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Development and validation of the brief regulation of motivation scale

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ABSTRACT

The purpose of this study was to develop and establish evidence supporting the validity of a brief scale designed to assess college students' regulation of motivation. This scale, titled the Brief Regulation of Motivation Scale, is more manageable to administer and intuitive to interpret compared to previous lengthy multidimensional scales. With a sample of 396 college students, multiple sources of validity evidence were examined. Exploratory and confirmatory analyses supported two separate factors subsequently titled regulation of motivation and willpower. The patterns of correlations between the two factors and critical aspects of self-regulated learning (e.g., motivation, learning strategies) were consistent with theoretical expectations. Only the regulation of motivation factor successfully predicted students' reported use of cognitive and metacognitive strategies and their procrastination. Overall, we found stronger support for the validity of regulation of motivation scale, by itself, as an indicator of students' general tendency to self-regulate their motivation.

1. Introduction

Students are often faced with motivational challenges while completing academic activities. Students may perceive required tasks as irrelevant, boring, and/or difficult. A large and still growing body of evidence suggests that students' ability to respond productively and persist in the face of these challenges can have an important impact on their learning and achievement (Boekaerts, 1997; Cooper & Corpus, 2009; Corno, 2001; Duckworth, 2016; Wolters, 2003). Regulation of motivation, or students' active efforts to sustain or enhance their own motivation (Wolters, 2003), represents one key self-regulatory process that has proven useful for understanding these effects. Students might regulate their motivation using a variety of strategies. For example, students may provide rewards for themselves or change their surroundings to increase or sustain their motivation on a particular task (Wolters, 2003).

The growing recognition of regulation of motivation as an important self-regulatory process highlights the need for rigorous assessments. At this point, however, few instruments are available for assessing the regulation of motivation (e.g., Schwinger, von der Laden, & Spinath, 2007; Wolters & Benzon, 2013) and the characteristics of these instruments constrain their usefulness with regard to some research purposes. Our goal was to offer a new tool for the assessment of regulation of motivation by developing and evaluating a shorter self-report instrument that provides a global and contextually sensitive indication of students' regulation of motivation.

1.1. Understanding regulation of motivation

Self-regulated learning is a purposeful, autonomous, and strategic process that learners can engage in while completing academic activities (Pintrich & Zusho, 2007; Wolters, 2003; Zimmerman, 2000). According to Pintrich's (2004) framework, students can plan, monitor, control, and regulate four inter-related aspects of their learning including motivation, cognition, behavior, and context. The regulation of motivation, or motivational regulation, represents one essential aspect of self-regulated learning (Pintrich, 2004; Winne & Hadwin, 2012; Wolters, 2003). Despite its presumed importance, previous research has tended to focus on the cognitive and metacognitive aspects of self-regulated learning, leaving much room for investigations focused on how students may monitor and control their own motivation.

Still, regulation of motivation has received increasing attention since Wolters (1998) identified several strategies that college students use to regulate their motivation. In an effort to enhance or maintain their motivation, students can deliberately manage their motivation when faced with motivational challenges (Cooper & Corpus, 2009; Wolters, 2003). Wolters and Benzon (2013) suggested that students may use various strategies to sustain or enhance their motivation for completing academic tasks.

Considering the numerous motivational challenges students encounter, monitoring and regulating motivation can have a critical influence on their learning and achievement. Although the empirical research in this area is still young, researchers have found increased use

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of regulation of motivation strategies to be associated positively with the use of cognitive and metacognitive strategies (Schwinger et al., 2007; Wolters, 1999b; Wolters & Benzon, 2013). In addition, students' reported use of regulation of motivation strategies has been associated positively with indicators of choice, effort, and persistence (Cooper & Corpus, 2009; Pintrich, 2004; Schwinger, Steinmayr, & Spinath, 2012; Wolters, 2003; Wolters & Benzon, 2013; Zimmerman, 2000).

1.2. Assessing regulation of motivation

Considering its significance to self-regulated learning and its connection to their academic engagement and success, researchers have worked to develop valid assessments of students' regulation of motivation. These assessments have primarily consisted of self-report instruments designed to tap into an array of distinct regulation of motivation strategies (e.g., Schwinger et al., 2007; Wolters & Benzon, 2013). For instance, Wolters (1998, 1999a, 1999b) first developed a self-report instrument assessing college students' reported use of five regulation of motivation strategies. More recently (Wolters & Benzon, 2013), this instrument was revised to be a 30-item scale that differentiated six regulation of motivation strategies including regulation of value, regulation of performance goals, self-consequating, environmental structuring, and regulation of situational interest. Additionally, the items from Wolters (1999b) have served as the basis for at least two similar instruments. Schwinger et al. (2007) developed a 30-item German instrument that distinguished between eight regulation of motivation strategies, adding proximal goal setting and performance-avoidance self-talk to the strategies originally identified by Wolters (1999a, 1999b). Similarly, Gonzalez, Dowson, Brickman, and McInerney (2006) created a 35-item scale that assessed seven regulation of motivation strategies, which were similar to the dimensions suggested by Wolters (2003).

1.3. Limitations of the existing instruments

Given their common source, the existing instruments share three features that limit their usefulness for some purposes. First, the instruments are lengthy, each containing 30 to 35 items (e.g., Schwinger et al., 2007; Wolters & Benzon, 2013). This is in contrast to scales developed to assess other self-regulation strategies used by students. For example, the most common instrument used to assess cognitive and metacognitive strategies among college students includes just 19 and 12 items respectively (Pintrich, Smith, García, & McKeachie, 1993). Lengthy instruments can be unnecessarily burdensome, time-consuming, and expensive to administer when assessing regulation of motivation as part of an array of variables needed to test complex structural models.

Second, each of the existing instruments was designed to produce multiple indicators of students' reported use of specific types of strategies for the regulation of motivation. For instance, the instruments generate six to eight dimensions, each representing a different type of strategy for regulating motivation (e.g., Schwinger et al., 2007; Wolters & Benzon, 2013). Multidimensional instruments that assess an array of different motivational strategies are necessary for some purposes. For instance, these assessments allow researchers to study whether particular strategies are related to other aspects of self-regulated learning or achievement (Schwinger, Steinmayr, & Spinath, 2009; Wolters & Benzon, 2013). However, research that seeks to understand potential influences on students' *overall* level of regulation of motivation, may be disadvantaged by instruments that produce up to eight separate indicators of regulation of motivation. A more parsimonious scale that demands less time to administer and produces a single general indicator of regulation of motivation would expand the tools that researchers have available, providing possibilities for the study of additional theoretical questions.

A third characteristic that limits the usefulness of existing instruments is rooted in the way that these instruments contextualize students' responses. Students' achievement motivation is contingent, at least in part, on contextual influences (Pintrich & Zusho, 2007). Similarly, students' engagement in regulation of motivation is a function of the particular problems, obstacles, or setbacks they experience within a given context (Engelschalk, Steuer, & Dresel, 2016; Hadwin & Oshige, 2011; Winne & Hadwin, 1998; Wolters, 2003). Further, the responses students provide to any self-report instrument are dependent on their accurate recall and thoughtful consideration of experiences relevant to the item prompt (Duckworth & Yeager, 2015). Both recall and consideration are subject to various biases that can distort students' responses (Veenman, 2011). The overall validity of any assessment of students' regulation of motivation, therefore, is contingent on its ability to invoke appropriate episodes for students to consider when formulating their responses in ways that might help to minimize these biases. The most common existing instruments address this need to contextualize students' responses by activating situational cues in the instructions of the instruments. For instance, instructions ask students to think about or recall experiences in which they did not feel motivated (Schwinger et al., 2007; Wolters, 1998; Wolters & Benzon, 2013). This approach can be criticized because it provides too much variance in the type of situation that students recall. As well, it may be insufficient for capturing the breadth of situations or problems that require students to engage in regulation of motivation. An instrument that assesses students' general tendency to deliberately manage their own motivation in response to a larger set of motivational obstacles would allow students an opportunity to contextualize their regulation of motivation, thus answering items more accurately.

1.4. Present study

The goal of the present study was to construct and evaluate a new instrument for assessing regulation of motivation that avoided the structural limitations of existing instruments. More specifically, we set out to develop a brief instrument that would produce a unidimensional indicator of students' general tendency to regulate their motivation. In service of this goal, we wanted an assessment that would contextualize students' responses to a wider variety of motivational obstacles that they face when completing academic work. In this study, we evaluated the Brief Regulation of Motivation Scale (BRoMS) with regard to three core aspects of validity (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 2014). First, we used exploratory and confirmatory factor analyses to examine the evidence of internal structure. We hypothesized that the new scale would be unidimensional. Second, we evaluated the evidence based on relations with conceptually related variables by conducting correlational analyses. We hypothesized that the BRoMS would be positively related to students' grit and their achievement goals, value, and self-efficacy for self-regulated learning. Third, we assessed the evidence based on relations with criteria by examining whether scores from the new instrument would predict other strategies and procrastination. We hypothesized that higher scores on BRoMS would predict reportedly higher use of cognitive and metacognitive strategies and lower procrastination tendencies.

2. Method

2.1. Participants

Participants were students (N = 396) from a large Midwestern university in the US enrolled in a 3-credit hour, letter-graded semester-long, learning-to-learn course (223 males, 56%). The average age of the participants was 20.4 years (SD = 2.7) and included 74 freshmen, 121 sophomores, 91 juniors, and 84 seniors. Based on academic records, most participants were categorized as White (62.9%), African American