College Academic Perfectionism Scale: Development and Validation

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Abstract

Maladaptive perfectionism has a documented association with mental health problems, yet the context of maladaptive perfectionism (i.e., the domain where individuals exhibit such a trait) is rarely considered. This study aimed to develop a measure for academic perfectionism among college students and assess its psychometric properties. Five hundred and thirty-two college students were recruited from introductory-level psychology courses and completed question-naires online. Exploratory and confirmatory factor analyses determined the factor structure and model fit of the scale, and bivariate correlation and multiple regression analyses assessed the validity of the scale. The results suggested that the College Academic Perfectionism Scale consists of two higher order factors, *rigid academic perfectionism* and *self-critical academic perfectionism*, and *self-critical academic perfectionism* consists of three sub-factors, *academic self-criticism*, *doubts about actions*, and *socially prescribed academic perfectionism*. The scale has an adequate confirmatory model fit, excellent reliability, and high construct validity. Incremental validity over general perfectionism was established.

Although the conceptualization of perfectionism varies across researchers, a large body of research considers perfectionism as a negative personality trait. However, it is pivotal to acknowledge that perfectionism can result in both positive and negative outcomes; whereas normal (i.e., positive) perfectionism is associated with pursuing realistic standards (i.e., perfectionistic strivings) and achieving self-satisfaction and self-esteem, neurotic (i.e., maladaptive) perfectionism involves overvaluing extremely high standards (i.e., maladaptive perfectionistic concerns) and engaging in harsh self-criticism when the standards are not met (Forst et al., 1990; Hamachek, 1978). In a review, Stoeber and Otto (2006) found that while perfectionistic strivings are only

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associated with positive outcomes, perfectionistic concerns are only associated with negative outcomes. Further, these two dimensions of perfectionism interact with each other; that is, whether perfectionistic strivings lead to positive or negative outcomes depends on one's level of perfectionistic concerns. These findings underscore the importance of a multidimensional approach to studying perfectionism and of identifying its potential negative consequences. Maladaptive perfectionism has been associated with several negative mental health outcomes, such as depression (Hewitt et al., 1996), anxiety (Gnilka et al., 2012), and lower self-esteem (Rice et al., 1998). Hence, advancing the scientific understanding of maladaptive perfectionism and developing precise measurements for this construct are of great clinical and educational relevance. Further, it is important to consider the domain in which individuals demonstrate perfectionistic traits; domain-specific measures consider when and where the personality is exhibited and the factors associated with the context and thus are of greater predictive value. In particular, academic settings may be especially threatening to students' development of maladaptive perfectionism. As measures of academic perfectionism integrating the latest conceptualization of perfectionism have not been developed, the present study focused on the development of a new measurement instrument to assess perfectionism in academic settings among college students.

Perfectionism: Domain-Specific or Domain-General?

To date, much research on perfectionism as a personality trait presumes that individuals with high levels of perfectionism desire to be perfect in every aspect of their lives. This generalization of behavior across all situations is characteristic of global, domain-general personality traits. However, the question of whether perfectionism is a global personality trait or a domain-specific construct (i.e., behavior that is specific to a situation or setting) has received great attention (Flett & Hewitt, 2002; Slaney et al., 2002). Research on perfectionism and other constructs suggests that domain-specific measures, compared to global, domain-general measures, can predict behavior and outcomes more accurately in their specific domains (Busseri & Mise, 2020; Dunn et al., 2005; Levine & Milyavskaya, 2018; Robinson & Rose, 2010; Sevi & Shook, 2021; Smith, Smoll, & Schutz, 1990R. E. Smith, Smoll, & Schutz, 1990). To illustrate, Dunn and colleagues (2005) examined perfectionism in intercollegiate student athletes and determined that participants exhibited higher perfectionism levels in sport than in school, pointing out that perfectionism levels would fluctuate across different situations. Domain-specific measures have also demonstrated advantages over domain-general measures in other areas, such as when assessing life satisfaction (Busseri & Mise, 2020) and, in a recent meta-analysis, risk-taking behaviors (Shou & Olney, 2020). However, when assessing perfectionism in academic settings, the majority of prior research has utilized measurements for global perfectionism, instead of domain-specific perfectionism. This may attenuate the relationships between domain-specific (i.e., academic) perfectionism and outcomes as domain-general measures would capture more error not explained by the domain-specific construct. Thus, the studies utilizing domain-general measures may generate inaccurate predictions of behavioral and educational outcomes (e.g., Bieling et al., 2003; Brown et al., 1999; Shou & Olney, 2020).

Existing Scales and Subscales

In previous research, perfectionism has often been assessed by two existing, prominent measures, the Frost Multidimensional Perfectionism Scales (FMPS; Frost et al., 1990) and Hewitt-Flett Multidimensional Perfectionism Scale (HF-MPS; Hewitt & Flett, 1991). Researchers have frequently combined subscales from these two measures to assess personal standard perfectionism and evaluative concern perfectionism; the former is usually assessed by the FMPS and has been

associated with both positive and negative outcomes, and the latter is usually assessed by the HF-MPS and has been documented to be related to only negative consequences (Hewitt & Flett, 2004; Smith et al., 2016; Stoeber & Otto, 2006). While this approach is not fundamentally flawed, and the two existing scales are still widely used, our current expanded understanding of perfectionism points to the necessity of the re-operationalization of perfectionism and development of new measures. Development of one more comprehensive and relevant measure may provide more efficient measurement and ensure greater incremental validity over present approaches (Smith et al., 2003, 2016). Hence, Smith and colleagues (2016) identified 10 aspects of perfectionism with three high-order factors and developed a new measure of perfectionism, the Big Three Perfectionism Scale (BTPS). *Rigid perfectionism*, as one of the higher-order factors, was designed to assess the rigidity of thoughts that one's performance must be flawless and consists of *self-oriented perfectionism* (being and pursing perfection is important) and *self-worth contingencies* (the tendency to base one's self-worth on extremely high standards). The second higher-order factor, *self-critical perfectionism*, comprises *concern over mistakes* (the tendency to negatively and overly react to perceived failures and mistakes), *doubts about actions* (feeling uncertain about one's performance), *self-criticism* (the tendency to involve in harsh self-criticism when performance is not satisfactory), and *socially prescribed perfectionism* (the tendency of having the perception of being asked to be perfect by others). The last higher-order factor of the measure is *narcissistic perfectionism*, which consists of *other-oriented perfectionism* (the tendency to set extremely high standards for others), *hypercriticism* (the tendency to over-criticize others and their performance), *entitlement* (the belief that one is perfect and should be treated specially), and *grandiosity* (the belief that one is perfect and superior to others).

To our knowledge, there is only one existing measurement for academic perfectionism (Malik & Ghayas, 2016). However, this scale is not based on the current conceptualization of perfectionism (i.e., it was developed based on the FMPS), so it may overlook some aspects of perfectionism captured by the HF-MPS and BTPS, limiting its utility to serve as a valid measurement in research settings and to provide clinically relevant information in professional settings. Hence, developing a new measurement for academic perfectionism incorporating the latest conceptualization would be tremendously beneficial to future inquiry of the construct. As a result, the purpose of the current study was to develop a new measurement, the College Academic Perfectionism Scale (CAPS), for perfectionism exhibited in academic settings among college students, derived from the most recently developed global scale, the BTPS. Harnessing this recent conceptualization of perfectionism, we proposed that the CAPS would comprise two high-order factors: *rigid academic perfectionism* and *self-critical academic perfectionism*. The subscales of these two higher-order factors were proposed to mirror the BTPS, based on the same underlying thinking patterns, but were endowed with an academic context (e.g., self-oriented perfectionism becomes self-oriented academic perfectionism: pursuing perfection in academic performance is important).

The BTPS higher-order factor *narcissistic perfectionism* was eliminated when developing the CAPS. Research suggests that the more narcissistic an individual is, the more likely they are to perceive their academic performance as excellent (de Lima et al., 2018). However, individuals with maladaptive perfectionism tend to set higher standards in academic settings, have discrepancy between the desired and actual grades, develop negative emotions, and perceive themselves as unprepared (Bieling et al., 2003). The discrepancy may be explained by the type of narcissism assessed and how perfectionism was operationalized. Stoeber et al. (2015) suggested that there are two forms of narcissism, grandiose and vulnerable narcissism, and that they show distinct relationships with different types of perfectionism and outcomes. Whereas narcissistic grandiosity is positively related to other-oriented perfectionism and higher sense of self-worth, narcissistic vulnerability is positively associated with socially prescribed perfectionism and lower sense of self-worth (Miller et al., 2011; Pincus & Roche, 2011). Domain-general perfectionism

measures capture only grandiose narcissism, overlooking vulnerable narcissism. Additionally, researchers have recently recommended the use of a three-factor model to study narcissism in which the two-factor model is further divided into agentic extraversion, antagonism, and narcissistic neuroticism (see Miller et al., 2021 for a review). Researchers interested in domain-general perfectionism should parse narcissistic perfectionism, considering all three dimensions of narcissism, in their future research. However, because redefining the construct will involve developing new items which isolate the specific facets of narcissism most relevant to perfectionism, and doing this along with applying it to the academic context was beyond the scope of the current study, narcissistic perfectionism was excluded from our measurement. Although we still expected to find a moderate correlation between narcissism and academic perfectionism, we maintained that these constructs are distinct and that narcissism is not a component of domain-specific academic perfectionism.

Maladaptive Perfectionism

Prior research has demonstrated that dimensions of maladaptive perfectionism are differentially associated with various psychological disorders and other negative indicators of well-being, such as depression (Hewitt et al., 1996; Moroz & Dunkley, 2015; Rice et al., 1998), anxiety (Gnilka et al., 2012), high levels of stress (Ashby et al., 2012; Rice & Van Arsdale, 2010), lower self-esteem (Dunkley et al., 2012; Moroz & Dunkley, 2015; Rice et al., 1998), difficulty in emotion regulation (Vois & Damian, 2020), obsessive-compulsive disorder (Sarafraz et al., 2020), and personality disorders (Stoeber, 2014). In addition, these associations have been observed in student populations (Bieling et al., 2003; Lee & Anderman, 2020; Stoeber & Rambow, 2007). Despite the robustness of these associations, causal relationships and the directionality of these associations largely have not been established. Although it is likely that perfectionistic concerns contribute to increased stress and mental health symptoms, it may also be that these symptoms play a role in increasing negatively oriented perfectionistic cognitions. Regardless of directionality, establishing an association between perfectionism and psychological maladaptation provides an additional tool identifying at risk students across multiple domains. Importantly, research suggests that adaptive and maladaptive perfectionists do not differ in their actual grades received, but rather in the goals they set and the emotions they display when receiving scores (e.g., Hanchon, 2010), suggesting that academic perfectionistic concerns, not strivings, may be associated with maladaptation just as observed with domain-general perfectionism. This indicates that one mechanism by which perfectionism can lead to psychological maladaptation is a maladaptive cognitive process whereby faltering in a particular domain becomes too integrated into one's overall self-worth and perpetuates a depressogenic attributional style. Therefore, we expected the CAPS to be negatively associated with psychological well-being above and beyond the contribution of domain-general perfectionism given the salience of the academic domain among the college student population and its importance for self-worth. Further, the domain-specific measure is likely most closely related to well-being given the extent to which stress and depression may influence maladaptive cognitions in the academic domain for students. Hence, we expected that higher scores on the CAPS would be related to worse psychological well-being, and this measure was expected to explain additional variance over and above domain-general perfectionism among college students.

Goals and Hypotheses

Given that there are very few existing domain-specific perfectionism measurements, particularly academic perfectionism, and the fact that these measurements are not based on the latest conceptualization of perfectionism, the goal of the current study was to develop the College Academic

Perfectionism Scale (CAPS) and assess its psychometric properties. This scale would be useful in both clinical and academic settings; while practitioners can utilize the measurement to identify whether students' mental health issues are related to academic perfectionism and employ targeted therapeutic approaches, the CAPS can also be administered by researchers interested in personality across different disciplines and contribute to the advancement of the scientific understanding of academic perfectionism.

We proposed that the CAPS would have two higher-order factors: *rigid academic perfectionism* and *self-critical academic perfectionism*. We expected *rigid academic perfectionism* to have two sub-factors: *self-oriented academic perfectionism* and *academic self-worth contingencies*, and *self-critical academic perfectionism* to have four sub-factors: *concern over mistakes*, *doubts about actions*, *academic self-criticism*, and *socially prescribed academic perfectionism*, in line with the existing measure of domain-general perfectionism, the Big Three Perfectionism Scale (BTPS; Smith et al., 2016). As for convergent and divergent construct validity, the CAPS was expected to be strongly related to the BTPS and closely related constructs (i.e., neuroticism, obsessive-compulsive personality, and self-criticism) as well as to measures of maladaptive psychological outcomes (i.e., depression, anxiety, stress, emotion dysregulation, student burnout, lower self-esteem, and lower self-efficacy). It was expected to be only moderately related to narcissism, conscientiousness, and student engagement because previous research has demonstrated that maladaptive perfectionism is more strongly related to cognitions (e.g., perfectionistic concerns and expectations) than actual behavior and performance. So, these measures were expected to correlate moderately with academic perfectionism but not as highly as the convergent measures of psychological well-being. Importantly, these moderate associations were intended to establish that the CAPS could distinguish engaged, conscientious students without high levels of perfectionistic concerns from those with these maladaptive cognitions. Lastly, the CAPS was proposed to be weakly related to divergent constructs (i.e., extraversion, openness, agreeableness, effortful control, and professional efficacy). Although perfectionism is associated with emotion dysregulation, effortful control concerns utilizing positive behavioral strategies to regulate one's emotion (e.g., directing attentional resources), and academic perfectionism was not expected to be associated with specific behaviors. The CAPS was not expected to be strongly related to overall academic performance, given the evidence presented above about the dissociation between performance and perfectionistic concerns. Moreover, the CAPS was hypothesized to have incremental validity over global perfectionism when predicting stress, anxiety, and depression, to illustrate that academic perfectionism is a useful and distinct construct from global perfectionism.

Methods

Item Generation

Five to 6 items were generated for each of the 6 proposed factors: *self-oriented academic perfectionism*, *academic self-worth contingencies*, *concern over mistakes*, *doubts about actions*, *academic self-criticism*, and *socially prescribed academic perfectionism*. Thirty-two items were written on a 6-point Likert scale, with "1" indicating "Strongly Disagree" and "6" indicating "Strongly Agree," and then reviewed and revised by an expert who conducts research on college students' academic achievement, mental health, and psychometrics.

Participants and Procedures

Six-hundred and fifty students in introductory-level psychology courses at an ethnically and socio-economically diverse university were recruited to complete an online survey. The responses were

screened by attention-checking questions (e.g., answer "2" to this question) to ensure their validity; individuals who answered more than 3 out of 10 attention-checking questions wrong were eliminated from the analyses. Participants were also asked whether their responses should be used in the study, and those who answered "no" were excluded from the analyses. As a result, data from 532 participants were used (48.3% Hispanic, 12% Asian, 10.7% white, 5.3% Black, and 8.6% Biracial/Multiracial, with 15% who did not provide ethnicity information). As for gender, 63.9% identified as female, 20.7% as male, and 1.3% did not identify as either female or male, with 14.1% who did not provide gender information. Additionally, 30.3% of the participants were freshmen, 27.8% sophomores, 17.1% juniors, 8.5% seniors, and 0.6% Master's students, with 15.8% who did not provide academic rank information. Finally, 57.7% of the participants identified as first-generation college students, and 27.1% did not, with 15.2% who did not provide generational status information. Participants received credits for their participation to fulfill a course research requirement.

All the measures were administered online through Qualtrics. Participants completed the survey anonymously on their own electronic devices. The informed consent form was provided in the beginning of the survey and had to be electronically signed by the participants in order to continue the study. The demographic and academic (i.e., GPA) information was collected separately through the participant pool pre-screener. All measures and procedures were approved by the Institutional Review Board of the university.

Measures

Maslach Burnout Inventory—Student Survey (MBI-SS; Schaufeli et al., 2002**).** This 15-item scale (α = .89) measures burnout in university students on a 7-point scale, ranging from 0 (never) to 6 (always), and includes three subscales: exhaustion, cynicism, and professional efficacy. The professional efficacy subscale items were reverse-scored.

Utrecht Work Engagement Scale—Student (UWES-S; Schaufeli et al., 2002**).** This 14-item scale (α = .94) measures engagement in university students on a 7-point scale, ranging from 0 (never) to 6 (always), and includes three subscales: vigor, dedication, and absorption.

Generalized Anxiety Disorder 7-item Scale (GAD-7; Spitzer et al., 2006**).** This 7-item scale (α = .92) measures general anxiety symptoms on a 4-point scale, ranging from 0 (not at all) to 3 (nearly every day).

Rosenberg Self-Esteem Scale (Rosenberg, 1965). This 10-item scale (α = .90) measures global self-esteem on a 4-point scale, ranging from "Strongly Disagree" to "Strongly Agree."

Big Three Perfectionism Scale (BTPS; Smith et al., 2016**).** This 45-item scale (α = .95) measures global perfectionism on a 5-point scale, ranging from 1 (Disagree Strongly) to 5 (Agree Strongly), and includes 3 high-order factors (rigid, self-critical, and narcissistic perfectionism) and 10 sub-factors.

Center for Epidemiological Studies Depression Scale (CES-D; Radlof, 1977**).** This 20-item scale (α = .93) measures depressive symptoms on a 4-point scale, ranging from "rarely or none of the time" to "most or all of the time."

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004**).** This 36-item scale (α = .95) measures one's ability to regulate their emotion on a 5-point, ranging from 1 (Almost Never) to 5 (Almost Always).

Perceived Stress Scale (Cohen et al., 1983**).** This 10-item scale (α = .72) measures personal stress on a 5-point scale, ranging from 0 (never) to 4 (very often).

The Levels of Self-Criticism Scale (Thompson & Zuroff, 2004**).** This 22-item scale (α = .86) measures self-criticism on a 7-point scale, ranging from 1 (not at all) to 7 (very well), and includes 2 sub-factors: comparative self-criticism and internalized self-criticism.

Big Five Inventory (BFI; John & Srivastava, 1999**).** This 44-item scale measures 5 dimensions of personality (extraversion, agreeableness, conscientiousness, neuroticism, and openness) on a 5-point scale, ranging from 1 (Disagree Strongly) to 5 (Agree Strongly). Reliability analysis was performed for each of the personality dimensions and revealed acceptable to good reliability, with α's ranging from .70 to .83.

Adult Temperament Questionnaire—Effortful Control Scale (Evans & Rothbart, 2007**).** This 35-item scale ($\alpha = .90$) measures 3 dimensions of effortful control (inhibitory control, activation control, and attentional control) on a 7-point scale, ranging from 1 (Extremely Untrue) to 7 (Extremely True).

Obsessive-Compulsive Inventory – Revised (OCI-R; Foa et al., 2002**).** This 18-item scale ($\alpha = .90$) measures obsessive-compulsive symptoms on a 5-point scale, ranging from 0 (not at all) to 4 (extremely).

General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995**).** This 10-item scale ($\alpha = .87$) measures perceived self-efficacy on a 4-point scale, ranging from 1 (not at all) to 4 (exactly true).

Personality Beliefs Questionnaire (PBQ; Butler et al., 2007**).** The narcissistic (7 items; $\alpha = .82$) and obsessive-compulsive (7 items; $\alpha = .81$) personality disorder subscales measure levels of narcissistic and obsessive-compulsive personality disorders on a 5-point Scale, ranging from 0 (I don't believe it at all) to 4 (I believe it totally).

Analytic Plan. Exploratory factor analysis was performed in IBM SPSS Statistics for Windows (Version 27.0; IBM Corporation, 2021), using principal axis factoring as the extraction method. Because the factors were assumed to be correlated, Promax was chosen as an oblique rotation method. A randomly selected subsample of approximately half of the participants (N = 262) was used for exploratory factor analysis.

Parallel analysis was also conducted to determine the factor solution. Following Hayton et al. (2004), the vector of the mean eigenvalues of 1000 randomly simulated solutions was computed, and these eigenvalues were compared to the actual eigenvalues obtained from the data. Only the factors in which the actual eigenvalues were greater than the simulated ones were retained.

Next, confirmatory factor analysis was performed on the hold-out sample (N = 270) in MPlus (Version 6.12; Muthen & Muthen, 1998-2011). The chi-square goodness-of-fit, standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), and comparative fit index (CFI) were employed as the model fit indices. An ideal fit is considered by a non-significant chi-square test, SRMR of .08 or lower, RMSEA of .06 or lower, and CFI of .95 or greater (Hu & Bentler, 1999).

Bivariate correlations were conducted to establish convergent and divergent construct validity. In addition, hierarchical regression analyses were conducted to assess the incremental validity of the scale when predicting stress, anxiety, and depression over global perfectionism. Finally, multivariate regression analysis was conducted to account for the overlap between the dependent variables.

Results

Exploratory Factor Analysis

On the scree plot (see Figure 1), the slope dropped drastically after the third and the fifth factor, indicating a possible 2-factor or 4-factor solution. Seven factors had an eigenvalue above 1. Based on the scree plot, eigenvalues, the percentage of variance explained, and theory, a 4-factor solution was determined, explaining 57.14% of variance. Five items were eliminated from the scale because they either would decrease the reliability of the scale or had cross-loading issues, resulting in 27 items remaining with $\alpha = .92$. Consistent with the 4-factor solution, the fourth simulated
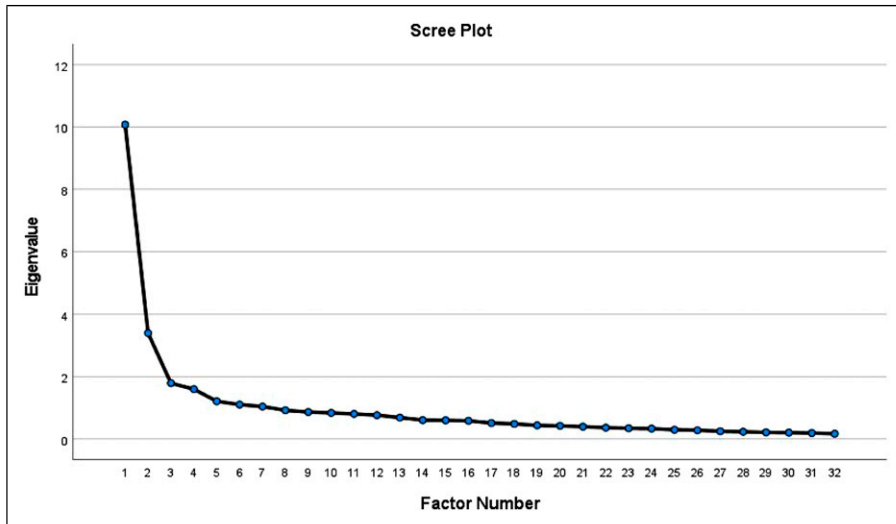
Figure 1. Scree plot from the exploratory factor analysis.

eigenvalue from the parallel analysis (1.407) was smaller than the fourth eigenvalue from the exploratory factor analysis (1.414), while the fifth simulated eigenvalue (1.252) was larger than the fifth actual eigenvalue (.992).

Items and factor loadings are displayed in Table 1. Items 1–6 loaded on the factor *self-oriented academic perfectionism* (SOP; α = .85). Items 7–14 and 19–23 loaded on the factor *academic self-criticism* (SC; α = .92). Items 15–18 loaded on the factor *doubts about actions* (DAA; α = .81). Finally, items 24–27 loaded on the factor *socially prescribed academic perfectionism* (SPP; α = .73). All the items loaded on their intended factors, but items from the intended *academic self-worth contingency* and *concern over* mistakes subscales all loaded on the *academic self-criticism* subscale. Factor correlations are displayed in Table 2.

Confirmatory Factor Analysis

We then proposed a hierarchical structure where SC, DAA, and SPP were nested within the higher-order factor *self-critical academic perfectionism* (SCP), and SOP itself served as another higher-order factor (Figure 2). We tested this hierarchical model in the confirmatory factor analysis. The results revealed a $\chi^2 = 878.388$, $p < .001$; RMSEA = .08; CFI = .83; and SRMR = .08. Although the chi-square test was significant and CFI did not meet the standard for excellent fit, SRMR did meet the expected criteria, and the RMSEA fell within the acceptable range (Browne & Cudeck, 1992). Importantly, Hu and Bentler (1999) suggest that the combination of RMSEA and SRMR is particularly useful in assessing fit. Further, Hu and Bentler's (1999) recommended cutoff points have been suggested to be too restrictive, in particular for CFA models, and CFI has been suggested to be more appropriate in exploratory contexts, instead of confirmatory (Marsh et al., 2004; Rigdon, 1996). Therefore, we concluded that the model fit indices suggested an acceptable, though not ideal, model fit.

Construct Validity

Tables 3 and 4 display the correlations between the CAPS and convergent and divergent validity measures, respectively. CAPS was strongly associated with most of the convergent validity

Table 1. Items and structure matrix factor loadings.

Items	Factors			
	1	2	3	4
1. Getting a perfect score on a school assignment is not important. (R; SOP)	.340	**.420**	.167	.095
2. I desire to get perfect grades in school. (SOP)	.496	**.739**	.220	.196
3. I do my best to get a perfect score on a school assignment. (SOP)	.267	**.788**	.179	.070
4. I prioritize things that can help me get perfect scores on an exam. (SOP)	.223	**.769**	.036	.017
5. I have a strong need to get straight A's in school. (SOP)	.490	**.827**	.148	.157
6. I strive to perform as perfectly as possible on an exam. (SOP)	.339	**.783**	.144	.118
7. When I do not make a perfect score on an exam, my self-esteem suffers. (SWC)	**.724**	.438	.441	.453
8. My self-worth does not depend on my academic performance. (R; SWC)	**.511**	.165	.186	.282
9. I do not feel "right" if I don't get a perfect score on a school assignment.* (SWC)	**.712**	.496	.268	.389
10. Academic success makes me who I am. (SWC)	**.621**	.361	.171	.319
11. I could not respect myself if I didn't try my best to achieve perfection in academic performance. (SWC)	**.499**	.298	.320	.348
12. Trying my best for even a small assignment makes me feel worthwhile.* (SWC)	.330	.346	.241	.182
13. If I make a mistake on an exam that I should not have made, I feel angry. (COM)	**.670**	.254	.404	.377
14. If I make a mistake in a school assignment that I should not have made, I feel ashamed. (COM)	**.779**	.194	.482	.573
15. I am very afraid of being deducted points on school assignments. (COM)	**.714**	.312	.505	.483
16. Not doing well on an exam wouldn't bother me much. (R; COM)*	.458	.379	.214	.121
17. Making a small mistake on a school assignment would upset me. (COM)	**.696**	.330	.467	.345
18. I almost always feel uncertain about my performance right after an exam. (DAA)	.397	.092	**.747**	.360
19. I am often worried about whether I am doing a school assignment correctly. (DAA)	.394	.210	**.782**	.315
20. I am concerned about whether I meet my professors' expectations. (DAA)	.512	.322	**.734**	.445
21. I never doubt about whether I understand the class materials correctly. (R; DAA)*	.176	−.008	.334	−.005
22. I have doubts about my academic competence regardless of how well I am doing in the class. (DAA)	.406	−.069	**.629**	.484
23. When my scores are not perfect, I don't blame myself. (R; SC)	**.425**	.132	.318	.217
24. I criticize myself harshly when I don't get a perfect score on an exam. (SC)	**.780**	.294	.511	.497
25. I am disappointed with myself when a professor points out my mistake. (SC)	**.545**	.034	.503	.459
26. I have a hard time forgiving myself when my performance on an exam is not flawless. (SC)	**.784**	.352	.502	.504
27. I am angry with myself when my performance on an assignment is not perfect. (SC)	**.824**	.337	.526	.476
28. My parent(s) will be disappointed in me if I don't make straight A's in school. (SPP)	.329	.168	.187	**.453**
29. My professors would be disappointed in me if I don't perform perfectly in their classes. (SPP)	.417	.198	.396	**.666**

Table 1. (continued)

	Factors			
Items	1	2	3	4
30. My friends will look down on me if I don't get perfect grades in school. (SPP)	.388	.070	.291	**.698**
31. If I don't do perfectly on an exam, my classmates will see me as incompetent. (SPP)	.422	−.021	.331	**.739**
32. People around me don't expect me to perform perfectly in school. (R; SPP)*	.096	.283	-.048	.178

Note. R = reverse-scored; * = item removed from final scale; SOP = self-oriented perfectionism; SWC = self-worth contingencies; COM = concern over mistakes; DAA = doubts about actions; SC = self-criticism; SPP = socially prescribed perfectionism. Factor abbreviations after the items indicate the factors on which the items were expected to load.

Table 2. Factor correlations.

	SOP	SC	DAA	SPP
SOP	1			
SC	.449**	1		
DAA	.153**	.544**	1	
SPP	.200**	.575**	.399**	1

Note. SOP = self-oriented perfectionism; SC = self-criticism; DAA = doubts about actions; SPP = socially prescribed perfectionism; ** $p < .001$.
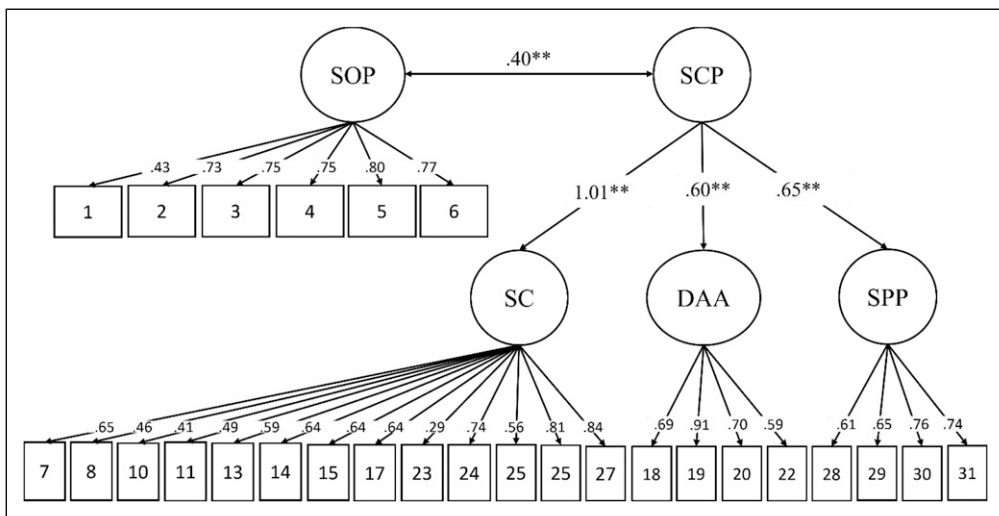

Figure 2. Final hierarchical structure. Note. SOP = self-oriented perfectionism; SCP = self-critical perfectionism; SC = self-criticism; DAA = doubts about action; SPP = socially prescribed perfectionism; ** < .001. Item scores were used in the confirmatory factor analysis.

measures and moderately to weakly associated with the divergent validity measures, indicating great construct validity.

Incremental Validity

The incremental validity of the CAPS was assessed by how much more variance it explained than the BTPS (Table 5). The hierarchical regression analyses revealed significant incremental validity of the CAPS when predicting stress ($\Delta R^2 = .023$, $\beta = .189$, $p = .008$), anxiety ($\Delta R^2 = .041$, $\beta = .253$, $p < .001$), and depression ($\Delta R^2 = .030$, $\beta = .217$, $p = .002$). The multivariate regression analysis corroborated the findings; the whole model ($\Lambda = .676$, $F = 42.109$, $df = 3$, $p < .001$), BTPS ($\Lambda = .941$, $F = 5.463$, $df = 3$, $p < .001$), and CAPS ($\Lambda = .949$, $F = 4.704$, $df = 3$, $p = .003$) were all significant.

Table 3. Correlations between CAPS and convergent validity measures.

	CAPS	p-value
Big Three Perfectionism	.595	< .001
Stress	.329	< .001
Anxiety	.400	< .001
Depression	.365	< .001
Emotion dysregulation	.406	< .001
Neuroticism	.372	< .001
Self-esteem	−.321	< .001
Burnout	.154	.006
Self-criticism	.593	< .001
Self-efficacy	−.058	.340
Obsessive-compulsive personality	.579	< .001
Obsessive-compulsive disorder	.321	< .001

Note. Standard α = .05; Bonferroni corrected α = .004.

Table 4. Correlations between CAPS and divergent validity measures.

	CAPS	p-value
Expected moderate correlations		
Narcissism (BTPS)	.161	.008
Narcissism (PBQ)	.152	.012
Student engagement	.127	.036
Conscientiousness	.081	.184
Expected weak correlations		
Agreeableness	−.139	.023
Extraversion	−.111	.069
Openness	.037	.550
Effortful control	−.001	.990
Professional efficacy	−.104	.065
GPA	.103	.093

Note. Standard α = .05; Bonferroni corrected α = .005.

Table 5. Hierarchical regression analyses predicting stress, anxiety, and depression.

	Stress					Anxiety					Depression				
	b	SE	β	p	ΔR^2	b	SE	β	p	ΔR^2	b	SE	β	p	ΔR^2
Step 1					.129**					.155**					.142**
BTPS	.083	.013	.359	< .001		.087	.012	.394	< .001		.178	.027	.377	< .001	
Step 2					.023*					.041**					.030*
BTPS	.057	.016	.246	.001		.054	.015	.243	< .001		.117	.033	.248	< .001	
CAPS	.063	.023	.189	.008		.081	.022	.253	< .001		.148	.047	.217	.002	

Note. BTPS = Big Three Perfectionism Scale; CAPS = College Academic Perfectionism Scale; * < .01; ** < .001.

Discussion

The exploratory and confirmatory factor analyses suggested that the CAPS has two higher-order factors, *self-oriented academic perfectionism* and *self-critical academic perfectionism*, and *self-critical academic perfectionism* consists of three sub-factors, *academic self-criticism*, *doubts about actions*, and *socially prescribed academic perfectionism*. Inconsistent with the BTPS, the existing domain-general perfectionism scale, the *self-worth contingency* and *concern over mistakes* sub-factors did not emerge, but rather these items loaded on the *academic self-criticism* sub-factor, underscoring the common characteristic of "influencing one's self-worth and/or emotion" among these three sub-factors. In addition to *self-criticism*, the remaining emerged factors also touch on differential facets of academic perfectionism: the *self-oriented academic perfectionism* factor represents one's desire to pursue perfection, the *doubts about actions* factor represents one's doubting behavior and worries regarding being perfect, and the *socially prescribed academic perfectionism* factor represents the tendency to actively perceive social pressure that drives perfectionism. *Self-oriented academic perfectionism*, as a higher-order factor, emphasizes "thoughts" as the motivating factor for academic perfectionism, while *self-critical academic perfectionism*, as the other higher-order factor, underlies various behaviors as the consequences of pursuing, or thinking about pursuing, perfection.

The scale and subscales all exhibited great internal consistency. Convergent validity was established by strong correlations between the CAPS and related and maladaptive constructs (e.g., domain-general perfectionism, stress, anxiety, depression, and self-criticism). Moderate to weak correlations with the less relevant and nonrelevant constructs (e.g., narcissism, agreeableness, and openness) indicated great divergent construct validity. Interestingly, self-efficacy did not correlate strongly with the CAPS as expected, possibly due to the separation between ability and desire/thoughts in perfectionism; in other words, striving for perfection does not equal perceived incompetence. The non-significant weak correlation between the CAPS and GPA also corroborated this dissociation of ability and thoughts.

The incremental validity of the CAPS over domain-general perfectionism when predicting stress, anxiety, and depression was established using hierarchical regression analyses. It suggested that academic perfectionism is indeed a construct associated with maladaptation, but more importantly, it is a relatively distinct construct from domain-general perfectionism, predicting stress, anxiety, and depression above and beyond general perfectionism. This has significant implications for counseling and advising college students by identifying a potential driving factor of students' mental health issues.

Limitations

There are several limitations with the scale. First, participants were recruited from introductory psychology courses at an ethnically diverse institution, who were mostly Hispanic underclassmen. Whether the scale is equally valid in other student populations needs further investigation. In addition, the model fit indices only suggested an acceptable fit, pointing to the necessity of advancing our understanding and theories of academic perfectionism to capture a more accurate model of the construct. As mentioned, narcissistic perfectionism was eliminated when developing the measure. Future research should consider re-operationalizing perfectionism by taking the three-factor model of narcissism into account to potentially improve model fit. Moreover, the quality of the scale (i.e., reliability and validity) was assessed at the whole-scale level, using the classical test theory approach. Harnessing the item response theory approach, assessing the quality of the scale at the item-level, could better improve the quality of the scale in future research. Finally, the directional relationships between academic perfectionism (or domain-general perfectionism) and psychological well-being have rarely been addressed and should be accounted for with future longitudinal designs.

Implications and Future Directions

The CAPS can be used as an assessment tool for practitioners who work with the college student population. Universities and colleges can administer this measure to all students to identify students who score high on academic perfectionism and then follow up to ensure the mental health of these students. In addition, when working with students with mental health issues, school psychologists and counselors can utilize this measure to identify whether the problems are related to academic perfectionism specifically; the subscales could provide insight into where the problematic thought process is and the degree to which each aspect of academic perfectionism is detrimental, so that more precise therapeutic approaches targeting these specific issues can be employed. On the other hand, researchers in the fields of adolescent development, education, personality, and clinical psychology can use the scale to further our understanding of academic perfectionism and its associated maladaptation, as this construct is relatively new and under-researched. To our knowledge, the CAPS is the first measure that not only integrates the latest conceptualization of perfectionism but also considers the academic context. The scale provides opportunities to scrutinize the construct and associated measures of well-being more accurately, compared to using global perfectionism scales, and thus reinforces researchers' need to consider the domain in which the personality trait is exhibited. Moreover, exploring pathways from early experiences to academic perfectionism and maladaptation can have significant implications for promoting adaptation among college students. Identifying the mechanisms by which early experiences lead to academic perfectionism longitudinally can contribute to the development of evidence-based interventions, which can further lead to better student retention, persistence, and mental health.

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