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Self-regulation, motivation, and math achievement in middle school: Variations across grade level and math context☆

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Abstract

The current study examined grade level, achievement group, and math-course-type differences in student self-regulation and motivation in a sample of 880 suburban middle-school students. Analysis of variance was utilized to assess group differences in student self-regulation and motivation, and linear regression analysis was used to identify variables that best predicted students' use of regulatory strategies. A key finding was that although seventh graders exhibited a more maladaptive self-regulation and motivation profile than sixth graders, achievement groups in seventh grade (high, moderate, low) were more clearly differentiated across both self-regulation and motivation than achievement groups in sixth grade. The pattern of achievement group differences also varied across math course type, as self-regulation and motivation processes more consistently differentiated achievement groups in advanced classes than regular math courses. Finally, task interest was shown to be the primary motivational predictor of students' use of regulatory strategies during math

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learning. The study highlights the importance of identifying shifting student motivation and self-regulation during the early middle school years and the potential role that context may have on these processes.

Keywords: Self-regulation strategies; Motivation; Learning context; Math achievement; Middle school

The middle school years represent a distinct developmental period whereby students are expected to develop a firm sense of self, establish and maintain a positive social support network, and effectively balance social, academic, and personal demands. For many students, the transition to middle school is a particularly daunting event because of the shift in emphasis from the supportive, mastery-based orientation typical of elementary schools to a performance-focused setting characterized by increased expectations for academic productivity, more intensive and teacher-directed instruction, and a greater focus on normative comparisons and high-stakes outcomes (Eccles et al., 1993; Midgley & Edelin, 1998; Schunk & Miller, 2002; Zimmerman, 2002). Furthermore, as students enter these grade levels, they are often called upon to complete more intensive or comprehensive assignments and projects, which require them to become more self-directed and regulated outside of school (Zimmerman, 2002). Examining student motivation and self-regulation is an important undertaking because these processes have consistently been shown to predict adaptive classroom and academic outcomes (Bandura, 1997; Butler, 1998; Eccles & Wigfield, 2002; Graham & Harris, 2005). The current study adds to the literature base by examining whether the importance of these processes relative to student math achievement varies across the early middle school years and level of math course.

Definition and features of self-regulated learning

Self-regulation is defined by social cognitive researchers as proactively initiated thoughts, feelings, and behaviors that are planned and cyclically adapted based on self-generated or performance feedback in order to attain personal goals (Zimmerman, 1989, 2000). It is a cyclical process in that feedback from prior task performance is used to evaluate and adjust one's methods of learning to optimize academic outcomes. This cyclical feedback loop consists of three sequential phases: forethought (i.e., processes that precede efforts to learn or perform), performance control (i.e., processes occurring during learning efforts), and self-reflection (i.e., processes occurring after learning or performance; Zimmerman, 2000). Embedded within each of these three phases are several inter-related sub-processes. For example, forethought involves processes that both guide and motivate learning such as goal-setting, strategic planning, and adaptive self-motivation beliefs such as high levels of task interest and perceived instrumentality. These forethought processes initiate a proactive, mindful approach to learning and influence students' behaviors during the performance control phase, such as implementing task-specific learning strategies, attention, and monitoring one's learning. Ultimately, the information that an individual gathers during the performance control phase is used by an individual to engage in self-reflection, including evaluating goal progress, identifying causes of the successes and failures, and deciding upon more adaptive courses of actions if one's goals were not attained.