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## Development and Validation of the Frost Multidimensional Perfectionism Scale–Brief

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# Development and Validation of the Frost Multidimensional Perfectionism Scale–Brief

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## Abstract

Twenty-five years ago, one of the first empirically validated measures of perfectionism, the Frost et al. Multidimensional Perfectionism Scale (F-MPS) was published. Since that time, psychometric studies of the original F-MPS have provided a plethora of evidence to support the potential development of a shorter yet still psychometrically robust version of the measure. Using confirmatory factor analyses across community and clinical samples, the current study identifies an eight-item F-MPS-Brief with two dimensions (i.e., striving and evaluative concerns) that evidences good internal consistency, measurement equivalence across ethnicities, and concurrent and convergent validity. This new, short version of the F-MPS captures well the bidimensional model of perfectionism that has emerged across studies over the past two decades and is suggested for use when a short yet high-performing assessment tool for this model is desired.

## Keywords

perfectionism, Frost Multidimensional Perfectionism Scale, measurement, standards, depression, stress, worry

## Introduction

Over the course of the past 25 years, a considerable body of literature has examined the role of perfectionism in a variety of areas of functioning. Although the definitions and measures have varied somewhat, certain dimensions of perfectionism have been implicated in anxiety disorders, depression, eating disorders, suicide risk, health and chronic illnesses, workplace dysfunction, academic achievement, and athletic performance (Egan, Wade, & Shafran, 2011; Hewitt & Flett, 2002). Perfectionism is so ubiquitous in psychological disorders that it may function as a transdiagnostic process crucial to our understanding of general well-being (Antony, Purdon, Huta, & Swinson, 1998; Sassaroli et al., 2008).

Frost, Marten, Lahart, and Rosenblate (1990) developed the Frost Multidimensional Perfectionism Scale (F-MPS), which included five perfectionistic dimensions and one related dimension designed to assess the setting of excessively high standards for performance

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accompanied by overly critical self-evaluation. Of these original dimensions, two involved the nature of self-evaluation: Concern Over Mistakes (CM), which reflects negative reactions to mistakes, the interpretation of mistakes as equivalent to failure, and the belief that one will lose the respect of others after failure, and Doubts About Actions (DA), which involves the tendency to doubt the quality of one's actions and competence. A third subscale, Personal Standards (PS), was thought to reflect the setting of excessively high standards for performance. This dimension has been emphasized by most theorists on perfectionism, but has shown the smallest and least consistent association with psychopathology (DiBartolo, Li, & Frost, 2008; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Lundh, 2004; Stoeber & Otto, 2006). Two other dimensions focused on interpersonal family relationships affecting both standard setting and critical evaluation. Parental Expectations (PE) reflects the perception that parents set extremely high standards, while Parental Criticism (PC) involves the belief that parents are overly critical of one's attempts to meet them. A tendency to be orderly and organized constituted the sixth factor, Organization (O), but has been found to be sufficiently distinct that it is not typically included as an integral part of the perfectionism construct (Frost et al., 1990).

Considerable research has supported a bidimensional structure of perfectionism both for the F-MPS and other measures of perfectionism (Bieling, Israeli, & Antony, 2004; Dunkley, Blankstein, Masheb, & Grilo, 2006; Pearson & Gleaves, 2006; Stumpf & Parker, 2000; Terry-Short, Glynn Owens, Slade, & Dewey, 1995). The first of these dimensions encompasses high goal setting and striving for achievement; this aspect will be called "Striving (S)" in the current article. This dimension is most often represented by the PS subscale alone, but occasionally, PE items are included as well (Harvey, Pallant, & Harvey, 2004; Stumpf & Parker, 2000). The second dimension, which will be called "Evaluative Concerns (EC)," includes self-criticism for not reaching one's goals and worry about negative performance evaluation. This aspect of perfectionism is always represented by CM and DA, although occasionally the PC and PE subscales also factor into this dimension (Frost et al., 1993). Although much of the research on perfectionism has focused on the independent contribution of these dimensions of perfectionism, a number of investigators have suggested that high S will be pathological depending on the simultaneous presence of EC (Alden, Ryder, & Mellings, 2002; Gaudreau, 2015; Lundh, 2004; Lundh, Saboonchi, & Wångby, 2008; Stoeber & Otto, 2006).

A tremendous amount of data gathered on the F-MPS in the past 25 years provides further insight into the measure's structure and functioning. Although the F-MPS is nearly always found to contain dimensions representative of EC and S, several investigations have found that the parental subscales (PE and PC) factor separately to form a third dimension (Hawkins, Watt, & Sinclair, 2006; Khawaja & Armstrong, 2005; Purdon, Antony, & Swinson, 1999; Stumpf & Parker, 2000). This finding suggests that the F-MPS may have a three-factor structure that includes the most central EC and S components along with a separate parental factor. These results help to explain the inconsistency of the factor placement of the PE and PC subscales in relation to CM, DA, and PS. Furthermore, these findings indicate that the parental scales of the F-MPS may be more reflective of the development of perfectionism rather than the nature of the construct, which has led investigators to focus more on the other EC subscales.

The wealth of empirical information about the F-MPS allows for the creation of a honed, brief version of the scale. During the development of the F-MPS, items were clustered into subscales primarily according to an exploratory factor analysis (EFA). However, some items were shifted into subscales to maintain conceptual continuity within each subscale (Frost et al., 1990). Consequently, later psychometric explorations of the F-MPS have found some items with consistently poor primary loadings ( $\lambda < .400$ ) and high cross-loadings ( $\lambda > .300$ ). Interestingly, investigations over the past three decades with very diverse populations (e.g., clinical, community, adults, adolescents, international) have frequently identified the same items as underperforming. For example, one PS item ("If I do not set the highest standards for myself, I am likely to end up

**Table 1.** Demographic Information for Each Data Set.

	<i>n</i>	% Female	Age: <i>M</i> ( <i>SD</i> )
Community sample	1,024	99.2	20.98 (5.44)
Data Set 1	198	100	21.35 (5.12)
Data Set 2	243	100	NA
Data Set 3	227	97.9	21.81 (6.93)
Data Set 4	213	100	19.27 (1.45)
Clinical sample	90	82.2	51.28 (13.21)
Data Set 5	38	71.7	44.08 (13.30)
Data Set 6	52	90.4	56.54 (10.47)
Measurement equivalence sample	405	86.7	22.01 (5.91)

Note. NA = Information not available for this data set.

a second rate person”) is repeatedly found to load strongly onto EC subscales, rather than factoring with other PS items (DiBartolo, Frost, Chang, LaSota, & Grills, 2004; Khawaja & Armstrong, 2005; Parker & Stumpf, 1995; Purdon et al., 1999; Stallman & Hurst, 2011). This suggests that this PS item is actually assessing self-criticism related to falling short of standards rather than striving for high performance goals in and of themselves. In sum, this wealth of data provides the opportunity to reduce cross-subscale contamination and produce an efficient F-MPS form.

The current article represents an attempt to develop a brief version of the F-MPS to streamline measurement of the two most central constructs (S and EC). The goal was to create and evaluate a shortened F-MPS with good internal consistency as well as concurrent and convergent validity consistent with literature from the previous 25 years of perfectionism research. The psychometric properties of the F-MPS-Brief were anticipated to be strong given the robustness of the original measure.

## Method

### *Participants and Procedure*

The present analyses utilized seven data sets collected within the context of independent projects and recruitment efforts (see Table 1). Four of these data sets were collected at a women’s liberal arts college (combined to form the “community sample,”  $n = 881$ ). Two samples include adults with clinical diagnoses of obsessive-compulsive disorder (OCD) and/or hoarding disorder (HD; combined to form the “clinical sample,”  $n = 90$ ). Finally, one sample is composed of undergraduates from two large public universities (e.g., “measurement equivalence sample,”  $n = 405$ ). Parts of this data set were used for an investigation of cross-cultural perfectionism measurement (Burgess, DiBartolo, & Rendón, 2016). Participants in the community sample ( $n = 881$ ) ranged in age from 16 to 57 years, with a mean of 20.79 years ( $SD = 5.13$  years). Participants selected the following gender categories: 1% male/other and 99% female. The clinical sample ( $n = 90$ ) included participants with an age range of 18 to 86 years ( $M = 51.28$ ,  $SD = 13.21$ ). In the clinical sample, participants reported being 17.8% male and 82.2% female. A large majority of the community and clinical samples were Caucasian, but specific racial and/or ethnic information is unavailable. Within the measurement equivalence sample, participants had an average age of 22.01 years ( $SD = 5.91$ ), were 86.7% female, and reported the following ethnicities: 61.7% “White, European American, or European” ( $n = 250$ ) and 38.3% “Black, African, or African American” ( $n = 155$ ). All participants were consented before completing questionnaires.

## Measures

### Perfectionism

**Almost Perfect Scale–Revised (APS-R).** The APS-R (Slaney, Rice, Mobley, Trippi, & Ashby, 2001) is a 23-item instrument designed to assess intrapersonal perfectionism using three subscales: High Standards (e.g., “I set very high standards for myself”), Discrepancy (e.g., “I rarely live up to my high standards”), and Order (not used in the current study). Respondents use a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Slaney and colleagues (2001) found support for the three-factor structure of the APS-R, along with high internal consistency for the three subscales. Furthermore, convergent validity was demonstrated with the 35-item F-MPS.

**Frost Multidimensional Perfectionism Scale (F-MPS).** The full F-MPS (Frost et al., 1990) is a 35-item scale containing six subscales: DA (four items; for example, “I usually have doubts about the simple everyday things I do”), CM (nine items; for example, “I should be upset if I make a mistake”), PE (five items; for example, “My parents wanted me to be the best at everything”), PC (four items; for example, “My parents never tried to understand my mistakes”), PS (seven items; for example, “I expect higher performance in my daily tasks than most people”), and O (six items; for example, “I am an organized person”). Each item is answered using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Good internal consistency and convergent validity with other measures of perfectionism have been demonstrated for the F-MPS within community and clinical samples of adults (Frost et al., 1990; Purdon et al., 1999). The factor structure of the F-MPS has been somewhat variable across samples, as described above.

### Associated constructs

**Brief Fear of Negative Evaluation Scale (BFNE).** The BFNE is a 12 item scale assessing the expectation of, avoidance of, and apprehension surrounding negative evaluation (Leary, 1983). The BFNE correlates strongly with the original 30-item version of the measure ( $r = .96$ ) and has demonstrated an adequate four week test-retest reliability coefficient of .75 (Leary, 1983). The BFNE employs a Likert-type scale ranging from 1 (*not at all characteristic of me*) to 5 (*extremely characteristic of me*). The BFNE has demonstrated good internal consistency ( $\alpha = .81-.90$ ), convergent validity with social anxiety and worry measures, and sensitivity to cognitive-behavioral therapy effects for social anxiety patients (Weeks et al., 2005).

**Brief Penn-State Worry Questionnaire (B-PSWQ).** The full 16-item PSWQ (Topper, Emmelkamp, Watkins, & Ehring, 2014) was developed to assess clinically significant worry and has been shown to have high internal consistency, good test–retest reliability, and good convergent and discriminant validity for both clinical and community samples (Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ and B-PSWQ use a 5-point Likert-type scale ranging from 1 (*not at all typical of me*) to 5 (*very typical of me*). The five-item shortened version of the measure has good internal consistency ( $\alpha = .85-.91$ ), and a high correlation with the full PSWQ ( $r_s = .92-.94$ ) for community samples of young adults (Topper et al., 2014). Furthermore, in the same sample, the B-PSWQ was able to predict future anxiety scores on the State-Trait Anxiety Inventory.

**Depression, Anxiety, and Stress Scale–21 (DASS-21).** The DASS-21 (Lovibond, & Lovibond, 1995) is a self-report questionnaire with three seven-item subscales: Depression, Anxiety, and Stress. The DASS-21 has a 4-point Likert-type response scale ranging from 0 (*never*) to 3 (*almost always*). There is evidence for high internal consistency for the subscales, and good fit for the three-factor structure of the measure (Antony, Bieling, Cox, Enns, & Swinson, 1998). In a clinical sample, Gloster and colleagues (2008) found the DASS-21 to have excellent convergent

validity with the Beck Depression Inventory–II, Beck Anxiety Inventory, and PSWQ. Furthermore, these authors noted good discriminative validity for mood disorder patients, who scored significantly higher than patients with an anxiety disorder on the DASS Depression subscale.

*Eating Disorders Inventory–Body Dissatisfaction (EDI-BD)*. The EDI is a 64-item instrument assessing a variety of beliefs and behaviors related to eating disorders. The EDI-BD (Garner, Olmstead, & Polivy, 1983) is a nine-item subscale of this measure that queries respondents about their body dissatisfaction with regard to specific areas of the body, such as the waist and thighs. The response format is a 6-point Likert-type scale rating from 1 (*always*) to 6 (*never*). Internal consistency for this subscale is high across diverse samples (Gordon, Castro, Sitnikov, & Holm-Denoma, 2010).

*Obsessive-Compulsive Inventory–Revised (OCI-R)*. The OCI-R (Foa et al., 2002) is an 18-item scale that assesses the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV*; American Psychiatric Association, 1994) criteria of OCD. The OCI-R contains six subscales: Checking, Obsessing, Hoarding, Washing, Ordering, and Neutralizing, the first three of which were utilized in the present study. On the OCI-R, respondents rate their symptoms over the past month on a 5-point Likert-type response scale ranging from 0 (*not at all*) to 4 (*extremely*). Foa and colleagues (2002) demonstrated high internal consistency and good convergent validity for the OCI-R among community samples and adults diagnosed with an anxiety disorder. Furthermore, the OCI-R was able to differentiate well between adults with and without clinical diagnoses of OCD (Foa et al., 2002).

*Saving Cognitions Inventory (SCI)*. The SCI (Steketee, Frost, & Kyrios, 2003) was designed to measure the attitudes and beliefs associated with hoarding behavior. This 24-item self-report measure is rated on a 7-point Likert-type scale ranging from 1 (*not at all*) to 7 (*very much*). The SCI contains four subscales: Emotional Attachment to Possessions, Control Over Possessions, Responsibility for Possessions, and Concerns About Memory. The four-factor structure of the SCI has been supported, and the subscales have demonstrated good internal consistency (Steketee et al., 2003). In addition, SCI scores have convergent validity with measures of hoarding and are able to predict hoarding severity, obsessive-compulsive symptoms, and mood state.

*Savings Inventory–Revised (SI-R)*. The SI-R (Frost, Steketee, & Grisham, 2004) includes 23 items that assess symptoms of Hoarding Disorder with three subscales: Clutter, Acquisition, and Discarding. The SI-R is rated on a 7-point Likert-type response scale ranging from 1 (*not at all*) to 7 (*very much*). Frost and colleagues (2004) demonstrated good fit for the three-factor structure of the measure, along with good internal consistency and test–retest reliability within a clinical sample. Good convergent validity was supported using the OCI-R Hoarding subscale, whereas the divergent validity of the SI-R was demonstrated using measures of positive affect and depression (Fontenelle et al., 2010; Frost et al., 2004).

## Statistical Analyses

*Data preparation*. Within each data set, participants were removed for whom more than 10% of their data were missing. Of the community, clinical, and measurement equivalence samples, 10.6%, 24.4%, and 0.9% of the participants, respectively, were removed for excessive missing data. Participants who were retained in the sample had no more than two items missing from their F-MPS data (i.e., for participants who completed the survey [ $<10\%$  missing data], there were very little data missing). Data were then multiply imputed for descriptive and correlational analysis using SPSS 23. Pooled results from the five imputations of each data set are reported where

indicated. To perform analyses in AMOS 23, single imputation was performed on the combined clinical and community data sets. These data were used for the confirmatory factor analyses and measurement equivalence analyses.

*Item selection.* The first aim of the current project was to choose the best performing items from the F-MPS to form high-functioning subscales assessing the bidimensional model of perfectionism. Thus, the O items were not included given that this subscale is considered only peripherally related to the construct of perfectionism (Frost et al., 1990); previous literature typically indicates no correlation between O and the F-MPS total score, other perfectionism measures, or important associated features of the perfectionism construct (Frost et al., 1990). To determine which of the remaining items would be retained, 18 psychometric investigations of the F-MPS were reviewed for commonly identified problematic items (primary loading  $\lambda < .400$  and/or cross-loading  $\lambda > .300$ ). Subsequently, the following steps were taken: (a) Items identified by three or fewer studies as being problematic were retained (six CM items, one DA item, one PE item, and four PS items), (b) subscales with only one item remaining (DA/PE) were eliminated due to the need for multiple items to assess each construct, (c) a representative selection of the remaining EC items were chosen (the four remaining CM items) such that the EC and S subscales both contained four items with minimal item content overlap. This eight-item scale assessing the bidimensional model was then analyzed with regard to its factor structure, measurement equivalence across ethnic groups, internal consistency, and relationship with other measures relevant to perfectionism.

*Factor structure and measurement equivalence.* To evaluate the factor structure of the eight-item F-MPS-Brief, CFAs were conducted with maximum likelihood estimation. The comparative fit index (CFI; Bentler, 1990) and the root mean square error of approximation (RMSEA; Steiger, 1990) were used as indicators of model fit, with CFI values above .90 and .95 and RMSEA values below .10 and .05 indicating good and excellent fit, respectively (Kline, 2005). The combined clinical and community samples were each separately evaluated for model fit at this stage.

Next, the cross-cultural equivalence of the model was investigated (Byrne, 2010) between individuals of European descent (ED) and African descent (AD; these terms were adopted because citizenship/immigration status varied among participants, thus terms such as *African American* did not apply to all participants within the African descent group). The measurement equivalence sample was utilized for these analyses. Increasingly restrictive multi-group confirmatory factor analyses (MG-CFAs) were conducted in which the following subsets of parameters were sequentially constrained to be equal: (a) measurement weights (i.e., factor loadings or paths from latent variables to their respective item indicators), (b) structural co/variances (i.e., variances and covariances of the latent variables), (c) the residual covariances, and (d) measurement intercepts (points of origin/intercepts in the equations for predicting measured variables). As each new set of parameters was constrained, previously imposed constraints were maintained (Arbuckle, 2013). Significant changes in the chi-square fit statistic indicated nonequivalence across groups (Byrne, 2010).

Three levels of measurement equivalence were assessed. Evidence for configural equivalence was provided if the F-MPS-Brief model fit well for the ED and AD groups individually (e.g., model had the same number of factors, and each item loaded onto the same factor for each group). Equivalence at the level of measurement weights was considered evidence for metric invariance, which suggests that items have invariant measurement units. When metric invariance is achieved, predictive relationships may be compared across groups because a single unit of change in one group is equivalent to a single unit of change in the other group. Equivalence across measurement intercepts was indicative of scalar equivalence, which indicates that scores

**Table 2.** Model Fit Indices for Single- and Multi-Group Analyses.

	$\chi^2$	df	CFI	Difference from unconstrained model			
				RMSEA	$\chi^2_{diff}$	df	p
<b>Factor structure</b>							
Community sample	146.19**	19	.954	.087	—	—	—
Clinical sample	32.29*	19	.959	.089	—	—	—
<b>Measurement equivalence</b>							
Unconstrained measurement model	62.10*	38	.978	.040	—	—	—
Measurement weights	67.49*	44	.979	.036	5.40	6	.494
Structural co/variances	68.27*	47	.981	.034	6.18	9	.722
Measurement residuals	75.10*	55	.981	.031	13.88	17	.676
Measurement intercepts	98.15*	63	.968	.037	36.06	25	.071

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation.

\* $p < .05$ . \*\* $p < .001$ .

across groups have the same point of origin. When scalar equivalence is found, raw scores are directly comparable between groups (Chen, 2008).

### Reliability and Validity

Internal consistency of the F-MPS-Brief subscales was evaluated with the pooled Cronbach's alpha coefficient for the combined community and clinical samples. Construct validity was evaluated using pooled Pearson correlations between the F-MPS-Brief and measures of perfectionism, anxiety, worry, depression, and hoarding. Significant correlations between these measures and the F-MPS-Brief EC subscale were considered evidence of convergent validity. The S subscale was expected to correlate non-significantly or at least less strongly with each of these measures. Individual data sets were used for the correlational analyses, as not all data sets contained all measures used for comparison.

## Results

### Factor Structure and Measurement Equivalence

The two-factor structure of the F-MPS-Brief demonstrated good to excellent fit for both the community and clinical samples (Table 2). Across the clinical and community samples, standardized regression weights for all items were strong and in the expected direction ( $p < .001$ ; Table 3). To examine measurement invariance across groups, the model fit was first evaluated within each of the ethnic groups represented in the measurement equivalence sample. Fit statistics were excellent for the model within the ED ( $\chi^2 = 27.41$ ,  $p = .095$ ; CFI = .988, RMSEA = .042) and AD groups ( $\chi^2 = 34.66$ ,  $p = .015$ , CFI = .961, RMSEA = .073) separately, which is suggestive of configural equivalence. The MG-CFAs indicated invariance between ED and AD groups for item-factor loadings and factor co/variances parameters, which suggests cross-ethnic metric invariance (Table 2). Measurement intercepts were also found to be equivalent. This finding is supportive of scalar equivalence, which means that raw F-MPS-Brief scores may be compared across ED and AD groups.



**Table 3.** Regression Weights and Normative Data for F-MPS-Brief Items and Subscales.

	Community			Clinical		
	$\beta$	<i>M</i>	<i>SD</i>	$\beta$	<i>M</i>	<i>SD</i>
Evaluative concerns		9.99	4.02		11.86	4.10
Item 9: If I fail at work/school, I am a failure as a person	.625	2.79	1.33	.569	3.10	1.26
Item 13: If someone does a task at work/school better than me, then I feel like I failed at the whole task	.727	2.27	1.15	.803	2.72	1.15
Item 25: If I do not do well all the time, people will not respect me	.846	2.48	1.23	.888	3.04	1.19
Item 34: The fewer mistakes I make, the more people will like me	.772	2.45	1.23	.831	2.99	1.32
Striving		13.04	3.91		14.40	3.79
Item 12: I set higher goals for myself than most people	.636	3.59	1.16	.802	3.76	1.13
Item 19: I have extremely high goals	.704	3.48	1.24	.703	3.52	1.18
Item 24: Other people seem to accept lower standards from themselves than I do	.715	2.99	1.23	.744	3.48	1.19
Item 30: I expect higher performance in my daily tasks than most people	.804	2.99	1.27	.740	3.63	1.12

### Reliability and Validity

Descriptive statistics, based on pooled estimates, are presented in Table 3 for the community and clinical samples separately. Consistent with expectation, all item and subscale means were higher for the clinical sample, with the two subscale scores being statistically significantly higher ( $p < .001$ ). Among the clinical and community samples, the internal consistency of the EC ( $\alpha = .85$  and  $.83$ , respectively) and S ( $\alpha = .85$  and  $.81$ , respectively) factors was high. Furthermore, the two subscales demonstrated pooled correlation estimates with one another with the expected strength and direction in both the clinical ( $r = .39, p < .01$ ) and community ( $r = .47, p < .01$ ) samples.

The EC and S subscales were evaluated in relation to measures of depression, general anxiety, worry, fear of negative evaluation, checking and obsessing symptoms, perfectionism, and hoarding behaviors and beliefs (see Tables 4 and 5 for pooled correlation coefficients). The EC subscale correlated strongly with the APS Discrepancy subscale, and the S correlated strongly with APS Standards, which is supportive of good construct validity for the new subscales. Of note, the original full length F-MPS CM subscale correlated with APS Discrepancy ( $r = .719, p < .001$ ), and the F-MPS PS subscales correlated with APS Standards ( $r = .699, p < .001$ ) with approximately the same strength as the F-MPS-Brief subscales when using data from Data Set 3. The F-MPS-Brief EC subscale consistently and significantly correlated with measures of depression, general anxiety, worry, fear of negative evaluation, checking and obsessing symptoms, and hoarding among community samples, suggesting good convergent validity. Within the combined clinical sample, the EC subscale was significantly correlated with all hoarding beliefs and behaviors, with the exception of SI-R-Clutter.

Regarding S, there were mixed results as to the relationship of this dimension of perfectionism with DASS Depression and Anxiety in community samples (see Table 4). S was significantly related to worry and OCD symptomatology in the one available community sample; however, additional data sets might suggest a similarly mixed pattern of findings for these two variables. In most cases, the relationship of EC with psychopathology was significantly higher ( $p < .05$ )

**Table 4.** Correlations of New F-MPS2 Factors With Measures of Anxiety, Depression, and Eating Pathology.

	Evaluative concerns	Striving
Depression (DASS)		
Data Set 1 <sup>a</sup>	.409**	.159*
Data Set 3 <sup>a</sup>	.459**	-.008
Data Set 4 <sup>a</sup>	.478**	.243**
Data Set 6 <sup>a</sup>	.442**	.089
Anxiety		
DASS anxiety		
Data Set 1 <sup>a</sup>	.390**	.198**
Data Set 3 <sup>a</sup>	.489**	.035
Data Set 4 <sup>a</sup>	.497**	.193**
Data Set 6 <sup>a</sup>	.344*	-.042
PSWQ total		
Data Set 1	.386**	.284**
BFNE total		
Data Set 3 <sup>a</sup>	.477**	.083
Data Set 4 <sup>a</sup>	.333**	.054
OCI-R checking		
Data Set 2 <sup>a</sup>	.331**	.186**
OCI-R obsessing		
Data Set 2 <sup>a</sup>	.555**	.176**

Note. F-MPS2 = Frost Multidimensional Perfectionism Scale-2; DASS = Depression, Anxiety, and Stress Scale; PSWQ = Penn-State Worry Questionnaire; BFNE = Brief Fear of Negative Evaluation; OCI-R = Obsessive-Compulsive Inventory-Revised. <sup>a</sup>Indicates that for this data set, the correlation of S is significantly ( $p < .05$ ) lower than that of EC with the specific area of psychopathology. All correlations are pooled across five multiple imputation data sets.

\* $p < .05$ . \*\* $p < .001$  for correlation coefficients.

than the relationship of S with psychopathology (see Tables 4 and 5). Previous studies have sometimes found positive correlations between S and OCD (Wu & Cortesi, 2009) as well as worry (Handley, Egan, Kane, & Rees, 2014). In both community and clinical samples, S was unrelated to indices of hoarding. These results accurately reflect the mixed findings related to S and psychopathology in the literature.

## Discussion

In response to 25 years of research on the construct and measurement of perfectionism, the F-MPS-Brief was created to represent the two core constructs of EC and S. Item reduction strategies included the synthesis of results from 18 prior psychometric investigations of the F-MPS, along with a review to select a representative set of items. Within both community and clinical samples, the eight-item scale was evaluated for its factor structure, cultural measurement equivalence, internal consistency, and convergent and divergent validity in relation to measures of perfectionism and psychopathology. Results suggest that the F-MPS-Brief is a substantially leaner yet high-performing assessment tool for intrapersonal perfectionism.

The hypothesized bidimensional structure of the F-MPS-Brief fit well across a diversity of samples (e.g., a clinically diagnosed sample of adults, a sample representative of undergraduates at small, private northeast liberal arts colleges, and a culturally diverse sample representative of undergraduates at large, public southern universities). The robustness of this measurement model

**Table 5.** Correlations of New F-MPS2 Factors With Measures of Perfectionism and Hoarding.

	Evaluative concerns	Striving
Perfectionism		
APS discrepancy (Data Set 3)	.723**	.224**
APS standards (Data Set 3)	.251**	.684**
Hoarding		
OCI-R–Hoarding		
Data Set 1	.171*	.031
Data Set 2 <sup>a</sup>	.209**	.022
SIR–Total		
Data Set 2 <sup>a</sup>	.250**	–.002
Clinical sample	.225*	–.012
SIR–Acquisition		
Data Set 2 <sup>a</sup>	.262**	.023
Clinical sample	.337**	.049
SIR–Discarding		
Data Set 2	.137*	–.008
Clinical sample <sup>a</sup>	.218*	–.034
SIR–Clutter		
Data Set 2 <sup>a</sup>	.252**	–.016
Clinical sample	.083	–.033
SCI–Total (Clinical sample)	.344**	.123

Note. F-MPS2 = Frost Multidimensional Perfectionism Scale–2; APS = Almost Perfect Scale–Revised; OCI-R = Obsessive-Compulsive Inventory–Revised; SCI = Saving Cognitions Inventory.

<sup>a</sup>Indicates that for this data set, the correlation of S is significantly ( $p < .05$ ) lower than that of EC with the specific area of psychopathology. All correlations are pooled across five multiple imputation data sets.

\* $p < .05$ . \*\* $p < .001$  for correlation coefficients.

is supportive of the bidimensional conceptualization of intrapersonal perfectionism, which includes self-critical and goal-setting components. In a challenge to this multidimensional conceptualization of perfectionism, some have suggested that perfectionism is a unidimensional construct, and have labeled it “clinical perfectionism” to distinguish it from the multidimensional construct (Shafran, Cooper, & Fairburn, 2002). However, consistent with prior literature and the present investigation, the measure developed for assessing clinical perfectionism was found to be multidimensional, with the factors largely corresponding to the S and EC dimensions (Dickie, Surgenor, Wilson, & McDowall, 2012; Stoeber & Damian, 2014).

In comparison with the full measure, the F-MPS-Brief does not include items from the O, PC, or PE subscales. O was excluded because the construct has been found to be only tangentially related to perfectionism (Frost et al., 1990). Furthermore, because PE and PC represent developmental rather than central components of perfectionism, these items have often underperformed in relation to CM, DA, and PS subscales in previous factor-analytic evaluations of the F-MPS. Thus, with one exception, these items were all eliminated early in item reduction. Although the parental factors may be important to the development of perfectionism, they may not be inherent to the definition of the construct itself. Notably, these features remain relevant to understanding the development of perfectionism, and researchers should use the PE/PC items of the full F-MPS when they are interested in evaluating etiological factors.

Literature exploring cross-cultural differences is understandably common and needed given the rapidly diversifying demographics of the United States. However, the validity of these comparative investigations is often weakened by biased culture-related context variables and

measurement artifacts (Van der Vijver & Leung, 1997). In this study, the bidimensional model of the F-MPS-Brief fit well in a group of individuals with African heritage currently living in the United States. This finding provides initial evidence that the F-MPS-Brief may be useful for evaluating perfectionism within this group. Next, the two-factor model demonstrated scalar cross-cultural measurement equivalence across individuals of European and African descent. This suggests that (a) relationships between F-MPS-Brief scores and other variables, and (b) raw F-MPS-Brief scores may be directly compared between these groups. These results provide preliminary support for the use of the F-MPS-Brief with ethnically diverse samples as well as for within-group studies with this population specifically.

The validity of the F-MPS-Brief scores was assessed through its associations with similar or closely related constructs. The APS, another measure of perfectionism including self-critical and goal-setting components, related with the expected strength and direction to the F-MPS-Brief subscales (Pearson & Gleaves, 2006). Furthermore, the original F-MPS and shortened F-MPS-Brief subscales correlated with the APS to the same extent. This suggests that the new, shorter subscales are assessing the self-critical and goal-setting components of perfectionism well.

The EC subscale was consistently related to a variety of psychopathologies for both clinical and community samples. This pattern of results is consistent with the robust finding that EC is a transdiagnostic risk factor that is associated with poor mental health outcomes (Antony, Purdon, et al., 1998; Egan et al., 2011; Hewitt & Flett, 2002; Sassaroli et al., 2008). Previous research finds that the relationship of high goal setting to psychopathology is more complex, although certain studies find significant correlations with worry, eating disorders, and obsessive-compulsive behavior (DiBartolo et al., 2008; Dunkley et al., 2006; Handley et al., 2014; Sassaroli et al., 2008; Wu & Cortesi, 2009). The present results also reflect this inconsistent association and indicate that an examination of moderators affecting this S-to-psychopathology relationship would be particularly useful. In other words, greater focus might be drawn to understanding the conditions under which S does relate to negative outcomes. Of note, all EC and S item and subscale scores were higher for individuals in the clinical sample.

The current study should be considered in light of the following limitations. First, all the samples were predominantly female. Thus, the F-MPS-Brief may benefit from validation with more balanced or exclusively male samples. In addition, although the combination of multiple data sets may increase the generalizability of the findings, variance associated with the different procedures and time of collection (data sets span approximately 9 years) may have muddied the associations. Last, a prominent measure of perfectionism, the Multidimensional Perfectionism Scale (H-MPS) developed by Hewitt and Flett (1991), was unavailable in any of the data sets used for the present study. However, a comparison of the F-MPS-Brief with the H-MPS would be beneficial for supporting the validity of the new measure and its bidimensional structure.

In summary, the present investigation created a shortened version of the F-MPS that assesses the two constructs of the bidimensional model of perfectionism: EC and S. The new two-factor F-MPS-Brief demonstrated good factor structure across clinical and community samples, measurement invariance across two ethnic groups, high internal consistency, and strong construct validity. The F-MPS-Brief is suggested for use when a short yet high-functioning measure of the bidimensional model of perfectionism is needed.

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