-Oriented Perfectionism (OOP). Self-Oriented Perfectionism concerns the setting of unrealistic standards and the perfectionist motivations directed to the self; Socially Prescribed Perfectionism is associated with the belief that significant

others expect perfection from oneself; and Other-Oriented Perfectionism relates to the existence of unrealistic standards and perfectionist motivations towards others. There are 45 items on this scale, 15 for each dimension, answered through a Likert scale that ranges from 1 (*strongly disagree*) to 7 (*strongly agree*). Items 2, 3, 4, 8, 9, 10, 12, 19, 21, 24, 30, 34, 36, 37, 38, 43, 44, 45 have inverted scores, such that higher total scores in each of the three dimensions' subscales indicate higher levels of perfectionism**1**.

*Inventário dos Cinco Grandes Fatores de Personalidade* (IGFP-5 – Andrade, 2008): it is the Brazilian version of the Big Five Inventory (BFI, John et al., 1991). It has been adapted to Portuguese, and its Brazilian version has 44 items distributed between the five big factors of personality, Openness to Experiences, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Reliability coefficients range from .68 to .60 (Guttman's lambda-2). The items are answered through a Likert scale ranging from 1 to 5 (1 = *totally disagree*, 5 = *totally agree*). A higher score indicates a higher level of the personality trait. In the present study, 8 items from the Neuroticism subscale, 10 items from the Openness to Experiences subscale, and 8 items from the Conscientiousness subscale were considered, totaling 26 items. The decision of selecting these dimensions was made based on studies suggesting a greater level of robustness for the relation between these three personality traits and perfectionism dimensions (Stricker et al., 2019). Within the study's sample, reliability coefficients were the following: Neuroticism, Cronbach's alpha (α = .87; 95% CI [.85-.89]), and McDonald's omega (ω = .87; 95% CI [.85-.89); Openness to Experiences, Cronbach's alpha (α = .68; 95% CI [.63-.73]), and McDonald's omega (ω = .62; 95% CI [.57-.68); and Conscientiousness, Cronbach's alpha (α = .81; 95% CI [.78-.84]), and McDonald's omega (ω = .82; 95% CI [.79-.84]).

*Escala de flexibilidade psicológica* Acceptance and Action Questionnaire-II (AAQ-II, Bond et al., 2011): it is a self-report scale which aims to assess psychological inflexibility, as per the clinical model of the Acceptance and Commitment Therapy (ACT), which understands that psychological inflexibility is associated with dysfunctionality and, consequently, to psychopathological functioning. The Brazilian Portuguese version of AAQ-II (Barbosa & Murta, 2015) is comprised of 7 items, answers are provided through a 7-point scale ranging from 1 (*never*) and 7 (*always*), and final scores lie between 7 and 49, with higher scores in the instrument being indicative of higher levels of psychological inflexibility. Barbosa and Murta's study (2015) demonstrates that the internal consistency of the instrument is acceptable (Cronbach's alpha = .87) and shows elevated factor loadings for all 7 items over the single retained dimension of the conducted exploratory factor analysis. Within the current study's sample, reliability indexes were of a very high Cronbach's alpha (α = .93; IC 95% [.92-.94]) and a very high McDonald's omega (ω = .93; IC 95% [.92-.94).

Socio-demographic questionnaire: a social and demographic characterization questionnaire was exclusively developed for the present study. It consisted of questions regarding age, gender, educational level, marital status, and others.

## Data Collection Procedures

Instruments employed in the present study were part of a larger research protocol developed to build up information and evidence of validity and reliability for different measures of perfectionism for the Brazilian population. The complete protocol was online-based and elaborated through the Research Electronic Data Capture (REDCap) platform, as made available by the Federal University of Minas Gerais. The protocol link was distributed using social media outreach (Whatsapp, Instagram, and Facebook), and sent to electronic addresses registered at Federal University of Minas Gerais official website as from people interested in participating in research conducted by the lab. To take part in the study, participants had to be 18 years old or older and sign a Free and Informed Consent Form (TCLE), which confirmed their understanding of the project's main goals, as well as participation risks and benefits. The completion of the protocol took an average of 25 minutes. Data collection took place between July and August 2021. The research project was approved by Research Ethics Committee of Federal University of Minas Gerais (reference number 1.974.928).

## Data Analysis Procedures

Descriptive analyses of frequency, percentages, means, and standard deviations were calculated to characterize the sample, and inferential analyses were conducted to verify evidence of validity based on the internal structure and on the relationship between variables, specifically, the convergent validity. Factor Analyses were performed on the software FACTOR, version 11.05.01 (Ferrando & Lorenzo-Seva, 2017), and descriptive, internal consistency, and correlation analyses were conducted on the software JASP, version 0.15.

### *Evidence of validity based on internal structure*

1) Exploratory Factor Analysis (EFA): a dispersion matrix was generated using polychoric correlations, and Kaiser-Meyer-Olkin (KMO) and Bartlett's statistical significance (Test of Sphericity) indexes were used to verify factorability and sample adequacy. The extraction method used was Robust Diagonally Weighted Least Squares (RDWLS – Asparouhov & Muthen, 2010), and ≥ .30 standardized factor loadings were considered. To determine the number of factors, parallel analysis with random permutation of observed data was used (Timmerman & Lorenzo-Seva, 2011), and the Robust Promin rotation method (Lorenzo-Seva & Ferrando, 2019)

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was applied. Model fitness was assessed with the following adjustment or fit indexes: Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Non-Normed Fit Index (NNFI), and Goodness of Fit Index (GFI). According to literature (Brown, 2006), RMSEA values must be under .08, CFI and TLI values must be over .90 or, preferably, .95, and NNFI and CFI over .90. Factor stability was assessed with the H index, which varies from 0 to 1, and high values > .80 suggest stability across studies (Ferrando & Lorenzo-Seva, 2018). 2) Item analysis: the discrimination parameter and the items' thresholds were checked using Reckase's parametrization (Reckase, 1985). 3) Internal consistency: measured with Cronbach's alpha and Mcdonald's omega (≥ .60 to be considered satisfactory) over dimensions and, additionally, a Composite Reliability coefficient was calculated (Valentini & Damásio, 2016; Raykov, 1997).

#### *Evidence of validity based on the relationship with other variables (convergent validity)*

As the Shapiro-Wilk test showed deviation from normality (W = 0.98; p < 0.0001), Spearman correlation (rho) was used to verify the associations between scores in the dimensions of the perfectionism scale (SOP, OOP, and SPP), the personality scale scores (Conscientiousness, Openness and Neuroticism), and the AAQ-II psychological inflexibility scale scores. Correlations were interpreted considering coefficients from .00 to .19 as low, from .20 to .39 as weak, from .40 to .69 as moderate, and over .70 as strong (Field, 2018).

## RESULTS

### Evidence of validity based on internal structure

Initially, the internal structure of the items was investigated using Exploratory Factor Analysis (EFA), from which Bartlett's sphericity tests (4043,0; *df* = 990, *p* < .001) and KMO (.90) suggested interpretability of the items' correlations matrix. Parallel analysis indicated a four-factor configuration for the H&FMPS data, and 2 items did not present relevant factor loadings (i.e., were <.30): item 36 ("*I don't have very high standards*"), and item 37 ("*My parents rarely expected me to be excellent on everything*"). Fitness indexes were RMSEA = .02, CFI = .98, TLI = .97, NNFI = .998, and GFI = 1.00, considered adequate. Nevertheless, some items loaded on theoretically inadequate dimensions. For instance, items 26 and 29, which operationally represent the OOP dimension, had factor loadings over SOP and SPP, respectively. Another item, 25, which operationally represents the SPP dimension, was grouped together with a majority of items from the OOP dimension.

Given this composition of factors, another factor analysis with the same configurations was conducted, but this time the number of estimated factors was fixed at 3 factors (see Campayo et al., 2009; De Cuyper et al., 2015; Soares et al., 2003). The assessment of the items composition of the 3 factors revealed that all but three of the items with a significant factorial loading (≥ .30) were grouped in accordance with their operational and theoretical conceptualization, as they were initially proposed. Table 1 shows factor loadings of this new model (the complete Portuguese version of the scale is available upon request to the first author of this study through the first author e-mail address).

As displayed on Table 1, three items did not present significant factor loadings (≥ .30): items 29, 36, and 37; and two items showed a pattern of cross-loadings, namely, items 26 and 39. To determine which was the most adequate factor for each of these cross-loadings' items, Pratt's Importance Measures was calculated (Wu & Zumbo, 2017). Item 26 showed a value of .486 for Factor 2, and showed a value of .508 for Factor 3, and thus was included in Factor 3. Item 39 showed a value of .617 for Factor 1 and of .457 for Factor 3, and thus was included in Factor 1. Only the inclusion of item 39 in its respective factor has corroborated theoretically-derived expectations. Fit indexes for the three-factor solution were also adequate (RMSEA = .03, CFI = .99, TLI = .99, NNFI = .991, and GFI = 1.00). The replicability measure for the factor structure (*H-index* – Ferrando & Lorenzo-Seva, 2018) suggested all indexes might be replicated on future studies (H > .80; Factor 1 = 1.0, Factor 2 = .92, Factor 3 = 1.0).

After the EFA, discrimination parameters and items' thresholds were assessed using Item Response Theory (IRT) for all items**2**. The most discriminative item of Factor 1 was item 41 (*a* = 1.570), that of Factor 2 was item 10 (*a* = 1.145), and of Factor 3, it was item 5 (*a* = 2.867). When considering the instrument overall, item 15 was the most discriminative. As for the items' thresholds, there was no indication of any unexpected pattern of responses, such that the higher the category of scale response, the higher the level of latent trait to support it. Finally, H&FMPS' internal consistency showed good indexes: Factor 1 Cronbach's alpha (α = .89; 95% CI [.88-.91]) and McDonald's omega (ω = .90; IC 95% [.88-.91) indexes; Factor 2 Cronbach's alpha (α = .77; 95% CI [.74-.80]) and McDonald's omega (ω = .78; 95% CI [.75-.88); and Factor 3 Cronbach's alpha (α = .93; 95% CI [.92-.94]) and McDonald's omega (ω = .93; 95% CI [.93-.94). As for the composite reliability, Factor 1 = .918, Factor 2 = .841, and Factor 3 = .953.

**2** Tables with information on discrimination values and items' thresholds are available upon request to the first author of this study.

Table 1
*Factor Loadings and Factors' Items Composition*

| Dimension | Factor 1 (SPP) | Factor 2 (OOP) | Factor 3 (SOP) |
|---|---|---|---|
| spp_5 | 0.765 | | |
| spp_9 | 0.746 | | |
| spp_11 | 0.499 | | |
| spp_13 | 0.589 | | |
| spp_18 | 0.551 | | |
| spp_21 | 0.648 | | |
| spp_30 | 0.787 | | |
| spp_31 | 0.879 | | |
| spp_33 | 0.690 | | |
| spp_35 | 0.744 | | |
| spp_39 | **0.521** | | 0.314 |
| spp_41 | 0.872 | | |
| spp_44 | 0.459 | | |
| oop_2 | | 0.483 | |
| oop_3 | | 0.462 | |
| oop_4 | | 0.530 | |
| oop_7 | | 0.451 | |
| oop_10 | | 0.780 | |
| oop_16 | | 0.470 | |
| oop_19 | | 0.496 | |
| oop_22 | | -0.370 | |
| oop_24 | | 0.554 | |
| oop_27 | | 0.468 | |
| oop_38 | | 0.501 | |
| oop_43 | | 0.755 | |
| oop_45 | | 0.631 | |
| sop_1 | | | 0.789 |
| sop_6 | | | 0.909 |
| sop_8 | | | 0.694 |
| sop_12 | | | 0.772 |
| sop_14 | | | 0.861 |
| sop_15 | | | 0.951 |
| sop_17 | | | 0.841 |
| sop_20 | | | 0.921 |
| sop_23 | | | 0.661 |
| spp_25 | | | 0.417 |
| oop_26 | | 0.407 | **0.443** |
| sop_28 | | | 0.918 |
| sop_32 | | | 0.758 |
| sop_34 | | | 0.450 |
| sop_40 | | | 0.725 |
| sop_42 | | | 0.705 |

*Note*. SPP, Socially Prescribed Perfectionism; OOP, Other-Oriented Perfectionism; SOP, Self-Oriented Perfectionism.

### *Evidence of validity based on the relationship with other variables (convergent validity)*

Regarding evidence of validity based on the relationship with other variables, Spearman correlations (rho) were calculated to verify associations between scores in the perfectionism scale dimensions (SPP, OOP and SOP), scores in the *Big Five Inventory* (Conscientiousness, Agreeableness, and Neuroticism), and scores in the AAQ-II scale (inflexibility). Results are depicted in Table 2.

As can be seen in Table 2, most correlations were low, and three of the associations were moderate or strong: between Neuroticism and Inflexibility (rho = .63; $p < .001$), SPP and SOP (rho = .54; $p < .001$), and OOP and SOP (rho = .41; $p < .001$).

Table 2
*Spearman Correlations (rho) Between Scores on the Perfectionism Scale Dimensions (SPP, OOP, and SOP), the Big Five Inventory (Conscientiousness, Openness, and Neuroticism), and the AAQ-II Scale (Inflexibility)*

| Dimension | | | Spearman rho | *p* | 95% CI | |
|---|---|---|---|---|---|---|
| | | | | | Lower | Upper |
| Conscientiousness | - | SPP | 0.0071 | 0.8917 | -0.0952 | 0.1093 |
| Conscientiousness | - | OOP | 0.2811 | ***< 0.001 | 0.1842 | 0.3727 |
| Conscientiousness | - | SOP | 0.3384 | ***< 0.001 | 0.2446 | 0.4259 |
| Openness | - | SPP | -0.1888 | ***0.0003 | -0.2855 | -0.0883 |
| Openness | - | OOP | -0.1870 | ***0.0003 | -0.2838 | -0.0864 |
| Openness | - | SOP | -0.1454 | **0.0052 | -0.2440 | -0.0438 |
| Neuroticism | - | SPP | 0.3655 | ***< 0.001 | 0.2735 | 0.4509 |
| Neuroticism | - | OOP | 0.0918 | 0.0787 | -0.0105 | 0.1922 |
| Neuroticism | - | SOP | 0.3771 | ***< 0.001 | 0.2859 | 0.4616 |
| SPP | - | OOP | 0.2721 | ***< 0.001 | 0.1747 | 0.3642 |
| SPP | - | SOP | **0.5485** | ***< 0.001 | 0.4727 | 0.6161 |
| SPP | - | Inflexibility | 0.5010 | ***< 0.001 | 0.4203 | 0.5739 |
| OOP | - | SOP | **0.4152** | ***< 0.001 | 0.3269 | 0.4964 |
| OOP | - | Inflexibility | 0.0679 | 0.1938 | -0.0346 | 0.1689 |
| SOP | - | Inflexibility | 0.3769 | ***< 0.001 | 0.2857 | 0.4614 |

*Note*. SPP, Socially Prescribed Perfectionism; OOP, Other-Oriented Perfectionism; SOP, Self-Oriented Perfectionism; * $p < .05$, ** $p < .01$, *** $p < .001$.

## DISCUSSION

The present study aimed to present validity evidence (internal structure and convergence with external measurements of personality and psychological flexibility) and reliability evidence of the Hewitt and Flett Multidimensional Perfectionism Scale (H&F-MPS) for Brazilian adults. To this end, exploratory factor analysis was performed, and fit indexes of the models, analysis of discrimination of the items, reliability of the obtained factors, and correlations with other instruments were all presented. Results in this study expand the psychometric findings of H&F-MPS beyond those obtained in the original study in which the scale was first built (Hewitt & Flett, 1991; Hewitt et al., 1991), and it also contributes to the understanding of the H&F-MPS in the Brazilian context.

Regarding the internal structure, exploratory factor analysis pointed to an adequate adjustment of the three-factor solution proposed by Hewitt and Flett (1991), in which the vast majority of the items presented high factor loadings (> .40) over their original factors. Only two items (26 and 39) had cross-loadings, and using Pratt's Importance Measures, the largest proportion of the variation of item 39 was linked to the factor to which it had been originally allocated on a theoretical basis, in contrast to that found for item 26. Notwithstanding, these few changes in relation to the original structure of the instrument (proposed by Hewitt & Flett, 1991; Hewitt et al., 1991), the present findings accorded with results from other studies that investigated the psychometric properties of the H&F-MPS in other countries and languages, such as Portugal, Spain, and the Netherlands (Campayo et al., 2009; De Cuyper et al., 2015; Soares et al., 2003). Their authors have not only reached a three-factor solution to the instrument, but also have pointed to satisfactory reliability levels (> .70) for each of the three dimensions of the scale. Interestingly, analyses run on the present version (Brazilian Portuguese) have indicated that three items (29, 36 and 37) did not load adequately on any of the three factors of the

scale. A very similar result has been found in the study of the Portuguese version (European Portuguese) of the scale. In the study conducted by Soares et al. (2003), the items 29, 37, 38 and 45 were only weakly associated (factor loadings under .20) with at least one of the three factors of the scale, and two of them (29 and 37) were the same items that did not present significant factor loadings in the present study with a Brazilian sample. On remaining H&F-MPS versions in other languages, such results have not been found (Campayo et al., 2009; De Cuyper et al., 2015; Hewitt & Flett, 1991).

This internal structure data generated by both the Brazilian and the Portuguese samples suggests that it is possible that part of the explanation of why these items have presented low factor loadings could be associated with the interpretation of their content in the Portuguese language (that is semantically and grammatically different from English and French, for example), or to issues in the translation of the instrument, leading to an item construction that is not able to capture the conceptual meaning of the construct. In this case, versions of the items with alternative translations, using fewer complex structures in the Portuguese language (without negatives, for example), could be tested in future studies of the instrument. In addition, it would be interesting to verify the occurrence of similar findings in other Portuguese speaking countries, such as some African countries, in order to test the hypothesis that different semantic and grammatical constructions of Portuguese impact on the comprehension of the item's meaning.

Regarding item parameters, results showed that virtually all H&F-MPS items that were retained in the final three-factor solution are moderately to highly discriminative, indicating they would be recommended to differentiate individuals with different levels of perfectionism. Additionally, the analyses of the item parameters indicated that the item response patterns are within the expected range, which means that the greater the level of the latent trait, the greater the tendency of people to endorse the higher response category of the instrument. These findings complement H&F-MPS psychometric information currently available in the literature since other studies with the scale presenting discriminative item analysis are unknown. Notwithstanding the originality of the analysis procedures of the present work, it was not possible to compare the present findings on the item parameters with other studies on the same matter.

Proceeding with the discussion, convergent validity of the perfectionism scale was verified by correlations of its three factors (Self-Oriented Perfectionism, Socially Prescribed Perfectionism and Other-Oriented Perfectionism) with three personality traits (Neuroticism, Conscientiousness and Openness to Experience), and with psychological inflexibility. As expected, and in accordance with other studies that used H&F-MPS and other perfectionism scales (De Cuyper et al., 2015; Smith et al., 2019; Stricker et al., 2019), Conscientiousness was significantly and positively associated with more intrapersonal dimensions of the Hewitt and Flett (1991) model, namely Self-Oriented Perfectionism (more strongly) and, occasionally, with the Other-Oriented Perfectionism. Consistently, Conscientiousness seems to be related to the establishment of high-performance standards (or excellence), present in what is known as perfectionistic strivings (Smith et al., 2021). Perfectionistic strivings, in the Hewitt and Flett multidimensional perfectionism scale (1991), are better represented by the SOP dimension. This conceptual confluence between Conscientiousness and the perfectionistic strivings is not surprising at all considering that one of the facets of the Conscientiousness trait is the *achievement striving* (i.e., *striving for excellence*), the latter being a fundamental characteristic of perfectionist standards (Smith et al., 2021; Stoeber, 2018).

In a similar way, the positive and significant associations between Neuroticism and the SOP and SPP dimensions were also expected (Stricker et al., 2019). High levels of Self-Oriented Perfectionism involve excessive worrying about failure, severe and persistent self-criticism, and low tolerance to mistakes, whereas high levels of Socially Prescribed Perfectionism are tied to an excessive worry over other people's evaluations and judgements and over pressure and demands from third parties, low tolerance to critic, and high levels of performance anxiety (Hewitt et al., 1991; Stricker et al., 2019). In this sense, perfectionistic concerns are clearly aligned to the image of highly neurotic individuals, that is, emotionally unstable, insecure, susceptible to stress and to negative emotions. Regarding the associations found between Openness and perfectionism dimensions, all of them were very low and negative, indicating a tendency towards less originality, creativity, and plasticity in people with high levels of perfectionism. Even though this finding has not always been reported in other studies, not even in the Stricker et al. (2019) meta-analysis, a recent study conducted by Goulet-Pelletier et al. (2021) has demonstrated that high levels of perfectionism are associated with lower levels of Openness to Experience. According to the authors, very high levels of preoccupations and perfectionist performance standards "dilacerate creativity", given the latter comes precisely from divergent thinking, from greater fluidity amidst ideas, and from little need for rigid and methodical performance. It makes sense, therefore, to think that very rigid individuals, who need control and method to achieve realization and to fulfill elevated levels of performance, such as perfectionists, tend toward lower Openness.

The findings of the present study on the relation between psychological inflexibility and perfectionism dimensions Self-Oriented and Socially Prescribed Perfectionism are along the same lines. Results showed that high levels of psychological inflexibility (inability to change the behavior in response to contingencies, followed by perseverance despite personal consequences) are associated with high levels of perfectionism, with low to moderate correlations. These results corroborate what has been noted by some researchers in the field, that very high levels of perfectionism,

sometimes known as rigid perfectionism, are marked by excessive control, rigidity, and behavioral, cognitive, and affective inflexibility, possibly leading to several functional impairments to these individuals (APA, 2013, Stoeber, 2014b; Tanham, 2019). Inflexibility and rigidity over emotions and behaviors are characteristics observed in some disorders, such as obsessive-compulsive personality disorder and eating disorders, in which perfectionism seems to be a main characteristic (APA, 2013, Stoeber, 2014b).

The present study has some limitations. A non-probabilistic convenience sample was used, which restricts and limits the generalization of the findings. Furthermore, self-report instruments were employed, and they are dependent, therefore, on people's perception of their own functioning, and are susceptible to biases related to response style, such as social desirability. This kind of bias may act by masking individuals' real psychological functioning, leading to an erroneous interpretation of the research findings. Future studies using perfectionism scales should strive to control the effect of phenomena like social desirability and acquiescence. Greater diversification of the sample in terms of age, educational level, and gender would also be advisable so that it would make it possible to better investigate the item and construct patterns related to the instrument's metric, scalar, and configural invariance.

Notwithstanding the aforementioned limitations, the present findings have implications for both research and professional practice. First, perfectionism has been consistently associated with mental health outcomes, such as eating disorders, depression, anxiety disorders, personality disorders, suicide ideation, burnout, social isolation, and disconnection, among others (Flett & Hewitt, 2016; Kothari et al., 2019; Robinson et al., 2021; Sametoğlu et al., 2021; Tyler et al., 2020). Therefore, expanding research on this construct can benefit society as a whole and practitioners working in clinical settings. Instruments with good psychometric properties can assist not only in the assessment of perfectionism levels and of its particular manifestations, but also in the elaboration of more accurate interventions. Second, construction and adaptation of instruments with adequate psychometric properties to measure perfectionism is crucial to the progress of the understanding of the construct in its different components, and cognitive, emotional and behavioral manifestations. Lastly, the availability of scales with good psychometric properties can favor the expansion of studies on perfectionism in Brazil, cementing its importance to clinical practice, and propagate it to other fields and contexts, such as the educational and occupational ones, to which perfectionism might have wide, but still unexplored, consequences. It should also be stressed that H&F-MPS is one of the most largely used scales in the investigation of perfectionism around the world. Thus, the existence of a Brazilian Portuguese version with good validity and reliability indicators might favor the conduction of transcultural studies, with subsequent expansion of the understanding of social and cultural determinants of perfectionism.

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