Relative Contributions of Self-Efficacy, Self-Regulation, and Self-handicapping in Predicting
Student Procrastination

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Summary.—The relative contributions of self-efficacy, self-regulation, and self-handicapping on student procrastination were explored. College undergraduate participants ($N = 138$; 40 men, 97 women) filled out the Procrastination Scale, the Self-Handicapping Scale–Short Form (Strube, 1986), and the Self-Regulation and Self-Handicapping scales of the Motivated Strategies for Learning Questionnaire (Pintrich & De Groot, 1990). A hierarchical regression of the above measures indicated that self-efficacy, self-regulation, and self-handicapping all predicted scores on the Procrastination Scale, but self-regulation fully accounted for the predictive power of self-efficacy. The results suggested self-regulation and self-handicapping predict procrastination independently. These findings are discussed in relation to the literature on the concept of “self-efficacy for self-regulation” and its use in the field of procrastination research.

Within the study of procrastination, much attention has been paid to self-efficacy, self-regulation, and the related variable of self-handicapping. Klassen, Krawchuck, Lynch, and Rajani (2008) found a negative correlation between self-efficacy and academic procrastination. Klassen and Kuzucu (2009) also found a negative relationship between self-efficacy and academic procrastination, but only for girls in their sample of high school students. Seo (2008) found that self-efficacy plays a protective role against the effects of perfectionism on procrastination, with higher self-esteem leading to lower procrastination despite high perfectionism, which otherwise is associated with increased procrastination. In a meta-analysis, Steel (2007) found that self-efficacy shared a negative relationship with procrastination (average $r = -.38$). Similarly, in another meta-analysis, van Eerde (2003) found self-efficacy had a negative relationship to academic procrastination across studies (average $r = -.44$). Self-efficacy, it seems, is associated with lower procrastination.

Other research has focused exclusively on self-regulation. In one study, Senecal, Koestner, and Vallerand (1995) found that self-regulation alone could account for up to 25% of the variance in academic procrastination. Brownlow and Reasinger (2000) found that procrastination in their study was characterized by difficulty in self-regulation, and that those high in procrastination were most motivated by external regulation mechanisms. Ferrari (2001) found that those high in procrastination appeared to have difficulty in self-regulating their performance under time pressure, which he theorized led to dilatory behavior. In all of these cases, procrastination is associated with, and perhaps a result of, a lack of or failure in self-regulation.

Other researchers, however, have focused on a combined construct of “self-efficacy for self-regulation.” This concept is a combination of the two concepts by specifying self-efficacy in the domain of self-regulation, where the construct of interest is one’s self-efficacy beliefs regarding self-regulatory ability. Klassen, *et al.* (2008) found that lower self-efficacy for self-regulation is associated with higher procrastination. Klassen and Kuzucu (2009) found that, among a set of variables they investigated for high-school students including self-efficacy for self-regulation, self-esteem, and self-regulation by itself that self-efficacy for self-regulation was the strongest predictor of procrastination. Similarly, in a cross-cultural study, Klassen, Ang, Chong, Krawchuck, Huan, Wong, *et al.* (2010) found that self-efficacy for self-regulation was a strong predictor of procrastination in both Canadian and Singaporean students. However, outside of this

group of researchers, this concept has not become popular to date, although it may present practical and theoretical advantages to the separate measurement of self-efficacy and self-regulation as independent constructs.

A related construct in procrastination research is that of self-handicapping. Self-handicapping seems to be a more proximal variable to procrastination than self-regulation. In a study on examination performance, Beck, Koons, and Milgrim (2000) found that those high in self-handicapping were likely to study less and procrastinate more, leading to lower performance on examinations and lower overall course grades than those lower in self-handicapping. Self-handicapping is a result of a fear of failure rather than a simple failure to self-regulate, and Schraw, Wadkins, and Olafson (2007) suggest that fear of failure is a dominant theme in qualitative interviews among those high in procrastination. The prevalence of this theme in the ideas of those high in procrastination suggests that although potentially related, self-handicapping is a more proximal variable to procrastination than self-efficacy or self-regulation. Further, in meta-analyses Steel (2007) found self-handicapping predicted procrastination across studies (average $r = .46$), as did van Eerde (2009) in a similar meta-analysis (average $r = .45$).

The present study examined the relative contributions of self-efficacy, self-regulation, and self-handicapping in predicting academic procrastination. Hypotheses were that self-efficacy would significantly predict procrastination, and that self-regulation would fully account for the prediction of self-efficacy when regressed onto procrastination as a result of the emerging literature on “self-efficacy for self-regulation.” Finally, it was hypothesized that self-handicapping would account for some of the predictive power of self-regulation, but that the two would independently predict procrastination.

Method

Participants

Volunteer participants ($N = 138$; 40 men, 97 women) were recruited from undergraduate courses in the college of education at a large, Midwestern state university. Participants received extra credit in exchange for their participation. The age range of participants was 18 to 49 years ($M = 21.8$, $SD = 4.1$). In terms of college classification, five participants were freshman, 22 were sophomores, 56 were juniors, and 53 were seniors. In terms of ethnicity, 104 participants reported they were White, non-Hispanic, 13 that they were Black, non-Hispanic, 10 that they

were American Indian/Alaskan Native, eight reported Other, and one reported he/she was Asian/Pacific Islander. The mean grade point average for the sample was 3.18 ($SD = 0.41$). Two participants did not report any demographic information.

Materials

The materials consisted of a participant information sheet, the Procrastination Scale for Students (Lay, 1986), the Self-Handicapping Scale–Short Form (Strube, 1986), the Self-Regulation and Self-Handicapping subscales of the Motivated Strategies for Learning Questionnaire (Pintrich & De Groot, 1990), and a demographics questionnaire that asked for participants' sex, age, ethnicity, college classification, and current GPA. The Procrastination Scale for Students consists of 20 items, and demonstrated adequate reliability in the current sample (Cronbach's $\alpha = .87$). The Self-Handicapping Scale–Short Form consists of 10 items, and demonstrated modest reliability in the current sample (Cronbach's $\alpha = .71$), but in line with the reported reliability of the original validation study, with an alpha of .70 in the original sample (Strube, 1986). The Motivated Strategies for Learning Questionnaire Self-Efficacy and Self-Regulation subscales have previously been used separately from the entire scale (i.e., Howell & Watson, 2007; Klassen, *et al.*, 2008; Klassen & Kuzucu, 2009), so they were separated for the purpose of this study. The Self-Efficacy subscale consists of nine items and demonstrated adequate reliability in this sample (Cronbach's $\alpha = .88$). The Self-Regulation subscale also consists of nine items and had poor reliability in this sample (Cronbach's $\alpha = .58$), much lower than that reported in the author's validation sample ($\alpha = .74$; Pintrich & De Groot, 1990). The low reliability is like to attenuate the correlation coefficients, and to bias the nature of the multiple regression analysis toward smaller values, thus creating an overly conservative parameter estimate (c.f. Aitken & West, 1996; Pedhazur, 1997).

Procedure

Participants in face-to-face classes completed a paper survey, while participants in online classes were directed to an equivalent online survey. All surveys were self-administered and returned to the researchers at the completion of data collection. All participants were treated in compliance with American Psychological Association ethical guidelines, and these procedures were approved by the University Institutional Review Board.

Because participants were engaged in two distinct data collection methods, they were compared based on which collection method they participated in to assess equivalency of the

methods using a multivariate analysis of variance (MANOVA). Eighty-one participants took the surveys in person, and 53 participated online. The MANOVA for all of the surveyed variables with collection method as the independent variable was not statistically significant [Wilks' λ (3, 133) = 2.33, $p = .08$, $\eta^2 = 0.05$). This preliminary methodological analysis indicated that collection method did not affect the survey results, and provided justification for inclusion of both collection methods in the primary analyses. Using independent-samples T-tests, differences based on sex were assessed for all measures. No statistically significant differences on the basis of sex existed on any variable.

Results

To examine the relative contributions of self-efficacy, self-regulation, and self-handicapping in predicting procrastination, a hierarchical linear regression was used. Previous literature suggested that self-efficacy should be entered as the first step, then self-regulation as the second step, because self-regulation was hypothesized to play a mediating role in self-efficacy's effect on procrastination. Finally, self-handicapping was entered as the third step because it was hypothesized to be the most proximal variable to procrastination.

Self-efficacy was a significant predictor of procrastination in the first step, and explained a small portion of the variance in procrastination ($r^2 = .10$). In the second step, self-efficacy was no longer a significant predictor, but self-regulation was a significant predictor of procrastination, and the second step explained a moderate portion (Cohen, 1988) of the variance in procrastination ($r^2 = .20$). Finally, in the third step, self-efficacy was still not a significant predictor, but its predictive relationship diminished further, while self-regulation was still a significant predictor, but less strongly, and self-handicapping was a significant predictor of procrastination. In step three, a large portion (Cohen, 1988) of the variance was explained ($r^2 = .40$). The results are summarized in Table 2.

Discussion

All primary hypotheses were supported by the results of this study. Self-efficacy was a statistically significant predictor, but self-regulation fully accounted for the predictive power of self-efficacy. This supports the literature suggesting "self-efficacy for self-regulation" as a more valid approach in studying procrastination, as self-regulation appears to subsume self-efficacy in

predicting procrastination (Klassen, *et al.*, 2008, 2010). Further, self-handicapping and self-regulation appear to independently predict procrastination, although there is shared variance between these two variables. This suggests that although there may be some overlap between self-regulation and self-handicapping, they should be studied independently in regards to procrastination.

This study has several significant limitations. A larger sample size would allow more powerful statistical analyses to be used that could directly test for directionality, such as structural equation modeling. Although this study is suggestive of these effects based on the results of the hierarchical regression analysis, regression cannot directly test directionality, nor can the current design test for cause-effect relationships. Further, all participants were from a single college of education at a single university. Greater variability within the sample would be needed for more generalization to be possible. Future research should focus on methods that will allow for more generalization and a direct test of the mediation between these three variables.

Given these limitations, however, this study offers a contribution to the discussion on the role of self-efficacy, self-regulation, and the emergent research trend on “self-efficacy for self-regulation” by demonstrating the relationship between self-efficacy and self-regulation in predicting procrastination when measured separately. This relationship lends support to the idea of using measures of “self-efficacy for self-regulation,” though a more direct comparison is needed to confirm these findings. Further, these findings suggest that self-handicapping is still a significant contributing factor for additional research in the future, beyond self-efficacy, self-regulation, or their combined predictive power. Taken together, these findings offer insight for future research in the field of procrastination.

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TABLE 1
Means and Standard Deviations For Measures

	<i>M</i>	<i>SD</i>	<i>r</i>		
			2.	3.	4.
1. Procrastination Scale for Students	2.87	0.61	-.31	-.43	.54
2. Self-efficacy	4.21	0.59	—	.49	-.19
3. Self-regulation	3.56	0.53		—	-.31
4. Self-handicapping	2.65	0.62			—

TABLE 2
Regression Table For Hierarchical Regression Analysis

Step	Measure	B	SE B	β	95% CI β		<i>t</i>	<i>p</i>	r^2	r^2 Change
					Lower Bound	Upper Bound				
1	Self-efficacy	-.32	.09	-.31	-.49	-.15	-3.75	<.001	.10	
2	Self-efficacy	-.13	.09	-.13	-.31	.05	-1.41	.16	.20	.11
	Self-regulation	-.46	.11	-.38	-.64	-.23	-4.18	<.001		
3	Self-efficacy	-.06	.08	-.05	-.26	.06	-.68	.50	.40	.19
	Self-regulation	-.27	.10	-.23	-.47	-.10	-2.78	.01		
	Self-handicapping	.48	.07	.48	.34	.66	6.45	<.001		