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Procrastination and self-efficacy: Tracing vicious and virtuous circles in self-regulated learning

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ABSTRACT

In the present study, we investigated how students react to self-assessed low goal achievement in self-regulated learning. Over a university term (19 weeks), 150 university students recorded self-efficacy, procrastination and perceived goal achievement in weekly web-based self-monitoring protocols. Using multilevel analyses for growth curve models, we investigated the reciprocal amplifying between procrastination and perceived goal achievement and self-efficacy and perceived goal achievement. Results indicated a vicious circle of procrastination and a virtuous circle of self-efficacy. Students who recorded high levels of procrastination assessed their goal achievement as being low. As a consequence of low goal achievement, they reinforced procrastination. Students who recorded high levels of self-efficacy assessed their goal achievement as being high. As a consequence of high goal achievement, self-efficacy increased. Self-efficacy mediated the effect of perceived goal achievement on procrastination. Thus, students with low perceived self-efficacy are vulnerable for finding themselves in a vicious circle of procrastination.

1. Introduction

Although even very young children are able to self-regulate their learning processes to some extent (e.g., Perels, Merget-Kullmann, Wende, Schmitz, & Buchbinder, 2009), in general, self-regulated learning is a demanding task for many learners. Self-regulated learning requires considerable knowledge about how to instruct and regulate oneself effectively (Schraw, 1998). Furthermore, it is indispensable that learners not only *know* about how to learn, but really *use* self-regulation strategies adaptively to succeed in their learning process (Mayer, 2002; Weinstein & Mayer, 1986; Zimmerman, 2008a). These strategies encompass cognitive, metacognitive, motivational and behavioral strategies (Pintrich, 2004). Vermunt and Vermetten (2004) stated that a lack of regulation occurs when students possess insufficient strategies for regulating their learning processes and insufficient external support is made available to them. At the university level, external support is typically limited to setting some deadlines for students (such as exam dates or deadlines for submissions of assignments). Thus, the ability of students to self-regulate should be even more important. A ubiquitous problem is students' delay of academic tasks until the last minute, that is, procrastination (Steel, 2007), which can be regarded as a failure-avoiding strategy (Helmke & van Aken, 1995). A classic counter-argument that students like to put forward to defend themselves against the criticism of procrastination is that learning is done best under pressure, and at any rate, that of course they are able to reduce their procrastination if it becomes really problematic. Thus, many students seem to believe that they are able to self-regulate effectively when it is required (Zimmerman, 2002).

In the present longitudinal study, we explored university students' self-regulation abilities over a whole term. Specifically, we investigated how procrastination affects self-regulated learning, to what extent procrastination tends to reinforce itself in a vicious circle as a result of low goal achievement, and to what extent the perception of self-efficacy might result in a virtuous circle that helps the students overcome the tendency to procrastinate.

In this article, we use the term procrastination to denote irrational postponing of important learning tasks. A distinction should be made between trait and state procrastination, because actual postponing (state procrastination) is influenced by a personal tendency to delay tasks (trait procrastination), situational aspects and self-regulation strategies (Steel, 2007). The results of Steel's meta-analysis showed that trait procrastination is stable across

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situations and over a longer time span. Nevertheless, there is also empirical evidence that postponing can be influenced by contextual aspects, for example task attributes (e.g., aversive, complicated, boring). Learners who were asked to solve tasks associated with low autonomy and low personal utility were more likely to procrastinate (Lonergan & Maher, 2000). Strategies for self-regulation are generally expected to mediate the effect of personal (e.g., trait procrastination) and contextual characteristics (e.g., task characteristics) on learning behavior (Pintrich, 2004; Vermetten, Vermunt, & Lodewijks, 1999). Thus, a personal tendency to procrastinate does not necessarily need to result in actual postponing. A medium correlation of $r = .51$ (Stainton, Lay, & Flett, 2000) indicates that trait and state procrastination are indeed related but not quite the same. Hence, strategies of self-regulation may in fact compensate for a personal tendency to procrastinate. On the other hand, deficits in self-regulation could then result in procrastination that interferes with goal achievement (Steel, 2007). Thus, we theoretically assume a reciprocal amplifying effect between procrastination and goal achievement. Bandura (1978) coined the term reciprocal determinism to denote that psychological functioning involves reciprocal interactions between behavioral, cognitive and environmental factors.

1.1. How procrastination sustains itself

Previous studies on procrastination identified numerous correlates of procrastination that are important components of self-regulated learning and strongly related to learning success, for example goal setting (e.g., Steel, 2007) and cognitive strategy use (e.g., Howell & Watson, 2007). Goal setting is indeed a linchpin in self-regulated learning (Locke & Latham, 2002; Zimmerman, 2008b). Goal setting differs from students' goal orientation in that goal orientation focuses on the reasons for engaging in academic tasks (i.e., to learn or perform), whereas goal setting focuses on the self-regulatory act of setting a specific goal anchored in context and time (Eccles & Wigfield, 2002; Zimmerman, 2008b). Goal setting enables learners to plan their learning processes (Boekaerts, 2011; Efklides, 2011; Zimmerman, 2008b). Self-set learning goals help learners to decide which learning strategies are beneficial and how much effort they need to invest. Furthermore, self-set learning goals enable learners' self-reflection of goal achievement. Hence, goal setting is an important strategy self-regulated learners use to guide their learning process (self-regulation as a top-down, goal directed regulation; Efklides, 2011). There is considerable evidence that learning goals guide learners' selection of cognitive strategies and their self-reflection on goal achievement (Locke & Latham, 2002; Schunk, 2001; Winne & Hadwin, 1998). When thinking about appropriate learning goals, it is not only important for learners to think about how, but also why to achieve a learning goal. Therefore, learning goals that reflect reasons such as personal utility (i.e., why a content is relevant) or mastery (i.e., being able to understand or to do something) help learners to start a task and to persist on the task, expending great effort in meeting the requirements (Assor, Kaplan, & Roth, 2002; Belenky & Nokes-Malach, 2012; Wigfield, Eccles, Roeser, & Schiefele, 2008). Taken together, appropriate learning goals can support self-regulated learning and prevent deficits in motivation (Hofer, Schmid, Fries, Kilian, & Kuhnle, 2010; Seo, 2009).

A problem related to procrastination is deficient cognitive strategy use (Howell & Watson, 2007). Learning strategy researchers typically distinguish between surface and deep learning strategies (Leutner & Leopold, 2003; Marton & Saljö, 1997). Following Weinstein and Mayer (1986), cognitive strategies can be categorized into organization, elaboration, and rehearsal strategies. Rehearsal strategies mainly refer to the repetition of information in order to support refreshment and retention in memory. Rehearsal strategies rather support superficial information processing and can therefore be regarded as lower in quality than organization and elaboration strategies (Leutner & Leopold, 2003). Organization strategies include, for example, identifying the main concepts of the newly learned contents as well as the structuring of the concepts (e.g., identifying the main concepts and relating them to each other in a map). Elaboration strategies connect the learning contents with a learner's prior knowledge (constructing examples and analogies, for example). Due to their role in the process of knowledge construction (see Mayer, 2010), organization and elaboration strategies are regarded as deep learning strategies that facilitate the enduring integration of learning content into existing cognitive representations by changing or complementing them, thereby allowing for flexible use of knowledge (Mayer, 2002).

Several empirical studies showed that procrastination is indeed negatively related to the extent of cognitive strategy use. In a study by Howell and Watson (2007), self-reported use of cognitive learning strategies proved to be a strong predictor of procrastination that remained stable even when controlling for motivational trait variables, such as achievement goal orientations (i.e., mastery approach and mastery avoidance orientations, see Elliot & McGregor, 2001). In the study by Wolters (2003), the results were somewhat less clear, as the negative relation between cognitive strategy use and procrastination disappeared when work avoidance (i.e., another type of achievement goal orientation) and perceived self-efficacy (see Subsection 1.2) were introduced as additional predictors of procrastination. Given that Howell and Watson, as well as Wolters, used cross-sectional designs by regressing procrastination on predictors such as reported cognitive strategy use and perceived self-efficacy, a more process-oriented analysis of how procrastination, learning goals, cognitive strategy use and self-efficacy affect each other was not possible. Therefore, analyzing the interplay of these variables using a longitudinal study design could be illuminative.

Inasmuch as extensive procrastination is associated with non-optimal use of learning strategies, and deep learning strategies in particular, procrastination has also been found to impair students' learning outcomes (Klassen, Krawchuk, & Rajani, 2008; Lay & Schouwenburg, 1993; Tice & Baumeister, 1997). As a consequence, in cases of substantial state procrastination, the extent of having achieved one's learning goals should be reduced in students' self-perceptions. Moon and Illingworth (2005) conducted growth curve analyses to model the effect of the course of procrastination on academic performance as measured by five multiple-choice tests in introductory psychology courses. The results showed that measures of state procrastination were significant predictors of academic performance. Similar results were, for example, found in longitudinal analyses conducted by Tice and Baumeister (1997), who showed that procrastination had negative effects on students' grades. Given these results, we wondered whether procrastination is also related to a student's self-reflection of goal achievement. This self-reflection informs students about whether they have achieved their learning goals or whether adaptations of learning activities are necessary. Thus, perceived goal achievement is an important reference for students that helps them to regulate their learning process. Furthermore, we were interested in whether it would be possible to detect reciprocal amplifying of procrastination and perceived goal achievement. Thus, we were interested in whether students who perceive their goal achievement as rather low are able to regulate themselves by reducing procrastination, or whether they continue or even reinforce procrastination. Students who continue or reinforce procrastination after low goal achievement would be at particular risk of becoming involved in a vicious circle of procrastination.