Article

Validation of the Short Form of the Academic Procrastination Scale

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Abstract
The factor structure, internal consistency reliability, and convergent validity of the five-item Academic Procrastination Scale–Short Form was investigated on an ethnically diverse sample of college students. The results provided support for the Academic Procrastination Scale–Short Form as a unidimensional measure of academic procrastination, which possessed good internal consistency reliability in this sample of 282 students. The scale also demonstrated good convergent validity, with moderate to large correlations with both the Procrastination Assessment Scale–Students and the Tuckman Procrastination Scale. Implications of the results are discussed and recommendations for future work provided.

Procrastination is very common among college students, with 95% to 99% of students identifying themselves as procrastinators (Ellis & Knaus, 1977; Day, Mensink, & O'Sullivan, 2000), and between 32% and 46% of students procrastinating in a chronic manner (Solomon & Rothblum, 1984; Clark & Hill, 1994). This is important, as procrastination has been found to be negatively related to examination scores and grades, and positively related to symptoms of stress, depression, visits to medical professionals, course withdrawal, and course failure (Solomon & Rothblum, 1984; Tice & Baumeister, 1997; Doherty, 2006).

Given both the prevalence of procrastination among college students and its potential adverse effects, having psychometrically sound measures of procrastination is critical. While a number of scales exist for measuring procrastination

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in general, including both univariate (Lay, 1986; Tuckman, 1991) and multivariate (e.g., Chu & Choi, 2005) measures, only a handful of scales are available that were specifically designed for measuring procrastination on academic tasks. This is important, since much work on procrastination focuses on the academic setting (e.g., Bridges & Roig, 1997; Onwuegbuzie, 2004; Klassen, Krawchuk, & Rajani, 2008). Two of the more commonly used scales to measure procrastination in the academic setting are the Procrastination Assessment Scale–Students (PASS; Solomon & Rothblum, 1984) and the Tuckman Procrastination Scale (Tuckman, 1991). The 12-item PASS, which has been cited as the most commonly used measure of academic procrastination (Ferrari, Johnson, & McCown, 1995; Harrington, 2005) focuses on procrastination on specific types of academic tasks (e.g., term papers, examinations, weekly readings, administrative academic-related tasks), and has been shown to possess fairly good estimates of reliability and validity. The 16-item Tuckman Scale, while consisting predominantly of items that measure general rather than academic procrastination, is commonly used in academic settings and possesses good estimates of reliability and validity.

One scale recently developed to measure procrastination specifically in the academic setting is the Academic Procrastination Scale (APS; McCloskey, 2011). While both the APS and PASS consist predominantly of items pertaining to the academic setting, the APS was designed with a focus on measuring general academic procrastination, with less emphasis on specific types of academic tasks, such as procrastinating while writing a term paper. In a validation study on 622 participants, McCloskey (2011) found that the full-length 25 Likert-type item APS (a) showed a very good internal consistency reliability estimate ($\alpha = .94$), (b) had good convergent validity, with moderate to high correlations with other procrastination measures such as the PASS and Tuckman Scale, and (c) consisted of one predominant component, accounting for approximately 43% of the variance. While the full-length version of the APS showed promising psychometric properties, because both the scale is fairly long at 25 items and several items on the scale were highly similar, McCloskey (2011) also proposed a shorter five-item version of the scale, selecting items from the full-length scale that had some of the most promising psychometric properties (i.e., item-total correlations greater than .70).

While the full-length version of the APS showed promising psychometric properties in the initial study by McCloskey (2011), to the best of the author's knowledge, the reliability and validity of the short form of the scale have yet to be investigated in an undergraduate sample. Investigating the short form of the scale is important because, while longer length measures of procrastination exist (e.g., 18-item Tuckman scale, 12-item PASS, 20-item Lay procrastination scale; Lay, 1986), a more parsimonious 5-item scale, particularly one that focuses on academic tasks, would provide researchers with an efficient option for assessing academic procrastination in their studies.

Research goal. To investigate the psychometric properties of the Academic Procrastination Scale–Short Form (APS-S); specifically, the reliability, convergent validity, and factorial validity of the five-item scale were investigated using an ethnically diverse sample of college students.

Method

Participants

The short form of the APS-S was administered to a sample of 284 students (71% female, $n = 201$; M age $= 22.6$ yr., $SD = 3.9$, range $= 18$ to 47) at a university in the Western United States. The sample was ethnically diverse, with 42% ($n = 120$) reporting as Hispanic, 29% ($n = 81$) Caucasian, 12% ($n = 35$) Asian American, 7% ($n = 19$) African American, and 10% ($n = 28$) "other". Along with completing the short form of the APS-S, participants also completed either the Tuckman Procrastination Scale (Tuckman, 1991) or the PASS.

Measures

The PASS is a 12-item five-point Likert-type scale that measures the frequency with which students procrastinate on specific types of academic tasks, including term papers, examinations, and reading assignments. For the 12-item scale, respondents are asked the following two questions in each of six different areas: "To what degree do you procrastinate on this task," (anchors 1: Never procrastinate, and 5: Always procrastinate) and "To what degree is procrastination on this task a problem for you?" (anchors 1: Not at all a problem, and 5: Always a problem). Possible scores on the PASS range from 12 to 60, with higher scores indicating a greater tendency to procrastinate. Onwuegbuzie (2004) reported an internal consistency estimate of .84 for the PASS on a sample of 135 graduate students, and total scores have been found to correlate positively with measures of depression and irrational cognitions, and negatively with measures of self-esteem and punctuality (Solomon & Rothblum, 1984).

The Tuckman Procrastination Scale is a 16-item measure of procrastination. Sample items include "I needlessly delay jobs, even when they're important," and "I always finish important jobs with time to spare." Possible responses range from 1: "That's me for sure," to 4: "That's not me for sure." Total possible scores range from 16 to 64, with higher scores indicating a greater tendency to engage in procrastination. Tuckman (1991) reported a Cronbach's α of .90 in his original work, with estimates of .89 and .92 reported in other samples (Tuckman, 1998, 2005). The validity of the scale has been supported through exploratory factor analyses as well as a correlation of $r = -.54$ between the Tuckman scores and a measure of self-regulation (Tuckman, 1991).

Finally, the APS-S (McCloskey, 2011) is a five-item Likert-type scale with anchors 1: Agree to 5: Disagree, with the items for the short form of the scale originally selected from the 25-item full length scale. Instructions for competing the scale consisted of asking participants "How much do you, yourself agree to the following statements?" (p. 57; McCloskey, 2011). Higher scores on the scale indicate a greater tendency to procrastinate on academic tasks. Based on a sample of 622 participants, McCloskey (2011) reported an internal consistency reliability estimate of .93 for the full-length scale. Significant correlations were reported for the full-length APS-S with other measures of procrastination, including the Tuckman Scale ($r = .70$) and the PASS ($r = .53$). The full-length APS was also negatively correlated with conscientiousness ($r = -.57$) and, using a subset of 566 participants, was negatively related to semester GPA ($r = -.23$) (McCloskey, 2011).

Procedure

The questionnaire was administered online to students enrolled in three different psychology courses: a lower division introductory statistics course, an upper division intermediate statistics course, and an upper-division capstone psychology course. The introductory statistics class serves students from a variety of different majors in both the social and natural sciences, while the other two classes are taken predominantly by psychology students. All students received extra credit for participating in the study. After providing informed consent, participants completed the questionnaire online. Of the 284 participants, one person who did not answer all of the questions on the APS-S and another who completed the survey twice (with slightly different answers) were excluded from the analyses, resulting in a final sample of 282 participants. Along with completing demographic questions and the APS-S, one subset ($n = 98$) of the participants completed the PASS, while another subset ($n = 71$) completed the Tuckman Scale.

Results

The mean items on the APS-S ranged from 2.34 ("I know I should work on schoolwork, but I just don't do it") to 3.15 ("I get distracted by other, more fun, things when I am supposed to work on schoolwork"), with standard deviations ranging from 1.14 to 1.24 (Table 1). The mean of the five-item total scale was 13.52 ($SD = 4.81$), with skew = .113 ($SE = 0.15$), and kurtosis = $-.887$ ($SE = 0.29$). Inter-item and corrected item-total correlations ranged from .49 to .74 and .60 to .75, respectively.

Principal components analysis (PCA) of the APS-S was conducted, as Bartlett's test of sphericity indicated that the correlation matrix was significantly different from an identity matrix $\left(x^2 = 664.01, p < .001\right)$. With 282

Table 1. Means, standard deviations, and component loadings of the items on the APS-S (N = 282).

Item	M	SD	Component Loading
1. I put off projects until the last minute.	3.10	1.15	.82
2. I know I should work on schoolwork, but I just don't do it.	2.34	1.20	.78
3. I get distracted by other, more fun, things when I am supposed to work on schoolwork.	3.15	1.14	.73
4. When given an assignment, I usually put it away and forget about it until it is almost due.	2.57	1.23	.85
5. I frequently find myself putting important deadlines off.	2.36	1.24	.86
Total score	13.52	4.81	–

Note. These items correspond to items 2, 4, 7, 17, and 23 as selected by McCloskey (2011) from his full-length scale. As reported in the appendix in the original study (p. 57; McCloskey, 2011), each item uses a 5-point Likert scale, where 1 = Disagree and 5 = Agree.

participants, the PCA on the five-item scale was conducted with a subject to variable ratio above 56 to 1, far exceeding the recommended minimum subject to variable ratio of 10 (Nunnally, 1978, p. 421). Both eigenvalue > 1 (Kaiser, 1960) and scree plot (Cattell, 1966) criteria indicated a one-component solution (eigenvalues: 3.26, 0.65, 0.45, 0.39, and 0.25), which accounted for 65% of the variance. A parallel analysis (Horn, 1965; O'Connor, 2000) was also conducted and indicated a one-component solution as well, as only the first eigenvalue from the PCA (3.26) exceeded its respective cutoff value obtained from the parallel analysis (parallel analysis cut-off values: 1.17, 1.07, 1.00, 0.93, 0.84), with all other eigenvalues falling short of their respective parallel analysis-derived cutoff values. Component loadings on the APS-S were high, ranging from .73 to .86 (Table 1).

The internal consistency reliability estimate was .87 (Cronbach's α). The APS-S also showed good estimates of convergent validity, with significant correlations with both the PASS ($r(96) = .54$, $p < .001$) and Tuckman Scale ($r(69) = .79$, $p < .001$). Finally, a 2 (gender) x 4 (ethnicity, 'other' category excluded due to small N) ANOVA on APS-S total scores indicated a significant main effect for gender ($F(1, 246) = 6.05$, $p = .02$, partial $\eta^2 = 0.02$, Cohen's $d = 0.32$), with males ($M = 14.74$, $SD = 4.83$) reporting significantly higher scores than females ($M = 13.02$, $SD = 4.72$). However, there was no significant main effect of ethnicity ($F(3, 246) = 0.42$, $p > .05$, partial $\eta^2 = 0.01$), nor was there a significant interaction ($F(3, 246) = 0.37$, $p > .05$, partial $\eta^2 = 0.004$).

Discussion

The results indicated that the APS-S is a unidimensional measure of academic procrastination, with good estimates of internal consistency reliability and convergent validity. The high correlation of the more parsimonious five-item APS-S with the 16-item Tuckman Scale was particularly impressive, considering that the longer Tuckman Procrastination Scale is a commonly used measure of procrastination. That the APS-S shared more variance with the Tuckman scale (62%) than with the PASS (29%) is understandable, as the Tuckman scale and APS-S tend to measure procrastination in a general sense, while the PASS focuses exclusively on specific academic tasks, such as term papers and reading assignments.

While the current study assessed the reliability and validity of the APS-S on an ethnically diverse sample of undergraduate students, further investigation of the scale is warranted. Assessing the reliability and validity of the APS-S with students of other age groups (e.g., graduate students, high school students) and academic disciplines is recommended. Additionally, while an ethnically diverse sample from the United States was used in this study, assessing the psychometric properties of the APS-S on samples from other countries would also be beneficial. Furthermore, assessing the predictive validity of the APS-S on outcome measures such as academic performance, in comparison to other measures of procrastination, such as the Tuckman and PASS scales, is also recommended. Finally, employing the scale using the more traditional endpoints of strongly agree and strongly disagree (as opposed to "agree" and "disagree," as originally proposed) is also recommended. In fact, it would be interesting to see if any differences exist in the statistical properties of the scale (e.g., M, SD, reliability, validity, factor structure) when using these two types of descriptors as scale endpoints (e.g., strongly agree vs agree).

In terms of study limitations, while an ethnically diverse sample was used, it was one of convenience, which consisted of intact, self-selected participants from three different psychology courses at a single university in the Western United States. While one of the courses (introductory statistics) is a service course taken by students from various majors on campus, including, for example, psychology, biology, chemistry, and criminology (approximately 73% of students in this class were not psychology majors), the other two courses were predominantly taken by psychology students. While *post hoc* analyses comparing the introductory statistics class with the other two classes indicated highly similar estimates in the reliability and structural validity of the scale, nevertheless, because intact groups were used in the current study, with the sample consisting of a majority of psychology students, examining the validity of the APS-S using more heterogeneous samples is recommended.

Regarding the distributional characteristics of the APS-S, while the results indicated that the estimate of the skew was fairly low for the APS-S total score,

the estimate of kurtosis was somewhat elevated in the current sample ($z = -3.07$, $-.887/.289$). Generally speaking, regarding these two moments of the distribution, research tends to indicate that skew typically has the greatest overall effect on the accuracy of some of the more commonly used statistical procedures, such as tests on means (DeCarlo, 1997). Nevertheless, as kurtosis was somewhat elevated, researchers should exercise vigilance in continuing to observe the distributional characteristics of the scale in future work.

Finally, the current study found a significant difference between men and women on APS-S total scores, with men reporting significantly higher procrastination than women. Although they used a different measure of procrastination, this is consistent with the results of Brownlow and Reasinger (2000) and Steel and Ferrari (2013), who also found that males tended to report engaging in more procrastination than females.

While further investigation of the APS-S is warranted, the results of the current study indicated that the short form of the Academic Procrastination Scale possessed good estimates of reliability and validity on a sample of 282 students. Based on the results of the current work, the short form of the Academic Procrastination Scale may be a good option for researchers who are looking for a parsimonious measure of academic procrastination to include in their studies.

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Declaration of Conflicting Interests

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