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Academic Procrastinators and Their Self-Regulation[*]

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Previous procrastination research has provided considerable support for procrastination as a failure of self-regulation. However, procrastination has rarely been examined in relation to models of self-regulated learning. The purpose of this study was to understand the motives and reasons for academic procrastination from a self-regulated learning perspective. The current study employed a mixed-methods design in which participants completed several survey instruments of academic procrastination, self-regulation, and academic motivation and participated in semi-structured interviews. Findings indicated that academic procrastination was related to poor self-regulatory skills and defensive behaviors including self-handicapping strategies. Only limited support for students' demonstration of procrastination as an adaptive behavior (or, *active procrastination*) was also indicated. Limitations and implications for future research are discussed.

Keywords: Academic Procrastination; Self-Regulation; Active Procrastination; Self-Handicapping

Introduction

Procrastination has been commonly understood as a maladaptive behavior that impedes successful academic experiences. As conventional wisdom suggests, procrastination is linked with various adverse academic behaviors such as missing or late assignments, decreasing in task preparation time, and giving up studying (Lay & Schouwenburg, 1993; Tice & Baumeister, 1997; van Eerde, 2003). There are extensive empirical findings that support a highly negative relationship between procrastination and academic achievement (Beswick, Rothblum, & Mann, 1988; Tice & Baumeister, 1997; van Eerde, 2003; Wesley, 1994). Existing research has been conducted mostly within a view of procrastination as an irrational delay which involves an intention-action gap (Lay, 1994; Solomon & Rothblum, 1984; van Eerde, 2003; van Hooft, Born, Taris, van der Flier, & Blonk, 2005). That is, procrastinators needlessly postpone the implementation of planned tasks. Steel (2007), for example, defined procrastination as "voluntarily delaying an intended course of action despite expecting to be worse off for the delay (p. 66)".

Consistent with irrationality and intention-behavior discrepancy aspects of procrastinatory behavior, various studies imply that academic procrastination is closely related to a failure in self-regulation. Self-regulation refers to self-generated thoughts, feelings, and behaviors that are oriented to the attainment of personal goals (Zimmerman, 2000). Learners who are self-regulated are proactive in their learning. Self-regulated learners set their own goals and plan and use effective learning strategies. These learners monitor and evaluate their performance and adjust their strategies. They also display adaptive self-motivational beliefs such as high self-efficacy and mastery goal orientation (Pintrich, 2000). On the other hand, learners with poor self-regulation often fail to employ effective learning stra-

tegies and hold maladaptive motivational beliefs such as low self-efficacy and performance goal orientations. It is also reported that poor self-regulators frequently experience fear of failure and anxiety (Pintrich, 2000; Zimmerman, 2002). Such characteristics of poor self-regulated learners have been observed among academic procrastinators.

First, procrastinators seem to have a deficit in regulating their cognition. They do not use effective learning strategies and often lack metacognitive knowledge and skills (Howell & Watson, 2007; Wolters, 2003). McCown, Petzle, and Rupert (1987) reported that procrastinators underestimated the amount of time necessary to complete a task and failed to allot sufficient time. Procrastinators also performed less effectively under high cognitive work demands compared to low cognitive load conditions, suggesting deficits in selection of effective cognitive strategies (Ferrari, 2001). In addition to cognitive deficiency in self-regulation, procrastinators also demonstrate lack of behavioral regulation. For example, procrastinators have poor time management skills and engage in disorganization (Howell & Watson, 2007; Lay, 1986; Lay & Schouwenburg, 1993; Steel, 2007). This indicates that procrastinators have difficulties adopting or maintaining a systematic and structured approach to studying. In fact, many studies reported that procrastinators often fail to follow their intentions and plans (Howell, Watson, Powell, & Buro, 2006; Lay & Schouwenburg, 1993). Furthermore, procrastinators seem to have motivational problems with regard to self-regulation. For example, a number of studies indicated that procrastination is inversely related to academic self-efficacy (Ferrari, Parker, & Ware, 1992; Haycock, McCarthy, & Skay, 1998; Sirois, 2004; Steel, 2007; van Eerde, 2003). Others also found that procrastinators tend to adopt performance goal orientation, and experience higher levels of anxiety (Lay, 1994; Lay & Schouwenburg, 1993; Steel, 2007; van Eerde, 2003; Wolters, 2004). In summary, academic procrastinators appear to be low self-regulated learners.

Expanding a view of procrastination as self-regulation failure, some researchers further proposed a self-handicapping strategy as a major source of procrastination. That is, people may procrastinate in order to provide an alternative reason for expected failure, thereby protecting their self-worth (Covington, 1992; Rhodewalt & Vohs, 2005). Some studies indicated favorable results to this idea. For example, Ferrari and Tice (2000) reported that procrastinators tend to delay their work only when there was a threat of their low ability being revealed. Bui (2007) also found a similar result. Additionally, several studies found a significant positive relationship between avoidance goal orientation and procrastination (Howell & Watson, 2007; Seo, 2009; Wolters, 2004). Howell and Buro (2009), for example, reported a mediation effect of mastery-avoidance goal orientation on a positive relationship between an entity view of ability and procrastination, which implies a self-protection motive of procrastination. In fact, a strong correlation between procrastination and self-handicapping is commonly found in the literature (Ferrari, 1991; Steel, 2007; van Eerde, 2003).

However, debate remains as to whether procrastination is indeed a self-handicapping strategy. While a positive relationship between procrastination and fear of failure should be observed to regard procrastination as a self-handicapping strategy (i.e., people who easily experience fear of failure or anxiety may engage in procrastination so that they can avoid a situation in which an expected failure would be attributed to their personal ability), the literature does not consistently support that procrastinators experience fear of failure (e.g., Schouwenburg, 1995; van Eerde, 2003). Further, Lay, Knish, and Zanatta's (1992) study implied possible differences between self-handicapping and procrastination. According to their study, self-handicappers did engage in procrastinatory behavior in order to protect their self-worth just as they reduced their effort or practice time for the same purpose. However, procrastinators did not engage in self-handicapping behaviors other than procrastinatory behavior. The researchers concluded that procrastination may serve a different function from that of self-handicapping.

Although previous research suggests that procrastination is associated with a failure of self-regulation, only few studies (e.g., Howell & Watson, 2007; Wolters, 2003) examined procrastination explicitly in relation to models of self-regulation. One of the goals in the current study, therefore, is to provide additional findings on procrastination from a self-regulated learning perspective. For this purpose, we specifically adopted the model of self-regulation proposed by Pintrich (2000). We chose this particular model of self-regulation because it encompasses regulation in several different areas. According to Pintrich (2000), self-regulated learning includes regulation of learners' cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment. Cognition, motivation, and behavior represent different areas of regulation, and different phases or processes of self-regulated learning are involved within each area. As we discussed previously, procrastination is a complex phenomenon that relates to various aspects of human activity; thus, we considered such a comprehensive view of self-regulation (i.e., Pintrich's model) the most suitable conceptual approach for studying procrastination in this investigation. Further, although other models of self-regulation (e.g., Strack, 1999; Thayer & Lane, 2000; Vohs & Baumeister, 2004) may also inform procrastinating behaviors, our study focused primarily on academic procrastination and Pintrich's model is established within the academic self-regulation

research (e.g., Pintrich & de Groot, 1990; Schunk, 2005).

The study further explored other aspect of procrastination. In contrast to a conventional view of procrastination as detrimental, some researchers argue that procrastination can be beneficial. In Schraw, Wadkins, and Olafon's study (2007), college students reported two beneficial aspects of procrastination. One of them is cognitive efficiency. Students reported that working within a tightly controlled time led to concentrated effort and eliminated distractions. The second benefit of procrastination is peak experience; that is, working in short intervals enhances motivation, makes boring tasks more engaging and challenging, and leads to a sustained state of "flow." More interestingly, students in Schraw and colleagues' (2007) study reported that they planned to procrastinate for such adaptive reasons.

In fact, Chu & Choi (2005) suggested that procrastination could serve as self-regulatory processing. Chu and Choi found that some people purposefully choose to put off tasks because they believe procrastination contributes to their best performance. The study referred to such people who intentionally procrastinate for adaptive purposes as *active procrastinators*. According to Chu and Choi's study, active procrastinators used time more purposively, had greater perception of time control, showed higher self-efficacy, and used adaptive coping strategies (e.g. task-oriented strategies) when compared to *passive procrastinators*. Passive procrastinators are those who do not deliberately procrastinate but end up delaying tasks, feeling overwhelmed, and becoming pessimistic in their outlook as they approach the deadline. These researchers believe, not only unplanned delay, but also intentional delay should be considered as procrastination.

The presence of active procrastinators generates serious contradiction to previous research as active procrastination represents effective self-regulatory processing and does not involve an intention-action gap. In fact, researchers recently noted that procrastination must be distinguished from planned delay, acknowledging that planned delay is a wise strategy rather than irrational behavior (van Eerde, 2003; van Hooft et al., 2005). This issue of intentional, or purposeful, delay is currently on debate in the literature. The current study, therefore, was interested in examining students' perspective on intentional delay and active procrastination.

Accordingly, the current study addressed four research questions. First, what are the differences between high procrastinators and low procrastinators regarding learning processes in different components of self-regulation (e.g., cognition, motivation, and behavior)? Second, how does procrastination relate to a self-handicapping behavior? Third, how do students define procrastination? Do they consider intentional delay as procrastination? Lastly, do students purposefully "procrastinate" with intent to academically perform better? For a more comprehensive understanding of academic procrastination, this study employed a mixed methods approach. Most of the existing procrastination research heavily relies on outcomes from survey instruments. However, as existing research suggests, procrastination is an intra-individual process that may involve complex underlying motivations. Assessing procrastinatory behavior with survey instruments alone likely constrains the understanding of the complete nature of procrastination. Therefore, we conducted individual and focus group interviews to complement survey instruments that assess students' procrastination and other elements of academic behaviors. The resulting data from two different methods were triangulated allowing for in-depth

exploration of individual differences and intra-individual processes among procrastinators. **Table 1** illustrates the corresponding research methods selected to address the research questions.

Method

Participants

Participants in this study were 41 undergraduate students who were recruited from two sections of an introductory general education course at a large Mid-Atlantic university. They were typical college students whose ages ranged from 19 to 21. More than half of the students were in their freshman and sophomore years. About sixty percent of the participants were female. We targeted the general education course because students in this class represented various majors including elementary education, secondary education, communication disorders, special education, human development and family studies, kinesiology and rehabilitation services. Of the 41 students, 36 students participated in focus groups and 5 other participants were individually interviewed. Each focus group consisted of between 2 and 7 students. The size of these groups was determined by self-selected time slots. Students signed up for sessions that best fit their schedules. This strategy allowed for heterogeneity of groups and the size of the groups, while varied, provided opportunities for all to participate (Gay, Mills, & Airasian, 2009). All participants received extra credit points toward their course grade for participation in the study.

Measures and Materials

We used six survey instruments to collect quantitative data and a partially-structured interview protocol for additional, qualitative data.

The first instrument was the Generalized Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995). Self-efficacy is commonly regarded as domain-specific (Bandura, 2006; Pajares, 1996). The GSES, in contrast, was designed to assess a broad and global sense of personal confidence in one's coping ability across a wide range of demanding or novel situations (Schwarzer, Bäßler, Kwiatek, Schröder, & Zhang, 1997). As such, the purpose of the instrument is not to measure self-efficacy for an individual task. The scale is widely used and is reported to be reliable, homogeneous, and unidimensional across 25 nations (e.g., Canada, France, Korea, and India). Adequate internal consistency reliability for the English version of the GSES has also been reported, alpha = .87 (Scholz, Dona, Sud, & Schwarzer, 2002).

Table 1.
Relationship between research questions and research methods.

Research Questions	Surveys and other quantitative methods	Interviews
1. What are the differences between high procrastinators and low procrastinators regarding learning processes in different components of self-regulation?	x	x
2. How does procrastination relate to a self-handicapping behavior?	x	x
3. How do students define procrastination behavior?		x
4. Do students purposefully procrastinate with intent to academically perform better?	x	x

In addition to the GSES, students also completed the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1991). The MSLQ is the most used self-report instrument developed to evaluate college students' motivational orientations and their use of different learning strategies. The MSLQ comprises 15 subscales with a total of 81 items: Intrinsic goal orientation, Extrinsic goal orientation, Task value, Control of learning beliefs, Self-efficacy, Test anxiety, Rehearsal, Elaboration, Organization, Critical thinking, Metacognitive self-regulation, Time and study environment, Effort regulation, Peer learning, and Help seeking. These subscales are often administered as individual construct scales. Items in the scales asked students to respond corresponding to their behaviors in the specific class from which they were recruited. Students rated each item on a 7-point Likert scale, ranging from 1 = *Not at all true of me* to 7 = *Very true of me*. In previous research, Cronbach's alphas for the Motivational Scales ranged from .62 to .93 and for the Learning Strategies Scales from .52 to .80 (Pintrich et al., 1991). Pintrich et al. also reported that the MSLQ has moderate predictive validity and reasonable factor validity (p. 4).

The Procrastination Assessment Scale–Student (PASS; Solomon & Rothblum, 1994) was administered to assess students' tendency to procrastinate. PASS is developed consistent with the view of procrastination as an irrational, maladaptive delay (Solomon & Rothblum, 1984). The PASS consists of 44 items across two sections. The first part of the scale evaluates the prevalence of procrastination in six academic areas: writing a term paper, studying for an exam, keeping up with reading assignments, performing administrative tasks, attending meetings, and performing school activities in general. Howell, Watson, Powell, and Buro (2006) reported an alpha coefficient of .75 for the first part of the PASS.

The second half of the PASS presents a scenario of procrastination as writing a term paper and a list of 26 potential reasons for procrastination on the task (e.g., "You had a hard time knowing what to include and what not to include in your paper"). For each of the reasons, students were asked to indicate the extent to which it reflects why they procrastinated on a five-point scale. In this study, we computed, for each item, the percentage of participants who highly endorsed an item (i.e., marked 4 or 5) to examine which statements better represent students' reasons for procrastination.

Another instrument that administered was the Self-Handicapping Scale (SHS; Jones & Rhodewalt, 1982). Students rated each item on a 6-point Likert-scale ranging from 0 = *Disagree very much* to 5 = *Agree very much*. Example items include, "*I sometimes enjoy being mildly ill for a day or two because it takes off the pressure.*" and "*I admit that I am tempted to rationalize when I don't live up to other's expectations.*" A single item on the scale was omitted because it directly addressed procrastination (i.e., "I tend to put things off until the last moment"). As we used this scale to address self-handicapping as related to procrastination, we determined that inclusion of this item would inflate relations between procrastination and self-handicapping as measured by the SHS. Thus, we only used 24 items for data analysis and possible scores ranged from 0 to 120. Rhodewalt (1990) reported that the scale yielded acceptable internal consistency (Cornbach's alpha = .79) and stability (test-retest reliability = .74) when administered in large group-testing sessions.

The 33-item Self-Worth Protection Scale (SWPS; Thompson

& Dinnel, 2003) was also used to measure the degree to which students have tendencies to engage in defensive behaviors. According to self-worth theory, some students underachieve only when there is a threat that poor performance is expected to reveal low ability; but, they try their best when there is no such threat and poor performance can be attributed to a factor unrelated to ability (Covington, 1992). Students with such different performances under high-versus-low evaluative situations are referred to as self-worth protective, which the SWPS purports to identify (Thompson & Dinnel, 2003). Students indicated the degree to which they agreed with each statement in a 7-point Likert-scale. A typical item is "*I perform at my best when there is little risk of failure*." Thompson and Dinnel reported internal consistency of .89.

The final instrument used in this study was the Students' Test Anxiety Scale (STAS; Sperling, Rectenwald, Park, & Sloan, 2009). The STAS evaluates students' experience of stress about testing. The scale with a total of 28 items is divided into two parts. The first part is comprised of 2 items that assess students' perception of test anxiety in relation to performance (e.g., Test anxiety helps me to do better on exams). The remaining 26 items describe situational statements that may be related to test anxiety, and respondents rate the frequency of experiencing stress under each situation on a 5-point Likert-scale. Example items include, "*I feel stressed about how the test is going to affect my grade*" and "*I feel stressed when I have trouble on the first problem or item*". The scale was reported as reliable with Cronbach's alpha of .91 (Sperling, et al., 2009).

In addition to the six survey measures, an interview protocol was developed and refined based on data from a pilot study. The pilot study was conducted in one semester prior to the current study and tested an initial interview protocol. The interview protocol used in the pilot study derived from a literature review of motivation and self-regulation of procrastination. The initial protocol consisted of open-ended questions encompassing mainly three areas of interest: 1) definitional aspects of procrastination, 2) the trait/state nature of procrastination, and 3) the potential self-regulatory nature of procrastination. This pilot protocol examined procrastinatory behavior in a broader context including procrastination in daily life as well as academic settings. The questions, thus, were asked regarding students' procrastination behavior in different settings and characteristics of different conditions in which they have procrastinated. Sample questions include the following: "When do you usually procrastinate?", "What kinds of task do you usually procrastinate on?" and "Describe in detail a time you procrastinated on a task or an activity that was not directly related to school course work." Participants for the pilot study were recruited from the same courses as the current sample, but they did not overlap with those in the current study. The format and procedure of the interview were similar to ones in the current study. All interviews in the pilot study were audio-recorded and transcribed verbatim.

The data from the pilot study indicated that students demonstrated different procrastination tendencies in different contexts. Students did not report consistent procrastinatory behaviors between non-academic and academic settings. This directed the current study to be explicit about its focus on academic procrastination. Also, the pilot data suggested that students were more willing to provide detailed description of the behavior when they were prompted to share their experiences. Thus, the new interview protocol eliminated questions about procrastina-

tion in different settings and instead added more questions regarding students' motivations and cognitive processes while procrastinating on academic tasks. Above all, the new protocol narrowed the focus of the study to the regulatory or motivational nature of academic procrastination, which was the main purpose of the present study.

The interview protocol for the current study was partially-structured and was used primarily as a guide while the interviewer modified the protocol and added additional questions during the interview (Krathwohl, 1998). The interview questions were open-ended and designed to acquire in-depth descriptions of students' academic and procrastinating behaviors. The same protocol was used for both focus group and individual interview sessions. All of the interviewees were first asked to describe a recent time they had procrastinated on an academic task. This question was prepared to get participants involved in the topic as they explained their own experiences. The subsequent questions were developed to probe students' perceptions of and various potential reasons for academic procrastination. Sample questions were, "*How much did you care about the outcome or performance of your work (that you procrastinated on)?*" and "*Why do you think you procrastinated on this task?*"

Procedure

On the recruitment day, the researcher visited each class and explained briefly to students the purpose and procedures of the study. Students who wished to participate in the study voluntarily signed up for one of the interview sessions that included focus group sessions and individual interview sessions. Focus group interviews were designed as a mechanism to encourage students to share their experiences and opinions about academic procrastination and respond to each other thereby generating a richer dataset regarding procrastination tendencies (Krueger, 1994). After signing up, students received a packet that contained the six self-report questionnaires and a consent form. They were asked to complete the packet at home and to bring it back on the interview day. The six questionnaires include a total of 222 items and it took approximately 45 minutes - 60 minutes for students to complete. All students who came to the interview sessions turned in the packet.

The interviews were conducted in a small-sized classroom. Upon arrival, the survey packet and the consent document were collected and the purposes of the study and the interview format were briefly explained. In the consent document, students were notified that they were free to end their participation at any time or to decline to answer any questions without penalty. To assure accurate data recording, students were asked to use numbers, which were designated on their survey packet, and to refer to their number whenever they made comments during the interview. All interview sessions were audio-recorded. Each interview lasted approximately 40 minutes and all sessions were completed within 2 weeks.

Results

Results from Analyses of the Survey Data

The survey data were analyzed to examine differences between high and low procrastinators with respect to their self-regulation and motivation in academic settings. The sum scores of each scale were used for data analyses. Descriptive statistics and reliability coefficients for all scales are presented in **Table 2**.

Table 2.
Descriptive statistics for all variables.

Variable	M	SD	α
PASS (12[a])	33.85	7.25	.86
Self-Handicapping (24)	57.52	13.47	.77
STAS (28)	90.19	17.36	.91
Self-Worth Protective (33)	74.78	12.49	.80
Gen. Self-Efficacy (10)	31.34	4.55	.89
MSLQ			
Intrinsic goal (4)	18.27	3.44	.64
Extrinsic goal (4)	21.29	3.60	.48
Task value (6)	32.28	4.97	.81
Cont. learning beliefs (4)	23.05	3.13	.60
Self-efficacy (8)	45.62	6.41	.93
Test anxiety (5)	19.16	6.06	.91
Rehearsal (4)	20.05	4.63	.74
Elaboration (6)	28.40	5.79	.75
Organization (4)	16.66	4.43	.51
Critical thinking (5)	19.18	5.28	.79
Meta. self-regulation (12)	54.30	10.61	.81
Time and study mgmt. (8)	41.04	8.39	.84
Effort regulation (4)	20.96	3.81	.71
Peer learning (3)	8.33	3.58	.61
Help seeking (4)	12.63	4.92	.70

[a]The number in parenthesis indicates the number of items in the scales.

Table 3.
Results of the analysis of group comparison.

	M_H^a (SD)	M_L^b (SD)	t (df = 39)	p	Cohen's d
SHS	61.50 (10.62)	46.37 (9.88)	–4.697	<.000	1.475
STAS	90.09 (13.21)	78.58 (19.15)	–2.334	.025	.699
SWPS	141.81 (23.18)	125.10 (19.94)	–2.453	.019	.773
GSES	30.18 (5.01)	32.68 (3.62)	1.806	.079	.572
MSLQ					
Intrinsic goal	17.82 (4.04)	18.79 (2.59)	.899	.374	.285
Extrinsic goal	21.68 (3.76)	20.84 (3.45)	–.740	.463	.232
Task value	31.91 (5.07)	32.71 (4.96)	.510	.613	.159
Con. learn. beliefs	22.82 (3.20)	23.32 (3.11)	.503	.618	.158
Self-efficacy	44.14 (7.06)	47.34 (5.23)	1.628	.112	.515
Test anxiety	21.32 (4.69)	16.66 (6.61)	–2.628	.012	.813
Rehearsal	18.50 (4.36)	21.84 (4.37)	2.443	.019	.765
Elaboration	28.55 (5.00)	28.23 (6.73)	–.168	.867	.054
Organization	16.59 (4.52)	16.74 (4.45)	.104	.918	.033
Critical thinking	19.09 (5.73)	19.29 (4.85)	.119	.906	.037
Meta. self-reg.	51.64 (10.68)	57.39 (9.91)	1.780	.083	.558
Time and study mgmt.	38.55 (8.90)	43.92 (6.89)	2.135	.039	.674
Effort regulation	19.09 (3.50)	23.13 (2.93)	3.966	<.000	1.25
Peer learning	8.23 (3.46)	8.45 (3.80)	.194	.847	.060
Help seeking	12.73 (4.32)	12.53 (5.65)	–.129	.898	.039

[a]MH indicates mean scores of the high procrastinator group. [b]ML indicates mean scores of the low procrastinator group.

Participants were classified as either high or low procrastinators through a median split procedure. Participants whose PASS score was greater than or equal to 33 (M = 38.55, SD = 6.38, n = 22) were classified as high procrastinators. Low procrastinators were those whose PASS score was less than 33 (M = 28.42, SD = 3.37, n =19). Mean scores of two groups in each scale were compared to examine group differences in cognitive, metacognitive, and motivational processes in academic performance. **Table 3** shows the results of independent sample t tests on each scale.

The results were similar to findings reported in previous research (e.g., Howell & Watson, 2007; Steele, 2007; Wolters, 2003). First, high procrastinators displayed a significantly higher tendency to self-handicap (t = –4.697, df = 39, p < .001) and to protect their self-worth (t = –2.453, df = 39, p = .019) when compared with low procrastinators. High procrastinators also reported significantly higher test anxiety on both STAS (t = –2.334, df = 39, p = .025) and MSLQ (t = –2.628, df = 39, p = .012) than low procrastinators. In addition, less reported use of learning and regulatory strategies was observed among high procrastinators including rehearsal (t = 2.443, df = 39, p = .019), time and study environment management (t = 2.135, df = 39, p = .039), and effort regulation (t = 3.966, df = 39, p < .001). There was no significant difference in self-efficacy beliefs between the two groups.

Table 4 further reports the correlations among the examined variables. The result was consistent with findings from the independent t tests. First, procrastination scores (i.e., PASS scores) had positive relationships with self-handicapping scores

Table 4.
Pearson correlations among variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. PASS	-	.62**	.29	.33*	−.42**	−.35*	.13	−.25	.07	−.14	.26	−.32*	−.03	−.02	−.20	−.33*	−.48**	−.62**	−.03	−.08
2. Self-Handicapping		-	.40**	.42**	−.44**	−.41**	.16	−.14	.17	−.17	.42**	−.50**	−.01	−.09	−.05	−.26	−.56**	−.57**	−.19	−.03
3. Test Anxiety Measure			-	.41**	−.17	−.05	.35*	.15	.17	−.14	.54**	.04	.13	.13	.21	.04	−.02	.08	.08	.14
4. Self-Worth Protection				-	−.33*	−.16	.56*	.07	.24	−.04	.50**	.01	−.08	.12	.09	−.14	−.09	−.09	−.10	.12
5. Gen. Self-Efficacy					-	.55**	.08	.14	.13	.37*	−.11	.23	.08	.06	.29	.29	.37*	.20	.09	.07
MSLQ																				
6. Intrinsic goal						-	.11	.42**	.06	.17	.08	.29	.30	.32*	.33*	.42**	.38*	.32*	.27	.04
7. Extrinsic goal							-	.24	.39*	.23	.32*	.25	.10	.24	.26	.09	.20	.13	.18	.18
8. Task value								-	.17	.15	.16	.35*	.61**	.18	.49**	.57**	.46**	.39*	.25	.26
9. Cont. learn. beliefs									-	.51**	.19	.16	.01	.06	.19	.07	−.05	.13	−.19	−.31*
10. Self-efficacy										-	−.12	.30	.19	.17	.07	.13	.36*	.26	−.17	−.40**
11. Test anxiety											-	.04	−.03	.18	.12	.02	−.08	−.07	−.05	.08
12. Rehearsal												-	.23	.32*	.23	.51**	.69**	.59**	.46**	.30
13. Elaboration													-	.38*	.48**	.63**	.37*	.23	.39*	.25
14. Organization														-	.07	.47**	.27	.26	.26	.00
15. Critical thinking															-	.53**	.25	.09	.27	.18
16. Metacog. self-regul.																-	.62**	.45**	.56**	.36*
17. Time and study mgmt.																	-	.72**	.36*	.27
18. Effort reg.																		-	.22	.12
19. Peer learning																			-	.66**
20. Help seeking																				-

*p < .05. **p < .01.

(p < .001) and self-worth protection scores (p < .05). PASS scores were also negatively associated with metacognitive strategies (p < .05) and some of the behavioral regulatory strategies includeing time and study environment management (p < .01) and effort regulation (p < .001). Different from the result of the group comparison analysis, procrastination was not associated with either the STAS or the MSLQ test anxiety scale. However, one of the PASS subscales measuring procrastination in studying for exams was positively correlated with scores on STAS (r = .33, p < .05). Scores on PASS correlated negatively with GSES scores (p < .01) but not with scores on the MSLQ

self-efficacy scale. Additionally, intrinsic goal orientation was inversely related to PASS scores (p < .05). On the other hand, procrastination scores did not correlate with extrinsic goal orientation.

In addition to the correlational analyses with the entire sample, separate interrelationships among the variables were calculated for each group. The most remarkable difference between the two groups was that the high procrastinator group showed a significant relationship between procrastination and self–handicapping (r = .55, p < .01). For the low procrastinator group, procrastination did not correlate with any other variables in the

study. For the high procrastinator group, PASS was negatively related to intrinsic value ($r = -.46$, $p < .05$), effort regulation ($r = -.55$, $p < .01$), and time and study environment management ($r = -.44$, $p < .05$). In addition, self-handicapping had a negative relationship with self-efficacy ($r = -.48$, $p < .05$), which was not observed with the low procrastinators. However, high procrastinators did not show any relationship between test anxiety and self-handicapping whereas such relationships were found among low procrastinators with both of the test anxiety scales (STAS: $r = -.64$, $p < .01$, MSLQ: $r = -.46$, $p < .05$). Another distinct difference between the two groups was also indicated in the relationship between self-handicapping and learning strategies. For high procrastinators, self-handicapping was negatively correlated with learning strategies; whereas, low procrastinators showed rather a positive relationship. A similar finding was reported with the interrelations between self-handicapping and task value: High procrastinators demonstrated a negative relationship whereas low procrastinators displayed a positive relationship.

Additionally, we examined students' endorsement of reasons for procrastination with the data from the second part of PASS. We constructed frequency tables (see **Table 5**) for each item, including the percentage of participants who highly endorsed each item. Overall, a relatively higher rate of endorsement was found with high procrastinators on every item compared to low procrastinators. This implies that high procrastinators do indeed engage more frequently in procrastination behavior than do low procrastinators.

Table 5.
The percentage of high and low procrastinators who highly endorsed each item of PASS.

Variable	M	SD	α
PASS (12[a])	33.85	7.25	.86
Self-Handicapping (24)	57.52	13.47	.77
STAS (28)	90.19	17.36	.91
Self-Worth Protective (33)	74.78	12.49	.80
Gen. Self-Efficacy (10)	31.34	4.55	.89
MSLQ			
Intrinsic goal (4)	18.27	3.44	.64
Extrinsic goal (4)	21.29	3.60	.48
Task value (6)	32.28	4.97	.81
Cont. learning beliefs (4)	23.05	3.13	.60
Self-efficacy (8)	45.62	6.41	.93
Test anxiety (5)	19.16	6.06	.91
Rehearsal (4)	20.05	4.63	.74
Elaboration (6)	28.40	5.79	.75
Organization (4)	16.66	4.43	.51
Critical thinking (5)	19.18	5.28	.79
Meta. self-regulation (12)	54.30	10.61	.81
Time and study mgmt. (8)	41.04	8.39	.84
Effort regulation (4)	20.96	3.81	.71
Peer learning (3)	8.33	3.58	.61
Help seeking (4)	12.63	4.92	.70

[a]The number in parenthesis indicates the number of items in the scales.

Specifically, more than 85% of high procrastinators highly endorsed the item, "You had too many other things to do," while 47% of low procrastinators endorsed the same item. Also, the item, "You felt overwhelmed by the task," was endorsed by 68% of high procrastinators compared with 42% of low procrastinators. These two items represent difficulties in managing time. In addition, high procrastinators had a stronger tendency to report laziness (i.e., "You just felt too lazy to write a term paper") and lack of energy (i.e., "You didn't have enough energy to begin the task") as a reason for procrastination than low procrastinators. Similarly, high procrastinators seemed to have low tolerance as 41% of them highly endorsed an item, "You felt it just takes too long to write a term paper," as compared with 10.5% of low procrastinators who highly endorsed the item.

Results from Analyses of the Student Interview Data

The interview data focused on exploration of underling motivational and cognitive processes of high and low procrastinators in depth. We first checked whether students classified as high or low procrastinators viewed themselves as procrastinators. Interestingly, while most high procrastinator acknowledged themselves as procrastinators, some of the low procrastinators classified by the survey data considered themselves as procrastinators. In the following section, high procrastinators referred to those who regarded themselves as procrastinators ($n = 28$) and low procrastinators are those who did not ($n = 13$) in the interviews. The interviews were transcribed verbatim and were analyzed focusing on students' motivational and regulatory behaviors under academic settings. Themes were developed from these data using a memoing and coding process. The two authors consulted in an iterative process to derive the codes. The first author read the transcript and categorized statements into different codes. The second author then reviewed the coding categories with the transcript. With the codes on which there was no consensus, the two authors discussed their perspectives and concerns. Multiple readings of the transcript were completed for the coding categories to be further refined and accurately reflective of participants' descriptions. This iterative peer review process was necessary to strengthen credibility and validity of the research (Creswell & Plano-Clark, 2007; Gay, Mills, & Airasian, 2009).

Four themes emerged from the interview data. These themes include a *lack of regulatory skills*, *working under pressure*, *defensive behaviors*, and *active procrastination*. Each of the themes is explained below in greater detail.

A Lack of Regulatory Skills

High procrastinators frequently mentioned that they were lazy. They noted that they were not good at following their plans and intentions. High procrastinators responded that they usually planned to work in advance but ended up doing their work at the last minute. They appeared to get easily distracted by other interesting activities and could not get themselves motivated to work as they had planned. Of the 28 high procrastinators interviewed, 27 acknowledged that procrastination is not a good behavior and showed an intention to decrease procrastination because they believed that they would perform better without procrastination. However, they seemed to continue to procrastinate. Six high procrastinators even believed

that they could not change their procrastinating behavior, reflecting an external locus of control. The following extracts demonstrate lack of regulation of behavior:

"I am also distracted with my roommates. And that is another reason why I delay doing work. There is always other stuff to do that is much more fun."

"Every time this happens to me, I say 'Next time, I need to change my habits.' And then it comes around to me actually doing it, I still always put it off."

"But I don't think that you can actually change. It is really difficult too, because every single year, I am just like, okay this year, I am going to do everything ahead, but it never happens."

On the other hand, low procrastinators seemed to schedule their work ahead of time taking into account other activities that they would have to be involved in. Low procrastinators ensured that they had enough time to complete a task and to carry out their schedule as planned. Low procrastinators, in general, reflected good self-management of their behavior in the face of distractions and a high commitment to accomplishing their goals.

Working under Pressure

In addition to differences in their regulatory behaviors, high and low procrastinators showed different attitudes or feelings about working under pressure. Of the 13 low procrastinators, 10 reported that they get stressed out when working under pressure, which is why they like to plan out ahead of time and work on an academic task in advance. However, 21 high procrastinators reported that they either work better under pressure or feel confident working under pressure. They indicated that they can stay focused on a task better when there is only limited amount of time to complete the task and that otherwise they would get easily distracted.

Although the students reported such benefits of procrastination, they did not necessarily seem to indicate that they performed better after procrastination. Rather, procrastinators acknowledged that they would do better quality work if they would not procrastinate. Twenty-seven high procrastinators denied that they procrastinate intentionally to work best under pressure, and 4 of them also mentioned that they just got used to working within a short period of time after a number of instances of procrastination and thus felt comfortable working under pressure. Students still reported experiencing stress or guilt during procrastination and regarded procrastination as a bad habit. Some example extracts are:

"Yes. I think I am a procrastinator. But it works out because I do some of my best work when I procrastinate."

"I think I work a little bit better when there is more of a time limit. …… I obviously try to work faster. No breaks. Get right [done]. …. I would not say I necessarily perform better. If I get myself focused earlier, then I would learn just as much as…"

Interestingly, one student pointed out that she or other people talk about working best under pressure only to justify procrastination. She articulated, "I can pretend as if I procrastinate because I work better under pressure. … It motivates me to get everything done. ... But, maybe, I am just trying to justify why I procrastinate. Trying to look better." She also said, "I don't think there is a benefit to procrastinate. I think that people just use procrastination as an excuse to say doing better under pressure."

Defensive Behavior

As the student's comment on justifying procrastination implies, high procrastinators seemed to engage in defensive, or self-protective, behavior. Another example of defensive behavior is provided by one of the focus group members who identified himself as a big procrastinator. He admitted that he set low academic standards. Setting a low goal represents efforts to protect self-esteem from failing to achieve a higher goal. Admitting a low academic standard itself could also be another justification of procrastination. He said, "To me, if you pass the class, you kind of passed it and I am happy with it. I was capable of passing it and that was what I was looking for. So I achieved my goal." Interestingly, he added that he would not recommend procrastination to those who want to strive to achieve as best as they can.

In relation to such defensive behaviors, some comments of high procrastinators implied a self-handicapping strategy. For example, one student, when asked how much she cared about performance on a task she had procrastinated, commented, "I actually care a lot about school work. That's why I am a procrastinator." This comment suggests that she kept delaying school work as she was afraid of failure. In addition, another student who said earlier that he set a low academic standard tended to attribute his poor performance to procrastination. He repeated that he did have the capability for better performance if he had not procrastinated. His remarks implied that procrastination was the only impediment to successful achievement. As he clarified:

"When I see my results, I get mad at myself, because I knew it was a work that I was capable of doing and it was not overwhelming. I would have received a better grade … So I do look at that as slightly more motivation to do better next time because it gives me competence knowing that I am capable of doing this work: it wasn't an exam I would have failed if I did try. It allows me to know that I am capable of doing the coursework and just makes me realize that I need to spend a little bit of more time next time."

Active Procrastination

While most high procrastinators reported that they did not intentionally procrastinate, there was one student who claimed procrastinating on purpose, reflecting active procrastination. Whereas other procrastinators, according to her, usually say, "I have to do this but …," she rather chose to put things off and do them at the last minute. She reported that she likes doing work at the last minute and being under pressure. Similar to other high procrastinators, she reported that she works better under pressure. However, unlike other procrastinators, she said to procrastinate intentionally so that she can focus and concentrate better on a task within a limited amount of time. She expressed strong confidence in working under pressure. She did not appear to feel anxious while procrastinating. She said it was because she knew that she can get it done on time. She had never regretted procrastinating because she always ensured that she had enough time to get things done, and she always received satisfying results. She seemed to demonstrate a tendency to work earlier on important tasks (e.g., assignments or tests in her major classes) when compared with ones that she thought of as less worthy for her success in life (e.g., tasks in her general education courses). The following extracts are from her responses during the interview:

"I actually like doing things in the last minute. I do it on purpose because I usually focus more on a task and I think that I think better because since I do have a time limit … I like to be

under the pressure because I think better … I'd rather have a time limit because then I focus more. If I study two or three days before, I will study one section I will go and eat I go focus on something else. But when I do have a time limit, I am devoted to that particular task … because I know myself I am the type of student no matter what, I will get things done despite when I do it or how I do it, I know I will get things done."

Discussion

The purpose of the current study was to understand the nature of academic procrastination in relation to self-regulation. Specifically, the study focused on examining the underling motives for academic procrastination from a self-regulated learning perspective. The study employed a mixed methods approach using the existing surveys and interviews. Overall, the results indicated that high procrastinators demonstrated a lack of self-regulation across the three areas of regulation, cognition, motivation, and behavior proposed in the Pintrich's (2000) model of self-regulation. This is consistent with the results reported in several recent studies that a low self-efficacy for self-regulation was the strongest predictor of a procrastination tendency (Klassen, Krawchuk, Lynch, & Rajani, 2008; Klassen, Krawchuk, & Rajani, 2008; Klassen, et al., 2010). The study also indicated evidence for self-handicapping aspects of procrastination.

First, procrastination represented failure in regulating their behavior. Most procrastinators did not plan to procrastinate, but tended to put off what they had planned and chose to engage in other events. During the interview, many procrastinators indicated that they happened to be involved in procrastination. One student reported, for example, "*I never plan to put stuff off, but it always just happens. Like I will do it a week in advance, but I never do. It just ends up*." Interestingly, most procrastinators still recognized the viciousness of procrastination. Similar to the interview data, both the group comparison and correlation analyses indicated that high procrastinators were less able to control their own efforts and to manage study time and environment than low procrastinators. Further, most of the high procrastinators highly endorsed a lack of time management, laziness, lack of energy, and low tolerance as reasons for procrastination. These findings certainly reflect an intention-action gap (van Hooft et al., 2005), poor inhibition (Baumeister & Vohs, 2004), or low volition (Keller, 2010). That is, procrastinators seem to have a deficit in enacting their intentions as reported in the recent study by Owens, Bowman, and Dill (2008).

Procrastinators also seem to lack regulation of cognition and motivation. High procrastinators were less likely to report use of cognitive and metacognitive learning strategies than low procrastinators. Low procrastinators especially demonstrated capability of planning, monitoring and evaluating their work. For example, one student who regarded herself as a non-pro- crastinator, reported that she designated time for each of her classes in the beginning of the semester. If she did not find any task to do for the designated time, she used it for another class. She seemed to plan all the time of her days and kept good track of her schedule. Further, there was some, but limited, evidence that procrastinators hold maladaptive motivational beliefs. For example, procrastinators were more likely to hold a low intrinsic value of task and low self-efficacy. In the group comparison analysis, high procrastinators demonstrated higher test anxiety on both of the measures (i.e., STAS and MSLQ) when com-

pared with low procrastinators. However, we did not find a linear relationship between test anxiety and procrastination.

Additional evidence for lack of self-regulatory skills of procrastinators was further provided with the separate correlation analyses. While the low procrastinator group did not find any significant relationship between procrastination and other variables, high procrastinators demonstrated a negative relationship between procrastination and three motivational and regulatory variables: intrinsic value, effort regulation, and time and study environment management.

However, the apparent lack of self-regulation among procrastinators could be attributable to a self-protective or defensive strategy. First of all, high procrastinators were significantly higher on self-worth protective scores than low procrastinators. As seen in past research, we found a strong positive correlation between procrastination and self-handicapping as well. This relationship was observed especially with high procrastinators. Low procrastinators in fact did not show any significant relationship between procrastination and self-handicapping. This result implies that high procrastinators are likely to engage in procrastination as a means of self-handicapping.

During the interviews, students with a higher procrastination tendency also reported engagement in several defensive behaviors. For example, one student during the interview kept asserting that he was competent enough to perform better had he not procrastinated. That is, he attributed his unsuccessful achievement to his procrastination, protecting beliefs about his competency. He also appeared to engage in other defensive or protective behaviors including setting low academic goals. In addition, many procrastinators reported they worked better under pressure even though they acknowledged a negative impact of procrastination on their academic achievement. Such a report is somewhat contradictory. As one student admitted, this may indicate that procrastinators defend their procrastinatory behavior by pretending to work better under pressure.

Procrastinators' higher test anxiety provides additional support for procrastination as a self-handicapping strategy. That is, as previously discussed, people who experience greater anxiety (or fear of failure) are more likely to attempt to avoid the situations in which their ability would be attributed to failure by self-handicapping. In this case, self-handicapping behavior takes a form of procrastination. In other words, self-handicapping, or procrastination, is a coping, albeit defensive, strategy for students who frequently suffer fear of failure. One interviewee in this study indeed hinted that she procrastinated because of fear of failure. In short, our findings suggest that procrastinators may be concerned with protecting their self-worth and thus their procrastinating behavior is likely used for defensive, self-handicapping, purposes.

However, it is still unclear to conclude that procrastination itself is a self-handicapping technique as suggested in previous studies (Ferrari & Tice, 2000; Senecal et al., 1997). The findings still indicated possible alternative motives for students' academic procrastination. Work avoidance goal orientation could be one of them. Five high procrastinators did not like to engage in any burdensome work and tended to work first on easier and more interesting tasks. They are more concerned with getting work done than doing a quality job. For example, one student who was identified as a high procrastinator reported during the interview, "… I don't really care how late I do it as long as it is on time … (after) I get done, then I don't care." He also commented that he put off studying Chemistry because Chemistry

is boring and requires a lot of complex work. Thus, as Lay et al. (1992) suggested, some people may engage in procrastination simply to avoid a task deemed aversive. It is also possible that procrastination represents simple avoidance of pressure and anxiety that is associated with aversive tasks (Thompson & Dinnel, 2007). Similar to this view, although not addressed in this study, mastery avoidance goal is suggested as one possible antecedent of procrastination in several studies as well (Howell & Buro, 2009; Seo, 2009).

According to the interview data, 21 high procrastinators reported that they work better under pressure. They said that they stay on task and focus better as well as get themselves more motivated to complete the task when there is only a limited amount of time before a due date. These comments represent beneficial aspects of procrastination that were identified in Schraw et al.'s (2007) study (i.e., cognitive efficiency and peak experience). In contrast to Schraw and et al.'s findings, with the exception of one of the high procrastinators in the current study, none of the subjects reported that they plan to (or intentionally) procrastinate for such benefits. These comments indicate that they are not active procrastinators. If they were active procrastinators who are successful self-regulators, they should have demonstrated strong competence for achieving academic success after procrastinating. However, high procrastinators rather admitted that they would have achieved better if they have spent more time on the task. For the current participants, working better under pressure did not necessarily mean better performance, but rather referred to enhanced concentration. In other words, after a considerable period of delay, procrastinators had to get themselves to stay on a task to complete it on time. Students may perceive such experience as a benefit of procrastination. They may even come to believe that they work better under pressure after a number of instances of procrastination. Or, procrastinators may pretend to work better under pressure in order to justify their 'undesirable' behavior. Overall, it seems that 'working better under pressure' as reported by procrastinators in this current study was somewhat different from what was found in the previous studies. The claimed benefits of procrastination by procrastinators in our study signified the consequences of procrastination, instead of the motives for procrastination.

Contrary to a majority of procrastinators, there was one student who reported that she deliberately chose to procrastinate to work under pressure. She exhibited characteristics of active procrastinators as described by Chu and Choi (2005). Like other high procrastinators, she reported she concentrated better on a task when under a limited amount of times. Unlike other procrastinators, she did not view her procrastination as a bad habit but rather as a purposeful strategy to work more efficiently. She described procrastination as part of prioritizing process. She appeared to have good control and use of time and enjoy working under pressure. She expressed strong motivation and confidence with last-minute tasks. She did not report any negative affection such as anxiety or guilt for procrastinating. With regard to the first research question, this student did consider herself a procrastinator whereas the other students did not perceive intentional delay as procrastination.

However, when her reports in the survey instruments were reviewed, the trend of her data appeared much like those of typical procrastinators. In fact, she was classified as a high procrastinator based on PASS, which defined procrastination as an irrational delay. PASS score was obtained based on the degree

to which they procrastinate on the task as well as the degree to which procrastination on the task is problematic for them. Thus, as regards dissimilar characteristics, active procrastinators should score lower on PASS. This was not observed with our student who claimed purposeful procrastination. This casts doubt on reliability of the student's report during the interview. It might be possible that she exhibited a stronger form of defensive, or self-protective, behavior that was observed among other procrastinators. Therefore, it is unclear whether students procrastinate as a regulatory strategy for effective performance.

Several limitations are noteworthy in examining the results of the study. First, the small number of students participated in this study. As the focus of the study was in-depth understanding of the nature of academic procrastination, the mixed-methods were used and the number of participants, hence, was constrained. The small sample size kept us from conducting more sophisticated statistical analysis and generalizing the results. Morever, the small sample may not have been sufficient to adequately identify various motivational aspects of procrastination. This may be one reason why the study found only few active procrastinators. Second, the study used self-report data. Although the current study collected two different types of data (e.g., survey and interview), both were still obtained from participants' own accounts. As procrastination is especially related to defensive behaviors, the students may not have provided accurate data. The third limitation lies in lack of domain-context specificity. Students may engage in different motivational and behavioral patterns across varying academic domains. The current study, however, measured students' self-regulation and procrastination in a general, broad academic context. It would yield more reliable data if participants are asked to report their behavioral tendencies in a specific context. The last limitation is related to the observed discrepancy between the survey data and the interview data in identifying the high vs. low procrastinators. This disparity may have restricted the interpretation of our findings. However, it should be noted that we used the median split procedure with the survey data as a way to examine any relative differences in motivational and regulatory behaviors between students with high and low procrastination tendencies. It was not our intention to accurately identify those who were serious procrastinators. On the other hand, in the interview, the students were asked to identify themselves as either procrastinators or non-procrastinators. Even if a student was classified as a low procrastinator based on the survey data, he or she may have still regarded himself or herself as a procrastinator. Thus, inconsistency between the survey data and the interview data with regard to identification of procrastinators should be expected.

In future research, it is recommended to examine procrastination differentiating those who plan to procrastinate and those who do not. From our data, it was found that students perceived themselves as procrastinators regardless of whether they had planned to procrastinate or not. However, each of them may represent two distinct groups engaging in different motivations. Examination of procrastination without distinction between these two types of delay, especially when the survey instrument is used, would confound results and in turn fail to capture varying motivations for procrastination. Future work, thus, should not only determine whether planned delay is considered as procrastination but also should examine separately two different delays.

Further exploration regarding the benefits of procrastination

is also necessary. Most procrastinators in the current study reported to work better under pressure; nevertheless, they did not seem to procrastinate for such benefits nor to achieve satisfactory results. This finding is different from what was observed by Schraw and his colleagues (2007) where procrastinators reported that they procrastinated for adaptive reasons and demonstrated a high level of satisfaction and achievement. One possibility for the varying finding may be different samples. Participants in Schraw and others' study were successful procrastinators who reported to plan to procrastinate, whereas most students in the current study did not procrastinate intentionally. This again points out the importance of distinction between planned and unplanned procrastination. In addition, while claiming benefits of procrastination, procrastinators in the current study still acknowledged the advantages of working in advance over that of working at the last minute. This is somewhat contradictory. Additional research is needed to further explore whether procrastination can be truly beneficial to students' learning.

In conclusion, the present study indicated that students may engage in academic procrastination for various reasons. Some students procrastinate as they fail to self-regulate their own learning. They demonstrated the similar motivational and behavioral patterns of those who are not self-regulated. In addition, defensive, or self-handicapping motivation for procrastination was reported. The adaptive function of procrastination was also noted; however, further studies are necessary. Finally the current study contributed to in-depth examination of students' own perception on academic procrastination. Future research should uncover the multiple reasons for academic procrastination and study which reasons correlate to procrastination under different learning circumstances. This work will enable the development of a process model or a theory of academic procrastination. Additional research, must too, include measures of observed behavior and assess the degree to which students can adequately report their procrastination tendencies.

REFERENCES

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Charlotte, NC: Information Age Publishing.

Baumeister, R. F., & Vohs, K. D. (2004). *Handbook of self-regulation: Research, theory, and applications*. New York, NY: The Guilford Press.

Beswick, G., Rothblum, E. D., & Mann, L. (1988). Psychological antecedents of student procrastination. *Australian Psychologist, 23,* 207-217. doi:10.1080/00050068808255605

Bui, N. H. (2007). Effect of evaluation threat on procrastination behavior. *The Journal of Social Psychology, 147,* 197-209. doi:10.3200/SOCP.147.3.197-209

Chu, A. H. C., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *Journal of Social Psychology, 14,* 245-264.

Covington, M. V. (1992). *Making the grade: A self-worth perspective on motivation and school reform*. New York: Cambridge University Press.

Creswell, J. W., & Plano-Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, Calif: SAGE Publications.

Ferrari, J. R. (1991). A preference for a favorable public impression by procrastinators: Selecting among cognitive and social tasks. *Personality and Individual Differences, 12,* 1233-1237. doi:10.1016/0191-8869(91)90090-X

Ferrari, J. R. (2001). Procrastination as self-regulation failure of performance: Effects of cognitive load, self-awareness, and time limits

on working best under pressure. *European Journal of Personality, 15,* 391-406. doi:10.1002/per.413

Ferrari, J. R., Parker, J. T., & Ware, C. B. (1992). Academic procrastination: Personality correlates with Myers-Briggs types, self-efficacy, and academic locus of control. *Journal of Social Behavior and Personality, 7,* 495-502.

Ferrari, J. R., & Tice, D. M. (2000). Procrastination as a self-handicap for men and women: A task-avoidance strategy in a laboratory setting. *Journal of Research in Personality, 34,* 73-83. doi:10.1006/jrpe.1999.2261

Gay, L. R., Mills, G. E., & Airasian, P. (2009). *Educational research: Competencies for analysis and applications*. Upper Saddle River, NJ: Pearson Prentice Hall.

Haycock, L. A., McCarthy, P., & Skay, C. L. (1998). Procrastination in college students: The role of self-efficacy and anxiety. *Journal of Counseling and Development, 76,* 317-324.

Howell, A. J., & Buro, K. (2009). Implicit beliefs, achievement goals, and procrastination: A meditational analysis. *Learning and Individual Differences, 19,* 151-154. doi:10.1016/j.lindif.2008.08.006

Howell, A. J., & Watson, D. C. (2007). Procrastination: Associations with achievement goal orientation and learning strategies. *Personality and Individual Differences, 43,* 167-178. doi:10.1016/j.paid.2006.11.017

Howell, A. J., Watson, D. C., Powell, R. A., & Buro, K. (2006). Academic procrastination: The pattern and correlates of behavioral postponement. *Personality and Individual Differences, 40,* 1519-1530. doi:10.1016/j.paid.2005.11.023

Jones, E. E., & Rhodewalt, F. (1982). *The self-handicapping scale*. Available from F. Rhodewalt, Department of Psychology, University of Utah, Salt Lake City, UT.

Keller, J. M. (2010). *Motivational design for learning and performance: The ARCS model approach.* New York, NY: Springer. doi:10.1007/978-1-4419-1250-3

Klassen, R. M., Ang, R. P., Chong, W. H., Krawchuk, L. L., Huan, V. S., Wong, I. Y. F., & Yeo, L. S. (2010). Academic procrastination in two settings: Motivation correlates, behavioral patterns, and negative impact of procrastination in Canada and Singapore. *Applied Psychology: An International Review, 59,* 361-379.

Klassen, R. M., Krawchuk, L. L., Lynch, S. L., & Rajani, S. (2008). Procrastination and motivation of undergraduates with learning disabilities: A mixed-methods inquiry. *Learning Disabilities Research and Practice, 23,* 137-147. doi:10.1111/j.1540-5826.2008.00271.x

Klassen, R. M., Krawchuk, L. L., & Rajani, S (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology, 33,* 915-931. doi:10.1016/j.cedpsych.2007.07.001

Krathwohl, D. R. (1998). *Methods of educational and social science research: An integrated approach* (2nd ed.). New York: Longman.

Krueger, R. A. (1994). *Focus groups: A practical guide for applied research* (2nd ed.). Thousand Oaks, CA: Sage.

Lay, C. H. (1986). At last, my research article on procrastination. *Journal of Research in Personality, 20,* 474-495. doi:10.1016/0092-6566(86)90127-3

Lay, C. H. (1994). Trait procrastination and affective experiences: Describing past study behavior and its relation to agitation and dejection. *Motivation and Emotion, 18,* 269-284. doi:10.1007/BF02254832

Lay, C. H., Knish, S. & Zanatta, R. (1992). Self-handicappers and procrastinators: A comparison of their practice behavior prior to an evaluation. *Journal of Research in Personality, 26,* 242-257. doi:10.1016/0092-6566(92)90042-3

Lay, C. H., & Schouwenburg, H. C. (1993). Trait procrastination, time management, and academic behavior. *Journal of Social Behavior and Personality, 8,* 647-662.

McCown, W., Petzle, T., & Rupert, P. (1987). An experimental study of some hypothesized behaviors and personality variables of college student procrastinators. *Personality and Individual Differences, 8,* 781-786. doi:10.1016/0191-8869(87)90130-9

Owens, S. G., Bowman, C. G., & Dill, C. A. (2008). Overcoming procrastination: The effect of implementation intentions. *Journal of Applied Social Psychology, 38,* 366-384.

doi:10.1111/j.1559-1816.2007.00309.x

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66,* 543-578.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451-502). New York: Academic Press.

Pintrich, P. R., & de Groot, E. V. (1990) Motivational and self-regulation learning components of classroom academic performance. *Journal of Educational Psychology, 82,* 33-40. doi:10.1037/0022-0663.82.1.33

Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)* (Tech. Report No. 91-B-004). Boards of Regents, University of Michigan, Ann Arbor, MI.

Rhodewalt, F. (1990). Self-handicappers: Individual differences in the preference for anticipatory self-protective acts. In R. Higgins, C. R. Snyder & S. Berglas (Eds.), *Self-handicapping: The paradox that isn't* (pp. 69-106). New York: Guilford Press.

Rhodewalt, F., & Vohs, K. D. (2005). Defensive strategies, motivation, and the self: A self-regulatory process view. In A. J. Elliot, & C. S. Dweck (Eds.). *Handbook of competence and motivation* (pp. 548-565). New York, NY: The Guilford Press.

Scholz, U., Dona, B. G., Sud, S., & Schwarzer, R. (2002). Is general self-efficacy a universal construct? Psychometric findings from 25 countries. *European Journal of Psychological Assessment, 18,* 242-251. doi:10.1027//1015-5759.18.3.242

Schouwenburg, H. C. (1995). Academic procrastination: Theoretical notions, measurement, and research. In J. R. Ferrari, & J. L. Johnson (Eds.), *Procrastination and task avoidance: Theory, research, and treatment* (pp. 71-96). New York: Plenum Press.

Schraw, G., Wadkins, T., & Olafson, L. (2007). Doing the things we do: A grounded theory of academic procrastination. *Journal of Educational Psychology, 99,* 12-25. doi:10.1037/0022-0663.99.1.12

Schunk, D. H. (2005). Self-regulated learning: The educational legacy of Paul R. Pintrich. *Educational Psychologist, 40,* 85-94. doi:10.1207/s15326985ep4002_3

Schwarzer, R., Bäßler, J., Kwiatek, P., Schröder, K., & Zhang, J. X. (1997). The assessment of optimistic self-beliefs: Comparison of the German, Spanish, and Chinese versions of the General Self-Efficacy scale. *Applied Psychology: An International Review, 46,* 69-88. doi:10.1111/j.1464-0597.1997.tb01096.x

Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio* (pp. 35-37). Windor, UK: Nfer-Nelson.

Senecal, C., Lavoie, K., & Koestner, R. (1997). Trait and situational factors in procrastination: An interactional model. *Journal Social Behavior and Personality, 12,* 889-903.

Seo, E. H. (2009). The relationship of procrastination with a mastery goal versus an avoidance goal. *Social Behavior and Personality, 37,* 911-920.

Sirois, F. M. (2004). Procrastination and intentions to perform health behaviors: The role of self-efficacy and the consideration of future consequences. *Personality and Individual Differences, 37,* 115-128. doi:10.1016/j.paid.2003.08.005

Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology, 31,* 503-509. doi:10.1037/0022-0167.31.4.503

Solomon, L. J., & Rothblum, E. D. (1994). Procrastination Assessment Scale-Students (PASS). In J. Fischer, & K. Corcoran (Eds.), *Measures for clinical practice* (pp. 446-452). New York, NY: The Free Press.

Sperling, R. A., Rectenwald, A. L., Park, S. W., & Sloan, J. (2009). *Development and construct examination of the students' text anxiety scale*. Paper presented at the annual meeting of American Psychological Association, Toronto, Canada.

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin, 133,* 65-94. doi:10.1037/0033-2909.133.1.65

Strack, F. (1999). Beyond dual-process models: Toward a flexible regulation system. *Psychological Inquiry, 10,* 166-169. doi:10.1207/S15327965PL100213

Thayer, J. F., & Lane, R. D. (2000). A model of neurovisceral integration in emotion regulation and dysregulation. *Journal of Affective Disorders, 61,* 201-216.

Thompson, T., & Dinnel, D. L. (2003). A validation and reliability study of the self-worth protection scale. *British Journal of Educational Psychology, 73,* 89-107. doi:10.1348/000709903762869932

Thompson, T., & Dinnel, D. L. (2007). Is self-worth protection best regarded as intentional self-handicapping behavior or an outcome of choking under pressure? *Educational Psychology, 27,* 509-531. doi:10.1080/01443410601159910

Tice, D. M., & Baumeister, R. F. (1997). Longitudinal study of procrastination, performance, stress, and health: The costs and benefits of dawdling. *Psychological Science, 8,* 454-458. doi:10.1111/j.1467-9280.1997.tb00460.x

van Eerde, W. (2003). A meta-analytically derived nomological network of procrastination. *Personality and Individual Differences, 35,* 1401-1418. doi:10.1016/S0191-8869(02)00358-6

van Hooft, E. A. J., Born, M. Ph., Taris, T. W., van der Flier, H., & Blonk, R. W. B. (2005). Bridging the gap between intentions and behavior: Implementation intentions, action control, and procrastination. *Journal of Vocational Behavior, 66,* 238-256. doi:10.1016/j.jvb.2004.10.003

Vohs, K. D., & Baumeister, R. F. (2004). Understanding self-regulation: An introduction. In R. F. Baumeister, & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 1-9). New York, NY: The Guilford Press

Wesley, J. C. (1994). Effects of ability, high school achievement, and procrastinatory behavior on college performance. *Educational and Psychological Measurement, 54,* 404-408. doi:10.1177/0013164494054002014

Wolters, C. A. (2003). Understanding procrastination from a self-regulated learning perspective. *Journal of Educational Psychology, 95,* 179-187. doi:10.1037/0022-0663.95.1.179

Wolters, C. A. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement. *Journal of Educational Psychology, 96,* 236-250. doi:10.1037/0022-0663.96.2.236

Zimmerman, B. J. (2000). Attaining self-regulation. A Social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). San Diego, CA: Academic Press.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice, 41,* 64-70. doi:10.1207/s15430421tip4102_2