Metacognition Learning (2017) 12:381–399
DOI 10.1007/s11409-017-9174-1

Examining the relations of time management and procrastination within a model of self-regulated learning

Christopher A. Wolters[1] · **Sungjun Won**[1] · **Maryam Hussain**[2]

Received: 19 December 2016 / Accepted: 6 June 2017 / Published online: 28 June 2017

Abstract The primary goal of this study was to investigate whether college students' academic time management could be used to understand their engagement in traditional and active forms of procrastination within a model of self-regulated learning. College students (N = 446) completed a self-report survey that assessed motivational and strategic aspects of self-regulated learning, time management, and procrastination. Results of regression analyses indicated that self-efficacy and metacognitive strategies initially were significant predictors of traditional and active forms of procrastination. Incorporating time management in the analyses increased the amount of the variance explained and, even in the presence of the motivation and strategy variables, time management emerged as an important predictor of both traditional and active forms of procrastination. Findings support the conclusion that academic time management is a key aspect of self-regulated learning and, as such, it can be useful for understanding the extent to which college students procrastinate when doing their academic work.

Keywords Self-regulation · Procrastination · Motivation · Time management · College

People's ability to manage their time wisely as well as their propensity to misappropriate time both have been the frequent subject of scholarly research (Claessens et al. 2007; Steel 2007). Consistent with the former, time management represents a strategic process that promotes the accomplishment of important goals and success within personal, professional, and academic contexts (Claessens et al. 2007). In contrast, procrastination reflects unnecessary delays and dilatory behaviors that are most often considered a misuse of time that ultimately limits

✉ Christopher A. Wolters
wolters.21@osu.edu

[1] Dennis Learning Center, Department of Educational Studies, The Ohio State University, Columbus, OH 43210, USA

[2] University of Delaware, Newark, DE 19716, USA

performance and impedes individuals' ability to reach their goals (Chu and Choi 2005; Lay and Schouwenburg 1993; Steel 2010). Following these basic theoretical understandings, one would assume that time management and procrastination are discordant processes that would exhibit a clear negative relationship. Empirical studies that test this assumption, however, are quite limited (e.g., Chu and Choi 2005; Lay and Schouwenburg 1993; Park and Sperling 2012). Further, some researchers have argued that under certain conditions deliberately delaying academic work can be an adaptive expression of time management that is beneficial to students' academic success (Choi and Moran 2009; Kim and Seo 2013; Schraw et al. 2007). Our aim in this study was to extend the understanding of these processes by investigating the relations between college students' time management and their reported levels of both traditional and active forms of procrastination. Further, we examine these relations within a model of self-regulated learning (SRL) that has proven useful for understanding college students' engagement, learning and academic success (Pintrich and Zusho 2007; Zimmerman 2000), and that has specifically been used to study time management and procrastination within academic contexts (Cao 2012; Kitsantas et al. 2008; Park and Sperling 2012; Zimmerman et al. 1994).

Academic time management

Broadly speaking, academic time management describes students' efforts to budget the use of their time purposefully and efficiently in order to increase the likelihood of achieving important educational goals within a given period of time (Claessens et al. 2007; Koch and Kleinmann 2002). Time management is not considered a single trait, ability, or skill, but rather is characterized as a multidimensional process through which students deliberately govern when, where, and for how long they engage in academic work. As such, time management fits well within a SRL framework wherein it has been portrayed as a manifestation of students' regulation of their overt behavior (Dembo and Eaton 2000; Pintrich and Zusho 2007; Zimmerman et al. 1994) or simply as an important aspect of planning and goal setting (Boekaerts 1996; Winne and Hadwin 1998). As a part of students' SRL, the process of time management is assumed to be dependent on students' use of strategies as well as on their motivational beliefs and attitudes.

The particular strategies that students use to manage their time are diverse and vary somewhat among researchers and the assessments they use (Bond and Feather 1988; Britton and Tesser 1991; Burt et al. 2010; Macan 1994). For instance, Macan and her colleagues (Macan 1994; Macan et al. 1990; Macan et al. 2010) differentiate between strategies related to setting goals and establishing priorities and a diverse array of specific tactics for regulating their time. In contrast, Britton and Tesser (1991) distinguish short-range strategies that focus on the day-to-day planning and organization of time from long-range strategies that regulate their effort with regard to a longer time horizon. Bond and Feather (1988) include one scale that assesses whether students plan and follow a daily routine and another that reflects whether they have trouble being organized and being sure of what they should do next. Finally, SRL researchers have typically used a scale from Pintrich et al. (1993) that assesses students' general self-beliefs about whether they manage their time well, exhibit behaviors consistent with effective time management, and regulate where they study. Despite this lack of hegemony in the particular types of strategies that are viewed as important, there is general agreement among researchers that the use of regulatory strategies is an essential element for effective time management.

Although less consistently highlighted, the motivation required to energize and facilitate students' execution of the effortful strategies that control when, where, and for how long they engage in academic work is also a key dimension of time management. Following Macan (1994), researchers often have characterized students' attitudes about the usefulness of following a schedule and being organized with their time as a key dimension of time management. Research consistently shows positive correlations between these preferences about managing their time and the reported use of strategies for time management (Adams and Jex 1999; Chang and Nguyen 2011; Macan 1994; Macan et al. 2010). College students who express more adaptive motivational beliefs and attitudes, such as greater self-efficacy and task value, also tend to report increased management of their time and study environment (Bembenutty 2009; Burlison et al. 2009; Kitsantas et al. 2008; Park and Sperling 2012).

In theory, increased or more effective time management should be associated with improved academic functioning and higher levels of learning and performance. In support of this assumption, college students' use of time management strategies has been correlated positively with their reported use of cognitive, metacognitive and self-regulatory strategies known to support learning and achievement (Britton and Tesser 1991; Burlison et al. 2009; Kesici et al. 2011; Kitsantas et al. 2008; Lynch 2006, 2010; Macan et al. 1990; Park and Sperling 2012). As well, several studies have produced positive correlations between dimensions of students' time management and their grades or other indicators of academic performance (Britton and Tesser 1991; Burlison et al. 2009; Kitsantas et al. 2008; Lynch 2006, 2010; Macan et al. 1990). Students provided training in managing their time also have been found to show improved academic and well-being outcomes compared to those who did not receive this training (Burrus et al. 2013; Hafner et al. 2013).

Representing a notable limitation in this work, however, only a handful of researchers have examined time management, motivational and other strategic aspects of SRL together as potential predictors of students' academic functioning (Albaili 2010; Bembenutty 2009; Burlison et al. 2009; Kitsantas et al. 2008; Lynch 2006). On the whole, these studies support the importance of time management for understanding students' functioning within academic contexts. For example, Kitsantas and colleagues found that college students' time and study environment management was a predictor of their grades at the end of their first and fifth semester, even when accounting for their high school grades, use of metacognitive strategies, self-efficacy and task value. Similarly, Burlison and colleagues found that time management accounted for variance in college students' exam grades even when accounting for self-efficacy and standardized aptitude measures. Although the studies in this area support a tentative connection between college students' time management and their academic functioning and performance, it is far from conclusive. We contribute to this work by investigating whether time management along with additional motivational and strategic aspects of SRL can be used to understand several indicators of college students' procrastination.

Academic procrastination

The extensive literature on procrastination has produced several competing views about the nature of this phenomenon (Ferrari 2004; Steel 2007). For instance, researchers have disagreed about the extent to which procrastination should be viewed as stable or trait-like, the necessity of concomitant anxiety, stress or apprehension, and the importance of distinctions among types of dilatory behaviors (Grunschel et al. 2013; Klingsieck 2013). In line with others (Ferrari and

Diaz-Morales 2007; Steel 2007, 2010), we conceive of traditional procrastination simply as postponing the behaviors or decisions necessary for initiating and completing tasks that one intends to complete. Academic procrastination, more specifically, reflects unnecessarily delaying the decision-making or actions necessary for the tasks, assignments, or other school-related obligations that one intends to complete. Researchers have consistently found that these dilatory behaviors are a pervasive, almost ubiquitous, occurrence within adult and college populations. For instance, some estimates suggest that over 75% of university students procrastinate on a regular basis, (Ferrari et al. 2007; Schraw et al. 2007; Steel 2007).

Traditional perspectives of procrastination almost uniformly characterize it as a maladaptive, dysfunctional, or self-handicapping behavior that detracts from individuals' productivity, learning, and overall achievement (Ackerman and Gross 2005; Solomon and Rothblum 1984; Steel 2007). In large part, research has supported this deleterious view of procrastination. Studies consistently show that increased procrastination is associated with lower levels of learning or decreased academic performance (Ferrari 2004; Kim and Seo 2013; Pychyl et al. 2000; Tice and Baumeister 1997). Procrastination also has been linked repeatedly to negative indicators of individuals' physical health, well-being and job performance (Kim and Seo 2013; Schouwenburg et al. 2004). Overall, there is strong evidence that the delays in decision making and engagement emblematic of traditional forms of procrastination interfere with optimal performance and, therefore, are a sign of poor academic functioning.

Nevertheless, some researchers balk at the customary perspective that postponements, delays and other hallmarks of academic procrastination are necessarily harmful to learning and achievement (Choi and Moran 2009; Kim and Seo 2013; Knaus 2000; Schraw et al. 2007). According to this alternative perspective, forms of academic delay that are done more purposefully and with strategic intentions can be adaptive and perhaps even an expression of students' engagement in time management or SRL (Choi and Moran 2009; Kim and Seo 2013; Knaus 2000; Schraw et al. 2007). Deliberate decisions to delay certain tasks may clear the way to complete higher priority tasks, reduce short-term anxiety, or conserve time by reducing the effort provided to low-value activities (Corkin et al. 2011). This type of deliberate delay has been termed active procrastination (Choi and Moran 2009) or active delay (Corkin et al. 2011) to differentiate it from traditional or passive forms of procrastination. Although we agree with Corkin and colleagues that active delay may be a more appropriate and less confusing term for this phenomenon, we continue to use the term active procrastination so as to remain consistent with the majority of studies in this area.

Active procrastination most often has been conceived as having four dimensions that include the intentional decision to delay initiating academic tasks, the ability to get work completed within specified deadlines or restrictions, an affinity for the pressure of working under close deadlines, and satisfaction with the consequences of doing work at the last minute (Choi and Moran 2009). Empirical support for this presumed conceptual structure, as well as the more basic distinction between traditional and active procrastination, is limited and conflicting (Corkin et al. 2011; Hensley 2014). For instance, only three studies have included an evaluation of the factor structure of the principal instrument used to assess active procrastination, (Choi and Moran 2009; Chu and Choi 2005; Hensley 2014), with one concluding that pressure aversion and outcome satisfaction might best be considered as a single construct (Hensley 2014). Researchers have found traditional procrastination and a composite measure of active procrastination to be correlated positively (Cao 2012), negatively (Corkin et al. 2011; Hensley 2014; Seo 2013), or not at all (Choi and Moran 2009; Chu and Choi 2005). These conflicting findings suggest a continuing need to understand the nature of active

procrastination, including whether it can be differentiated from more traditional forms of procrastination and how it fits within a model of SRL.

Time management and academic procrastination

Time management, as well as SRL more generally, are both viewed as incompatible with the unnecessary, anxiety-provoking, and often debilitating delays in completing academic work that are emblematic of traditional views of procrastination (Cao 2012; Corkin et al. 2011; Ferrari 2001; Park and Sperling 2012; Steel 2007; Tuckman 1991; van Eerde 2000; Wolters 2003). Students who effectively self-regulate their learning and manage their time should not needlessly delay their completion of required academic activities, especially if it impedes progress toward important learning goals. One would expect, therefore, that students who show evidence of increased and more effective time management would tend to demonstrate lower levels of traditional procrastination. In contrast, active procrastination is theoretically more consistent with effective time management and SRL implying that they may be associated positively (Cao 2012; Choi and Moran 2009). Surprisingly, however, the empirical evidence available to support either of these expectations is limited and relatively weak.

Direct evidence regarding the relation of time management and traditional forms of procrastination comes from just a handful of published studies. In one early study, Lay and Schouwenburg (1993) found negative correlations between college students' tendency to procrastinate and three aspects of their time management including setting goals and priorities, planning and scheduling strategies, and their perceived control of time. Likewise, Park and Sperling (2012) found that college students categorized as high procrastinators reported lower levels of time and study environment management than those categorized as low procrastinators. In two related studies, Choi and his colleagues (Choi and Moran 2009; Chu and Choi 2005) found evidence that increased procrastination was associated with less purposeful use of time, perceived control of time, and efforts to structure time. Finally, Cao (2012) found that a measure of time and study environment management was a negative predictor of procrastination, even when accounting for a number of motivational and strategy use variables.

To this point, just three studies (Cao 2012; Choi and Moran 2009; Chu and Choi 2005) have examined potential links between time management and any measure of active procrastination. Choi and colleagues (Choi and Moran 2009; Chu and Choi 2005) found that a composite indicator of active procrastination was correlated positively with students' perceptions that they were in control of their time; perceptions that are typically thought to increase as a consequence of managing one's time (Macan 1994). In contrast, higher levels of active procrastination were associated with lower levels of time structure, a more direct reflection of students' use of time management strategies in both studies. As well, Cao (2012) found no clear evidence to support a connection between active procrastination and students' self-reported use of time and study management strategies.

In addition to the basic paucity of studies, strong conclusions regarding the association of time management with either form of procrastination are impeded by at least three other shortcomings. First, three of the five studies were conducted with relatively small samples making any broader generalizations somewhat tentative (Cao 2012; Lay and Schouwenburg 1993; Park and Sperling 2012). Second, only two of the studies (Cao 2012; Chu and Choi 2005) examined the relations of time management and procrastination with analyses that accounted for a wider set of motivational and strategy use variables. The simple bivariate

analyses utilized in the remaining studies (Choi and Moran 2009; Lay and Schouwenburg 1993; Park and Sperling 2012), limit the strength of any conclusions. Finally, the assessment of students' use of time management strategies in the majority of these studies was problematic. Two studies (Cao 2012; Park and Sperling 2012) utilized the time and study environment scale from Pintrich et al. (1993). This scale assesses students' general perceptions of themselves as good at managing their time rather than any specific strategies; it also confounds time management with control of the study environment. Two other studies (Choi and Moran 2009; Chu and Choi 2005) relied on just one short scale (i.e., time structure) to assess students' actual use of strategies for managing their time, whereas additional scales reflected students' perceptions that they were in control and felt purposeful about their use of time. These shortcomings, together with the overall shortage of studies, indicates a conspicuous need for additional research in which the relations between college students' time management and their engagement in dilatory behaviors are investigated.

Research goals

We address this need by examining whether college students' self-reported time management can be used to predict their reported level of both traditional and active forms of procrastination. Further, we conduct this study with a large and diverse sample from an urban public university, and by using a multi-faceted measure of students' time management. Finally, we test the relations of time management and both forms of procrastination within a larger framework that includes motivational (i.e., self-efficacy, value) and strategic (i.e., metacognitive, motivational strategy use) aspects of SRL. Our primary goal was to evaluate whether college students' time management could be used to predict their reported levels of traditional and more active forms of academic procrastination. In line with theoretical assumptions, we expected that students who expressed increased and more effective forms of time management would be less likely to report engagement in traditional procrastination. Given the conflicting findings in prior research, we were uncertain how or whether time management would be related to indicators of more deliberate academic delays. Because we explored these relations using a model of SRL, a second goal was to extend the understanding of how the motivational and strategic aspects of SRL, apart from time management, are related to college students' procrastination and active delay. Finally, a third objective was to evaluate the relation between traditional and more active forms of procrastination and to consider whether distinguishing between these constructs is justified.

Method

Participants

Participants ($N = 446$) were students at a large public university in the United States recruited from several undergraduate courses. The sample had a mean age of 21.26 years ($SD = 4.41$), was mostly female ($n = 369$, 82%), and reported their race/ethnicity as African-American ($n = 76$, 17%), Asian/Pacific Islander ($n = 101$, 23%), Hispanic ($n = 120$, 27%), White ($n = 120$, 27%), or Other ($n = 28$, 6%). Students were in their first year ($n = 138$, 31%), sophomores ($n = 92$, 21%), juniors ($n = 123$, 28%), or seniors ($n = 92$, 21%).

Measures

Students completed an online self-report survey with an initial section of items to assess age, gender, ethnicity, and academic rank. The remainder of the survey consisted of Likert-styled items with a response scale ranging from 1 (*not at all true of me*) to 5 (*very true of me*). Instructions directed students to respond to these items with regard to school, coursework, or academics in general. As well, some individual items from the time management and procrastination instruments were modified slightly to increase students' focus on academic contexts when responding.

Motivation and regulation strategies We assessed two aspects of motivation and two types of self-regulatory strategies common within models of SRL. The six *value* items were derived from Wolters (2003) and assessed how useful, important, and interesting participants viewed the material covered in their current courses (α = .86). Adapted from Pintrich et al. (1993), the five *self-efficacy* items reflected participants' confidence in their ability to successfully learn the material, master the skills, or do well on tests and assignments (α = .87). *Metacognitive strategies* (α = .84) consisted of nine items that measured participants' use of techniques for planning, monitoring, and managing their use of learning strategies (Wolters 2003). Fourteen items from Wolters and Benzon (2013) were administered to assess students' use of *motivational strategies* linked to self-consequating, regulation of value, or regulation of performance goals to sustain or increase their engagement in academic tasks (α = .91).

Time management We selected Macan's (1994) *Time Management Behavior Scale* (29 items) to assess students' academic time management. Consistent with a model of SRL and unlike other measures, this widely used instrument assesses motivational aspects of time management as well as students' use of two types of strategies. *Setting goals and priorities* (10 items) tapped into students' tendency to establish academic goals or deadlines for themselves, to prioritize various school tasks, or to monitor and be efficient with their use of time and effort (α = .84). *Mechanics* (11 items) assessed students' tendency to engage in various strategies or behaviors that reflected more direct or active control of the time and effort devoted to schoolwork (α = .78). *Preference for organization* (8 items) reflected the extent to which students believed that being organized or that scheduling and planning were useful or might help performance (α = .76). Hence, this scale assessed students' motivational attitudes about managing their time rather than specific behaviors or strategies they used to do so. Support for the validity of these scales comes from studies examining time management within college student and adult populations (Adams and Jex 1999; Macan 1994; Macan et al. 2010; Shahani et al. 1993).

Procrastination *Procrastination* (α = .90) was assessed using Steel's (2010) 12-item *Pure Procrastination Scale*. Students with higher scores on this scale reported a greater tendency to put off or postpone schoolwork despite intentions or a previous decision to complete the work, as well as a greater tendency to actually miss deadlines or run out time to finish their academic work. Students also responded to Choi and Moran's (2009) *Active Procrastination Scale* (16 items). Consistent with prior studies (Choi and Moran 2009; Hensley 2014; Seo 2013) and to allow greater precision in investigating the relations with time management, we wanted to use these items to form four scales that each represented an aspect of active procrastination. Although the overall fit was not extraordinary, a confirmatory factor analyses indicated that

a four factor model with one error covariance was reasonable, $\chi^2(97, N = 446) = 270.52$, $p < .001$ (TLI = .903, CFI = .922, RMSEA = .063, SRMR = .062). *Intentional decision to delay* ($\alpha = .76$) reflected students' tendency to purposefully postpone the start of academic tasks as a motivational or time management strategy (e.g., "I intentionally put off schoolwork to maximize my motivation"). Hence, this scale differed from traditional measures of procrastination because it focused on delay that is deliberate and strategic. *Ability to meet deadlines* ($\alpha = .78$) represented students' ease in accomplishing their goals and finishing activities once they had been started and before they are due (e.g., "I'm often running late when getting things done for school", reverse coded). Although the reverse coding of all four items allowed it to be interpreted as a positive quality, the construct assessed by this scale appears conceptually similar to one aspect of procrastination. *Preference for Pressure* ($\alpha = .76$) represented the extent to which students had an affinity for working under pressure or having to rush to complete work at the last minute (e.g., "I feel tense and cannot concentrate when there's too much time pressure on me", reverse coded). *Outcome Satisfaction* ($\alpha = .70$) assessed students' attitude that getting things done at the last minute or working under a deadline produced results that were acceptable or even better than when work were completed earlier (e.g., "If I put assignments off until the last moment, I'm not satisfied with their outcomes", reverse coded). Unlike intentional delay and ability to meet deadlines, these latter two scales did not assess particular actions but rather students' attitudes, beliefs, or reactions regarding their dilatory behaviors. Higher scores on each of these four scales can be interpreted as evidence of increased active procrastination.

Results

Descriptive and correlational analyses

Table 1 presents means, standard deviations, and bivariate correlations for all major variables. Generally, the means for the motivational and strategic aspects of SRL appeared similar to those found in prior studies of college students (Corkin et al. 2011; Kitsantas et al. 2008; Wolters 2003). Means and *SD*s for the time management strategies were on par with those for the metacognitive and motivational strategies. In contrast, the means for procrastination and intentional delay measures were somewhat lower. Still, assuming an approximately normal distribution of these constructs within the college-student population, these means indicate that a large majority of students reported levels of dilatory behavior consistent with the assumption that delays and postponement of academic tasks is a widespread phenomenon among this population.

As presented in Table 1, the two types of time management strategies were strongly correlated with one another, and with the reported use of metacognitive and motivational strategies. Although not as strong, preference for organization also was correlated positively with the time management strategies and other two regulatory strategies. All three indicators of time management were also associated moderately with increased task value and greater self-efficacy. Together this pattern of moderate to strong positive correlations supports the assumption that time management is an adaptive aspect of students' overall engagement in SRL.

Procrastination and ability to meet deadlines exhibited a strong negative correlation. As well, each showed a very similar pattern of correlations with the time management, SRL, and

Table 1 Means, Standard Deviations, and Bivariate Correlations for Major Variables in the Study (N = 446)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Preference for organization	--											
2. Setting goals & priorities	.29***	--										
3. Mechanics	.39***	.74***	--									
4. Value	.28***	.28***	.32***	--								
5. Self-efficacy	.21***	.32***	.30***	.62***	--							
6. Metacognitive strategies	.29***	.60***	.45***	.46***	.50***	--						
7. Motivational strategies	.24***	.52***	.46***	.43***	.43***	.62***	--					
8. Procrastination	−.48***	−.48***	−.47***	−.25***	−.25***	−.36***	−.30***	--				
9. Ability to meet deadlines	.48***	.42***	.40***	.32***	.34***	.37***	.33***	−.83***	--			
10. Intentional delay	−.49**	−.26***	−.26***	−.13***	−.10*	−.15***	−.09	.59***	−.46***	--		
11. Preference for pressure	.17***	.06	.11*	.12**	.22***	.08	.10*	−.45***	.50***	−.17***	--	
12. Outcome satisfaction	−.12*	−.09*	−.04	.04	.07	−.09	−.04	−.17***	.25***	.15**	.55***	--
α	.76	.84	.78	.86	.87	.84	.91	.90	.78	.76	.76	.70
M	3.69	3.52	3.58	3.85	3.84	3.62	3.89	2.67	3.75	2.54	3.15	2.83
SD	.72	.70	.68	.78	.74	.71	.71	.83	.89	.93	.94	.88

The response scale for all variables ranged from 1 (*Not at all true of me*) to 5 (*Very true of me*)

* $p < .05$. ** $p < .01$. *** $p < .001$

remaining indicators of active procrastination with regard to absolute magnitude, although with the opposite valence (See Table 1). On average, decreased procrastination and greater ability to meet deadlines were reported by students who expressed motivational beliefs and strategies considered adaptive for time management and SRL. A similar, although somewhat weaker, pattern was found for intentional delay (see Table 1). Preference for pressure and outcome satisfaction, in general, showed a much weaker and more sporadic pattern of correlations with the measures of time management and SRL. Overall, these findings provide preliminary evidence supporting the view that students' engagement in time management and SRL are inconsistent with increased procrastination and intentional delay but more congruent with students' reported ability to get work done by due dates.

Time management and SRL as predictors of procrastination

Next, we conducted a separate two-step hierarchical regression for each of our five indicators of procrastination. The first step represented a customary SRL model and included value, self-efficacy, motivational and metacognitive strategies.[1] The second step, representing a time management model, added preference for organization and the two time management strategies. This two-step procedure was selected because it allows for insights into whether, when accounting for the more commonly studied aspects of SRL, students' attitudes and strategies associated with time management could be used to explain variance in the five indicators of procrastination. Given the pattern of significant bivariate correlations among the predictors, we evaluated multicollinearity to ensure that the estimation of the regression coefficients was stable and standard errors were not inflated. The variance inflation factor and tolerance statistics indicated that multicollinearity was not a concern in all regression models.

Step 1/SRL model As presented in Table 2, the motivational and strategic aspects of SRL explained a significant level of variance in each of the procrastination variables when entered together in the first step. The amount of variance explained was much higher for procrastination ($R^2 = .14$, $p < .001$) and ability to meet deadlines ($R^2 = .19$, $p < .001$) than for intentional delay ($R^2 = .03$, $p < .05$), preference for pressure ($R^2 = .05$, $p < .001$), and outcome satisfaction ($R^2 = .03$, $p < .05$). Across these separate analyses, students who expressed greater use of metacognitive strategies tended to report greater ability to meet deadlines but decreased procrastination, intentional delay, and satisfaction with the outcomes of doing work at the last minute (see Table 2). As well, students who expressed greater confidence in their ability to be academically successful reported greater ability to meet deadlines, increased affinity for working under pressure, and greater satisfaction with the outcomes of doing work at the last minute. Value and motivational strategies both failed to emerge as individual predictors for any measure of procrastination.

[1] Because gender differences in self-regulated learning, time management and procrastination have been found in some studies (Macan et al. 1990; Meece and Painter 2008; Steel 2007), we investigated whether accounting for sex was necessary for properly understanding the relations examined by our analyses. When included as part of the SRL model, findings indicated that sex was a significant predictor for just one aspect of procrastination (i.e., it was a significant but relatively weak negative predictor for intentional delay). More critically, accounting for sex produced no noticeable changes in the pattern of findings for the SRL or time management predictors. As a result, we did not include sex in the final analyses presented here.

Step 2/time management model Adding the three aspects of time management in the second step substantially increased the amount of variance explained for procrastination (ΔR^2 = .22, $p < .001$), ability to meet deadlines (ΔR^2 = .17, $p < .001$), intentional delay (ΔR^2 = .24, $p < .001$), and to a much lesser extent, for preference for pressure (ΔR^2 = .02, $p < .05$) and outcome satisfaction (ΔR2 = .02, $p < .05$). When accounting for the time management measures, metacognitive strategies no longer served as an important individual predictor for any indicator of procrastination. In contrast, the strength of self-efficacy as a predictor for ability to meet deadlines, preference for pressure and outcome satisfaction was unchanged (see Table 2).

Among the three time management measures, setting goals and priorities as well as preference for organization emerged as strong individual predictors for procrastination, ability to meet deadlines, and intentional delay (see Table 2). On average, students who reported greater use of time management strategies based on setting goals and priorities tended to report less procrastination and intentional delay, along with an increased ability to meet deadlines. Similarly, students who viewed using a schedule and being organized about their time as useful also tended to report lower levels of procrastination and intentional delay, but increased ability to meet deadlines. Preference for organization was also an individual predictor of greater preference for pressure and less satisfaction with the outcomes of doing work at the last minute. Interestingly, students reported engagement in behaviors more directly controlling their time emerged as an individual negative predictor only for the traditional measure of procrastination (see Table 2).[2]

Discussion

The unnecessary delays and postponements emblematic of procrastination are viewed consistently as an impediment to the academic success and general well-being of college students (Schouwenburg et al. 2004; Steel 2007). Time management, as well as SRL more generally, have been characterized as discordant to the dilatory behaviors associated with procrastination (Cao 2012; Corkin et al. 2011; Ferrari 2001; Park and Sperling 2012; Steel 2007; Tuckman 1991; van Eerde 2000; Wolters 2003). Students who manage their time effectively should, of course, be less prone to the misappropriation of time and effort characterized by procrastination. To this point, however, only a few studies (Cao 2012; Lay and Schouwenburg 1993; Park and Sperling 2012) had examined directly the connection between students' time management and their tendency to procrastinate during the completion of academic work.

Designed to address this limitation, our findings support three noteworthy contributions regarding time management, SRL and their relation to academic procrastination. First, and most importantly, our findings show that college students' time management can be used to understand their self-reported levels of traditional and more intentional forms of academic

[2] To provide a check on these findings, we conducted a second set of regressions in which the Time Management model was entered in Step 1, and the SRL model was added in Step 2. Results for Step 1 of these supplemental analyses indicated that the standardized coefficients for the three time management variables were substantially equivalent to those presented in Table 2. In addition, adding the SRL variables as a group increased the amount of variance explained only for Ability to Meet Deadlines (ΔR^2 = .03, $p < .001$) and Preference for Pressure (ΔR^2 = .04, $p <$. 001). Findings from these supplementary analyses, therefore, are overwhelmingly consistent with those presented and discussed here.

Table 2 Standardized Coefficients for Regression Analyses Predicting Five Aspects of Procrastination ($N = 446$)

Predictor	Procrastination		Ability to meet deadlines		Intentional delay		Preference for pressure		Outcome Satisfaction	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Value	−.06	.00	.09	.04	−.09	−.02	−.02	−.06	.04	.05
Self-efficacy	−.05	−.05	.14*	.15**	.01	.00	.25***	.25***	.13*	.13*
Metacognitive strategies	−.24***	−.03	.20***	.02	−.13*	.05	−.06	−.06	−.17**	−.11
Motivational strategies	−.11	.01	.11	.03	.03	.10	.04	.03	−.01	.00
Preference for organization		−.34***		.36***		−.47***		.14**		−.13*
Setting goals & priorities		−.27***		.22***		−.21***		−.08		−.11
Mechanics		−.12*		.02		.02		.07		.09
R^2	.14***	.37***	.19***	.35***	.03*	.27***	.05***	.07***	.03*	.04*
ΔR^2		.22***		.17***		.24***		.02*		.02*

* $p < .05$. ** $p < .01$. *** $p < .001$

procrastination. Second, our findings indicate that time management is a key aspect of SRL, and that SRL provides a useful framework for understanding college students' procrastination. Third, our findings undermine the utility of distinguishing between traditional and more deliberate forms of academic delay, as well as the proposition that the latter should be considered an adaptive expression of SRL. In the remainder of this section, we review the findings that support these points, identify implications for research and practice, and discuss some limitations to these conclusions.

Time management as a predictor of procrastination

Time management has been tied to improved academic functioning and is among the most common academic supports provided to college students (Britton and Tesser 1991; Burlison et al. 2009; Kitsantas et al. 2008; Lynch 2006, 2010; Macan et al. 1990; Truschel and Reedy 2009; Young and Hopp 2014). Our findings add to this work by showing that three motivational and strategic aspects of college students' time management substantially increased the amount of variance explained in a measure of students' academic procrastination as well as two behavioral aspects of active procrastination. We found these relations, furthermore, when accounting for core components of students' SRL including their self-efficacy, value and reported use of metacognitive and motivational strategies. Given the extensive work showing that unnecessary delays and other dilatory behaviors detract from academic performance, well-being and later job performance (Ackerman and Gross 2005; Solomon and Rothblum 1984), this finding substantially strengthens the view that time management is a key non-cognitive factor related to college students' academic engagement and ultimate success.

Our findings also provide insight into the particular aspects of academic time management that may be most important for understanding college students' dilatory behaviors. We found that students' reported use of strategies associated with setting goals, prioritizing, and monitoring their use of time individually predicted decreased procrastination and intentional delay, and increased their reported ability to get work done before deadlines. This aspect of time management, it is worth noting, aligns most closely with processes emphasized within the forethought and monitoring phases within prominent models of SRL (Pintrich and Zusho 2007; Zimmerman 2000). In contrast, students' reported use of strategies more closely aligned

with the regulation of time and effort (i.e., mechanics) was associated more modestly only to decreased traditional procrastination. Although these two types of time management strategies were positively correlated, our findings suggest that setting goals and priorities and monitoring the use of time may be more critical to consider when explaining or working to reduce students' dilatory behaviors. Research that examines more specifically the unique nature of these two types of strategies, how they align with other aspects of SRL and their relative efficacy with regard to a broader set of outcomes represents a potentially fruitful path for the future.

Another key finding is the promising importance of students' attitudes about managing their time. As one might expect, students who expressed more favorable attitudes also tended to report increased use of time management strategies. More critically, we found that students with more positive attitudes about being organized and following a schedule were less likely to report academic delays and more likely to finish the work they started and to do so by the prescribed deadline. Although students' preference for organization previously has predicted perceived control of time (Adams and Jex 1999; Chang and Nguyen 2011; Macan 1994), our findings are the first to link these attitudes more directly to any form of procrastination. More broadly, this finding is in line with models of SRL that regularly stress that engagement, learning and academic success are a function of students' motivation or will to learn as much as they are dependent on their skills or abilities (Pintrich and Zusho 2007; Zimmerman 2000; Winne and Hadwin 1998; Wolters 2003).

Self-regulated learning and procrastination

As a second noteworthy contribution, our findings provide insight into the relations between core aspects of SRL and students' traditional and active forms of procrastination. Most notably, regulation strategies associated with metacognition and motivation failed to predict any indicator of procrastination in our final analyses. This pattern contrasts with earlier work showing that students' who report increased use of metacognitive strategies also report lower levels of traditional procrastination and increased levels of active procrastination (Corkin et al. 2011; Howell and Watson 2007; Wolters 2003). These earlier studies, however, did not account for students' time management when evaluating these relations. The most likely explanation for the conflicting pattern of results, therefore, is simply that students' management of their time has a stronger and more direct relation with students' dilatory behaviors than other regulatory aspects of SRL. Although this conclusion fits with common-sense expectations regarding these constructs, our findings are the first to establish empirically this predominance of time management for explaining students' procrastination.

One implication of this conclusion is that future efforts using a SRL framework to understand and to remediate college students' procrastination should account for students' attitudes and strategies related to when and for how long they engage in academic tasks. Only when accounting for these aspects of time management can the relations of other dimensions of SRL with students' procrastination, and perhaps other aspects of their academic functioning, be fully and accurately understood. More broadly and consistent with earlier studies (Cao 2012; Corkin et al. 2011; Park and Sperling 2012; Steel 2007; Wolters 2003), a related implication is that SRL provides an effective framework for researchers to use when working to understand why some students engage in maladaptive self-handicapping behaviors such as those associated with procrastination.

Our findings also provide insights into the importance of students' motivational beliefs associated with SRL. Even when accounting for the time management and other SRL measures, students who expressed greater confidence in their capability to be successful were more likely to report an increased ability to meet deadlines, a greater preference for the pressure of doing work at the last minute, and an increased satisfaction with the consequences of doing work near to a deadline. In contrast, the value students expressed for the material they were learning did not have a strong relation with any measure of students' traditional or active procrastination. In line with earlier work (Chu and Choi 2005; Ferrari et al. 1992; Tuckman 1991; Wolters 2003), this pattern suggests that students' engagement in various dilatory behaviors is not a function of whether they see the work or the expected outcomes as useful or important but rather is linked to whether they believe they will be able to complete the work successfully.

Traditional versus active procrastination

Researchers have proposed and studied a number of different types of procrastination (Grunschel et al. 2013; Ferrari 2004; Klingsieck 2013; Steel 2007). Of particular interest to those who study SRL, some researchers have argued that putting off academic work in a more deliberate or goal directed fashion represents a distinct form of procrastination that is consistent with SRL and with adaptive academic functioning more broadly (Choi and Moran 2009; Chu and Choi 2005; Schraw et al. 2007). In practice, active procrastination is characterized by increased intentional delays, along with increased ability to meet deadlines, affinity for the pressure of working at the last minute, and satisfaction with the outcomes one experiences when completing work under these conditions (Choi and Moran 2009). Although not a central aim, our findings provide insight into the need to differentiate between dilatory behaviors that are passive from those that are more intentional and goal directed.

First, we found limited support for the proposition that active procrastination represents a substantially unique construct in comparison to more traditional views of procrastination. Intentional delay and especially the ability to meet deadlines were both strongly correlated with the more traditional measure of procrastination developed by Steel (2007). These three measures also exhibited a similar pattern of correlations with the various aspects of time management and SRL we examined.[3] Finally, setting goals and priorities and preference for organization served as the strongest individual predictors for all three behavioral indicators of students' procrastination. In short, our findings do little to indicate that either the ability to meet deadlines or the intentional decision to delay scales assess a construct that is markedly distinct from procrastination as reflected by Steel's pure procrastination scale. A central shared element assessed by each of these three measures, evident by an inspection of the individual items, is students' tendency to delay completing their academic work and ultimately to submit work after its assigned due dates.

Second, our findings also provide little reason to conclude that increased active procrastination is a manifestation of students' adaptive time management or SRL. It is true that students' who reported increased use of strategies for time management, metacognition and

[3] Although these relations have the opposite sign/valence for the ability to meet deadlines, the fact that this scale is constructed by reverse coding all four of the individual items makes this distinction trivial. It would be a simple, and perhaps well-justified, step to retain the original valence of these items and conceive of the resulting scale as the extent to which students expressed difficulty meeting deadlines. This change would result in a strong positive correlation with traditional procrastination, and a pattern of results that was substantially equivalent.

motivation also tended to report increased ability to finish work and to meet deadlines. Given its substantial overlap with traditional procrastination, however, these relations with the ability to meet deadlines add little beyond showing that time management and SRL are inconsistent with putting off academic work or not completing work by the prescribed deadline. In addition, and perhaps more importantly, evidence of increased time management and SRL represented by setting goals and priorities, preference for organization, and self-efficacy was associated with lower levels of intentional delay. Hence, deliberately putting off the start of an academic task as a motivational or time management tactic appeared incongruent with more typical adaptive aspects of SRL. In line with some previous work (Corkin et al. 2011; Hensley 2014), therefore, our finding suggests that intentional delay and active procrastination generally have more in common with traditional forms of passive procrastination than with the purposeful and adaptive behaviors represented by SRL.

Implications for practice

Our findings provide implications for practitioners and policymakers who want to help students be more academically successful. Efforts to improve time management are one of the most common academic supports provided to college students (Truschel and Reedy 2009; Young and Hopp 2014). Our findings support the utility of these efforts as a potential mechanism for reducing procrastination, one prototypical self-handicapping behavior known to impede academic performance. Adding to these efforts, our findings suggest two viable intervention routes that might be used to reduce students' academic procrastination. First, promoting students' understanding and increased use of strategies for time management, especially setting goals and priorities, may lead to reduced procrastination. Our empirical support for this pathway establishes a connection that, heretofore, many practitioners devising academic interventions have simply taken as a given. These findings also are consistent with the broader assumption that students who self-regulate when and for how long they do academic work will improve their academic performance by avoiding unnecessary and maladaptive delays (Bembenutty 2011; Dembo and Eaton 2000; Kitsantas et al. 2008).

Second, our findings highlight a potentially important motivational pathway that might also be used to inhibit students' tendency to procrastinate. In particular, our findings suggest that increasing the perceived usefulness students' have for using a schedule and being organized about their time may ultimately benefit their academic engagement, learning and performance. We found that students with more favorable attitudes about time management also tended to report using various regulatory strategies more often. More importantly, these favorable attitudes were associated with decreased levels of both traditional and more intentional forms of procrastination even when accounting for actual reported strategy use. Hence, simply believing more firmly that being organized and actively managing one's time is worthwhile may be a necessary part of students' efforts to avoid engaging in dilatory behaviors. The importance of these beliefs are consistent with earlier research showing that students' tendency to use effective information processing strategies may be limited unless they also have the necessary metacognitive knowledge regarding when and under what conditions those strategies are most useful (Pressley and Harris 2006). Future research that further explores the distinction and interdependence of students' strategic knowledge about how to manage their time and their beliefs about the usefulness of enacting those strategies is needed.

Limitations and conclusion

Our findings and the conclusions they support must be understood in the context of at least two notable limitations. One limitation is our reliance on self-report data. Although very common, self-report instruments have well-known weaknesses when used to assess SRL and other similar processes (Winne and Perry 2000). In particular, this method has been criticized because it overstates the stability of constructs across specific events or situations. As a result, self-report surveys may be more appropriate when assessing students' beliefs, attitudes and behaviors that are viewed as more domain general. This assumption holds when considering time management and procrastination, but is less tenable when considering students' use of metacognitive strategies, self-efficacy, or task value. Examining the connection between time management, procrastination and other aspects of SRL within the context of more specific or short-term episodes of learning using other forms of data (e.g., observational, trace) represents an obvious path for future research.

A second noteworthy limitation is that, because we were unable to include a measure of achievement, this study does not provide any direct evidence as to whether SRL, time management or procrastination are associated with students' academic performance. Certainly, prior studies have provided strong support for these links, especially the connection between procrastination and decreased performance (Ferrari 2004; Pychyl et al. 2000; Tice and Baumeister 1997). Still, additional research that examines a model of students' achievement as a joint function of their motivational beliefs, use of learning strategies, time management, and even procrastination would be beneficial.

Despite these limitations, our findings indicate that a model of SRL that incorporates time management provides a viable framework for understanding college students' academic procrastination. This conclusion is in line with the contention that SRL, and perhaps especially time management, must be considered among the growing array of non-cognitive factors that are increasingly recognized as critical influences on college students' academic success and personal well-being and therefore an important area of continued research. (Crede and Kuncel 2008; Duckworth and Yeager 2015; Heckman and Kautz 2012; Robbins et al. 2004; Schmitt 2012).

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest pertaining to this study or manuscript. As well, the research reported here was conducted in accordance with the ethical guidelines of the American Psychological Association.

References

Ackerman, D. S., & Gross, B. L. (2005). My instructor made me do it: Task characteristics of procrastination. *Journal of Marketing Education, 27*, 5–13.

Adams, G. A., & Jex, S. M. (1999). Relationships between time management, control, work–family conflict, and strain. *Journal of Occupational Health Psychology, 4*, 72–77.

Albaili, M. (2010). Differences among low-, average- and high-achieving college students on learning and study strategies. *Educational Psychology, 17*, 171–177.
Bembenutty, H. (2009). Academic delay of gratification, self-efficacy, and time management among academically unprepared college students. *Psychological Reports, 104*, 613–623.
Bembenutty, H. (2011). Meaningful and maladaptive homework practices: The role of self-efficacy and self-regulation. *Journal of Advanced academics, 22*, 448–473.
Boekaerts, M. (1996). Coping with stress in childhood and adolescence. In M. Zeidner & N. S. Endler (Eds.), *Handbook of coping: Theory, research, and applications* (pp. 452–484). New York: Wiley.
Bond, M. J., & Feather, N. T. (1988). Some correlates of structure and purpose in the use of time. *Journal of Personality and Social Psychology, 55*, 321–329.
Britton, B. K., & Tesser, A. (1991). Effects of time management and practices on college grades. *Journal of Educational Psychology, 83*, 405–410.
Burlison, J. D., Murphy, C. S., & Dwyer, W. O. (2009). Evaluation of the motivated strategies for learning questionnaire for predicting academic performance in college students of varying scholastic aptitude. *College Student Journal, 43*, 1313–1323.
Burrus, J., Jackson, T., Holtzman, S., Roberts, R., & Mandigo, T. (2013). Examining the efficacy of a time managment intervention for high school students. *ETS Research Report Series, 2013*(2), i–35.
Burt, C. B., Weststrate, A., Brown, C., & Champion, F. (2010). Development of the time management environment (TiME) scale. *Journal of Managerial Psychology, 25*, 649–668.
Cao, L. (2012). Examining "active" procrastination from a self-regulated learning perspective. *Educational Psychology, 32*, 515–545.
Chang, A., & Nguyen, L. T. (2011). The mediating effects of time structure on the relationships between time management behavior, job, satisfaction, and psychological well-being. *Australian Journal of Psychology, 63*, 187–197. doi:10.1111/j.1742-9536.2011.00008.x.
Choi, J. N., & Moran, S. V. (2009). Why not procrastinate? Development and validation of a new active procrastination scale. *The Journal of Social Psychology, 149*, 195–211.
Chu, A. H. C., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *The Journal of Social Psychology, 145*, 245–264.
Claessens, B. C., van Eerde, W., Rutte, C. G., & Roe, R. A. (2007). A review of the time management literature. *Personnel Review, 36*, 255–276.
Corkin, D. M., Yu, S. L., & Lindt, S. F. (2011). Comparing active delay and procrastination from a self-regulated learning perspective. *Learning and Individual Differences, 21*, 602–606.
Crede, M., & Kuncel, N. (2008). Study habits, skills, and attitudes: the third pillar supporting collegiate academic performance. *Perspectives on Psychological Science, 3*, 425–453.
Dembo, M. H., & Eaton, M. J. (2000). Self-regulation of academic learning in middle-level schools. *The Elementary School Journal, 100*, 473–490.
Duckworth, A., & Yeager, D. (2015). Measurement matters: assessing personal qualities other than cognitive ability for educational purposes. *Educational Researcher, 44*, 237–251.
van Eerde, W. (2000). Procrastination: Self-regulation in initiating aversive goals. *Applied Psychology: An International Review, 49*, 372–389.
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.
Ferrari, J. R. (2004). Trait procrastination in academic settings: An overview of students who engage in task delays. In H. Schouwenburg, C. Lay, T. Pychyl, & J. Ferrari (Eds.), *Counseling the procrastinator in academic settings*. Washington, DC: American Psychological Association.
Ferrari, J. R., & Diaz-Morales, J. F. (2007). Perceptions of self-concept and self-presentation by procrastinators: Further evidence. *Spanish Journal of Psychology, 10*, 91–96.
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., Diaz-Morales, J., O'Callaghan, J., Diaz, K., & Argumedo, D. (2007). Frequent behavioral delay tendencies by adults: International prevalence rates of chronic procrastination. *Journal of Cross-Cultural Psychology, 38*, 458–464.
Grunschel, C., Patrzek, J., & Fries, S. (2013). Exploring different types of academic delayers: a latent profile analysis. *Learning and Individual Differences, 23*, 225–233.
Hafner, A., Stock, A., Pinneker, L., & Strohle, S. (2013). Stress prevention through a time management training intervention: an experimental study. *Educational Psychology, 34*, 403–416.
Heckman, J., & Kautz, T. (2012). Hard evidence on soft skills. *Labour Economics, 19*, 451–464.
Hensley, L. C. (2014). Reconsidering active procrastination: Relations to motivation and achievement in college anatomy. *Learning and Individual Differences, 36*, 157–164.

Howell, A. J., & Watson, D. C. (2007). Procrastination: Associations with achievement goal orientation and learning strategies. *Personality and Individual Differences, 43*, 167–178.
Kesici, Ş., Baloğlu, M., & Deniz, M. (2011). Self-regulated learning strategies in relation with statistics anxiety. *Learning and Individual Differences, 21*, 472–477.
Kim, E., & Seo, E. H. (2013). The relationship of flow and self-regulated learning to active procrastination. *Social Behavior and Personality: An International Journal, 41*, 1099–1113.
Kitsantas, A., Winsler, A., & Huie, F. (2008). Self-regulation and ability predictors of academic success during college: A predictive validity study. *Journal of Advanced Academics, 20*, 42–68.
Klingsieck, K. (2013). Procrastination: When good things don't come to those who wait. *European Psychologist, 18*, 24–34.
Knaus, W. (2000). Procrastination, blame, and change. *Journal of Social Behavior and Personality, 15*, 153–166.
Koch, C. J., & Kleinmann, M. (2002). A stitch in time saves nine: Behavioural decision-making explanations for time management problems. *European Journal of Work and Organizational Psychology, 11*, 199–217. doi:10.1080/13594320244000120.
Lay, C. H., & Schouwenburg, H. C. (1993). Trait procrastination, time management, and academic behavior. *Journal of Social Behavior and Personality, 8*, 647–662.
Lynch, D. (2006). Motivational factors, learning strategies, and resource management as predictors of course grades. *College Student Journal, 40*, 423–428.
Lynch, D. (2010). Motivational beliefs and learning strategies as predictors of academic performance in college physics. *College Student Journal, 44*, 920–927.
Macan, T. (1994). Time management: Test of a process model. *Journal of Applied Psychology, 79*, 381–391.
Macan, T., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology, 82*, 760–768.
Macan, T., Gibson, J., & Cunningham, J. (2010). Will you remember to read this article later when you have time? The relationship between prospective memory and time management. *Personality and Individual Differences, 48*, 725–730.
Meece, J., & Painter, J. (2008). Gender, self-regulation, and motivation. In D. Schunk & B. Zimmerman (Eds.), *Motivation and self-regulated learning. Theory, research, and applications* (pp. 339–368). New York: Lawrence Erlbaum Associates.
Park, S. W., & Sperling, R. (2012). Academic procrastinators and their self-regulation. *Psychology, 3*, 12–23.
Pintrich, P., & Zusho, A. (2007). Students' motivation and self-regulated learning the college classroom. In R. P. Perry & J. C. Smart (Eds.), *The scholarship of teaching and learning in higher education: An evidence based perspective* (pp. 731–810). New York: Springer.
Pintrich, P., Smith, D., Garcia, T., & McKeachie, W. (1993). Predictive validity and reliability of the motivated strategies for learning questionnaire (MSLQ). *Educational and Psychological Measurement, 53*, 801–813.
Pressley, M., & Harris, K. (2006). Cognitive strategies instruction: From basic research to classroom instruction. In P. Alexander & P. Winne (Eds.), *Handbook of educational psychology* (2nd ed., pp. 265–286). Mahwah: Erlbaum Publishers.
Pychyl, T. A., Lee, J. M., Thibodeau, R., & Beck, A. (2000). Five days of emotion: An experience sampling study of undergraduate student procrastination. *Journal of Social Behavior and Personality, 15*, 239–254.
Robbins, S., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin, 130*, 261–288.
Schmitt, N. (2012). Development of rationale and measures of noncognitive college student potential. *Educational Psychologist, 47*, 18–29.
Schouwenburg, H. C., Lay, C. H., Pychyl, T. A., & Ferrari, J. R. (Eds.). (2004). *Counseling the procrastinator in academic settings*. Washington, DC: American Psychological Association.
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.
Seo, E. H. (2013). A comparison of active and passive procrastination in relation to academic motivation. *Social Behavior and Personality: An International Journal, 41*, 777–786.
Shahani, C., Weiner, R., & Streit, M. K. (1993). An investigation of the dispositional nature of the time management construct. *Anxiety, Stress, and Coping, 6*, 231–243.
Solomon, L., & Rothblum, E. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology, 31*, 503–509.
Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin, 133*, 65–94.
Steel, P. (2010). Arousal, avoidant and decisional procrastinators: Do they exist? *Personality and Individual Differences, 48*, 926–934.
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.

Truschel, J., & Reedy, D. L. (2009). National survey: What is a learning center in the 21st century? *The Learning Assistance Review, 14*, 9–22.

Tuckman, B. W. (1991). The development and concurrent validity of the procrastination scale. *Educational & Psychological Measurement, 51*, 473–480.

Winne, P., & Hadwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in educational theory and practice* (pp. 279–306). Hillsdale: Erlbaum.

Winne, P., & Perry, N. (2000). Measuring self-regulated learning. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 531–566). San Diego: Academic.

Wolters, C. (2003). Understanding procrastination from a self-regulated learning perspective. *Journal of Educational Psychology, 95*, 179–187.

Wolters, C., & Benzon, M. (2013). Assessing and predicting college students' use of strategies for the self-regulation of motivation. *Journal of Experimental Education, 18*, 199–221.

Young, D. G., & Hopp, J. M. (2014). 2012-2013 *National Survey of First-Year Seminars: Exploring high-impact practices in the first college year* (Research Reports on College Transitions, No. 4). Columbia, SC: University of South Carolina, National Resource Center for the First-Year Experience & Students in Transition.

Zimmerman, B. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self–regulation: Theory, research, and applications* (pp. 13–29). San Diego: Academic Press.

Zimmerman, B., Greenberg, D., & Weinstein, C. (1994). Self-regulating academic study time: A strategy approach. In D. Schunk & B. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 181–199). Hillsdale: Lawrence Erlbaum Associates, Inc.