Short report (original research)

The impact of adolescents' self-efficacy and self-regulated goal attainment processes on school performance — Do gender and test anxiety matter? ☆

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ABSTRACT

According to R. Schwarzer's theory of self-regulatory goal attainment processes (1998), self-efficacy beliefs have positive effects on motivational and volitional processes and the resulting performance. Test anxiety, on the other hand, is known to have detrimental effects on performance. To disentangle the complex relationships between trait test anxiety, self-efficacy, self-regulation processes, and school performance, this study tested the theory's predictions with a sample of adolescent German school students ($N = 783$). Students completed measures on goal setting, school-related self-efficacy, test anxiety, task persistence, effort investment, and current academic performance. Multigroup structural equation modeling was used to test for differences between boys and girls and between high and low test-anxious students in the interplay of these variables. Results indicated no gender differences, but revealed slight differences in the structural relations among these variables between students with high and low test anxiety. Implications for future research and educational practice are discussed.

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1 . Introduction

Since students have to cope with constant achievement pressure at school, it is of major interest for teachers and educational researchers to identify and strengthen those factors in students which primarily influence academic performance. Cognitive variables like self-efficacy beliefs (Schunk & Meece, 2005) and cognitive abilities seem to be the primary predictors of academic success (Gottfredson, 2003; Kuncel, Hezlett, & Ones, 2004), in addition to specific learning strategies (Busato, Prins, Elshout, & Hamaker, 2000; Hattie, Biggs, & Purdie, 1996; Vermunt, 2005). However, also emotions – in particular test anxiety – play an important role in educational settings, as they shape the interplay of dispositional control beliefs such as self-efficacy and self-regulated learning behavior on scholastic performance (Boekaerts, 2011; Pekrun, Goetz, Titz, & Perry, 2002; Zeidner & Matthews, 2005).

Despite vast empirical evidence for the importance of these performance predictors, little is known about the interplay of self-efficacy, self-regulation, performance, and test anxiety. Based on R. Schwarzer's theory of self-regulatory goal attainment processes (1998), the current study thus investigated associations among these key variables.

1.1. Self-efficacy, school performance, and self-regulation

A large body of evidence suggests that high self-efficacy beliefs have positive effects on self-regulation strategies and on academic performance in educational settings (e.g., Bandura, 1993; Bouffard-Bouchard, Parent, & Larivee, 1991; Huang, 2013; Lent, Brown, & Larkin, 1986; Multon, Brown, & Lent, 1991; Pajares, 1996a; Putwain, Sander, & Larkin, 2013; Schunk, 1995; Schunk & Meece, 2005). Self-efficacy refers to an individual's beliefs of being capable of dealing with difficult tasks or life events (Bandura, 1992, 1997) which in educational settings designates the conviction of being able to cope with school-related demands (Jerusalem & Satow, 1999; Patrick, Hicks, & Ryan, 1997; Putwain et al., 2013; Schunk, 1991).

Self-regulation characterizes "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the

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environment" (Pintrich, 2000, p. 453). Based on social cognitive theory, Schwarzer (e.g., 1998, 2001; Luszczynska & Schwarzer, 2005) introduced a self-regulatory goal attainment process framework known as HAPA (Health Action Process Approach), which specifies how self-efficacy beliefs shape and determine successful self-regulation and its behavioral outcomes. Numerous studies have documented its importance in understanding self-regulation in the context of health behavior (e.g., Schwarzer, 2008; Schwarzer et al., 2007), but no study to our knowledge has applied Schwarzer's framework to analyze the complex interplay of self-efficacy, self-regulation, and learning outcomes in educational settings.

Integrating existing research (for a review see Richardson, Abraham, & Bond, 2012; Robbins et al., 2004; Schunk & Meece, 2005) we adapted the model to educational settings by omitting outcome expectancy and risk perception. Firstly, when studying academic performance, there is a high overlap in conceptualization and measurement between goal-setting and outcome expectancy (e.g., Locke & Latham, 2002). Secondly, risk perception is only relevant for health-related contexts. For example, people might become aware of the risk for cardiovascular disease, elaborate about its consequences and form an intention to change their health behavior. Schwarzer (2008) argues that outcome expectancies are associated with risk perception as they balance the pros and cons of certain behavioral outcomes (e. g. "If I exercise five times a week, I will reduce my cardiovascular risk."). For school contexts, we considered these aspects as less important, because students do not necessarily need to change their behavior, but rather modulate the extent to which they use different strategies to reach performance goals. The modified model is depicted in Fig. 1.

During the two phases, self-efficacy is hypothesized to positively affect (1) the goal-setting (motivational phase), (2) the initiation, (3) the perseverance of related learning behavior, and (4) the academic performance as the behavioral outcome (volitional phase) (cf. Bandura, 1997; Schunk, 1995; Schwarzer, 1998, 2001).

For instance, when facing an upcoming exam, students enter the motivational phase, weigh alternative performance goals against each other, and finally decide on a goal that they want to achieve. Goal setting thus plays an important role in self-regulated learning, enables students to plan and initiate the individual learning process, and directly predicts better academic performance (Locke & Latham, 2002; Richardson et al., 2012; Robbins et al., 2004; Zimmerman, 2008). Students with high self-efficacy beliefs typically set higher goals, choose more challenging tasks and have greater visions of success (Bandura, 1992; Bouffard-Bouchard, 1990; Locke & Latham, 1990; Sexton & Tuckman, 1991; Zimmerman, 2008).

In the subsequent volitional phase, self-regulatory skills are needed to start the learning action and to keep it up despite barriers or (anticipated) failure. Examples of two important strategies are effort investment (amount of effort spent on a task) and persistence (perseverance in goal-oriented behavior despite accruing obstacles or aversive experiences; Schwarzer, 1998, 2001). The higher and/or more valuable a goal is for the learner, the more effort she/he will invest which in turn enhances persistence leading to better academic performance (Bouffard, Bouchard, Goulet, Denoncourt, & Couture, 2005; Locke & Latham, 2002). High self-efficacy beliefs positively influence effort investment (Bandura, 1992, 1997), enhance the monitoring of performance, lead to a greater persistence of behaviors that are important to achieve the task (Bouffard-Bouchard et al., 1991), and predict a better performance (Bouffard et al., 2005; Multon et al., 1991).

1.2. The role of test anxiety and gender on the relationships among self-efficacy, self-regulation and performance

According to Bandura (1997), state anxiety in performance situations is determined by the confidence with which students approach demands and learning activities at school. Low self-efficacy beliefs therefore evoke anxiety and decrease achievement (Mills, Pajares, & Herron, 2006). Across many studies, self-efficacy was found to be a stronger predictor of academic achievement than anxiety (e.g., Bandura, 1997; Britner & Pajares, 2001; Pajares & Graham, 1999; Pajares & Johnson, 1994, 1996; Pajares & Valiante, 2001). The most prevalent form of anxiety in educational contexts is test anxiety, which is considered as a situation-specific disposition to perceive performance-related evaluations as threatening and thus to respond with heightened state anxiety (Spielberger, Gonzales, Taylor, Algaze, & Anton, 1978; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005). Especially the cognitive component of test anxiety is usually found to have debilitating effects on performance measures (Cassady & Johnson, 2002; Chapell et al., 2005; Hembree, 1988; McDonald, 2001).

A large body of evidence supports a negative association between test anxiety and self-efficacy as well as effective self-regulation (Bandalos, Yates, & Thorndike-Christ, 1995; Bonaccio & Reeve, 2010; Hembree, 1988; Hill & Wigfield, 1984; Zohar, 1998): Since highly test-anxious students perceive difficult tasks as threatening, they often avoid setting high goals, put less effort into handling the task, show lower levels of persistence, and achieve lower academic performances (Hill & Wigfield, 1984).

However, empirical evidence for the combined influence of self-efficacy and achievement emotions, in particular test anxiety, on performance and self-regulation is scarce. In one study, Putwain and Daly (2013) found that a combination of high test anxiety and low self-efficacy beliefs led to lower performance, whereas highly self-efficient students with low to moderate test anxiety levels performed better. In another study, Putwain et al. (2013) found scholastic self-efficacy and achievement emotions to predict academic performance. They also found evidence for reciprocal relations between academic performance and emotions, but only for positive affect.
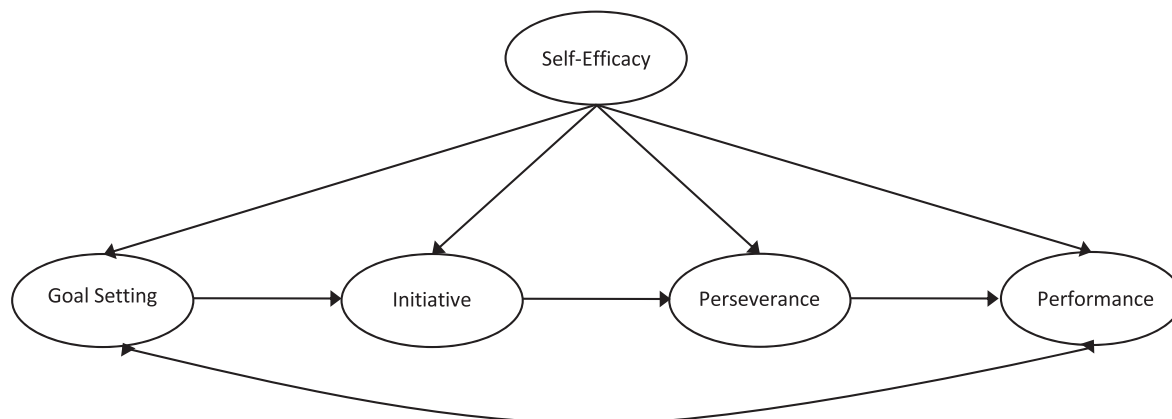

Fig. 1. Modified theory of self-regulatory goal attainment processes (see Schwarzer, 1998, 2001).