International Journal of Educational Research 83 (2017) 84–93

Contents lists available at ScienceDirect

International Journal of Educational Research

journal homepage: www.elsevier.com/locate/ijedures

Self-efficacy, test anxiety, and academic success: A longitudinal validation

Julia Roick*, Tobias Ringeisen

Merseburg University of Applied Sciences, Eberhard-Leibnitz-Str. 2, 06217 Merseburg, Germany

ARTICLE INFO

Article history:
Received 4 May 2016
Received in revised form 15 September 2016
Accepted 10 December 2016
Available online xxx

Keywords:
Academic self-efficacy
Test anxiety
Academic success
Examination importance

ABSTRACT

Control-value theory (CVT) specifies a sequence of variables assumed to predict achievement-related emotions, and related performance. Similarly, Schwarzer's theory of self-regulation (TSR) suggests that self-efficacy influences all links in the above-mentioned sequence. A longitudinal validation that integrates assumptions from both theories remains pending. Hence, the current study used a longitudinal design to validate the structure of anxiety predictors, thereby examining whether self-efficacy is associated with each link of the chain. A total of 92 students completed questionnaires at different time points before and after an oral examination. Using structural equation modeling, five separate models were run with stepwise involvement of the direct effects of self-efficacy on the other variables. Findings supported the proposed structure of relationships with self-efficacy affecting all variables.

1. Introduction

Since students have to cope with constant performance pressure, it is of major interest for teachers and educational researchers to identify and strengthen those factors in students which primarily influence academic performance. Aside from intellectual abilities, self-efficacy beliefs and achievement emotions like anxiety have been identified as two major determinants of academic performance (for an overview see e.g., Pajares, 1996; Richardson, Abraham, & Bond, 2012; Schunk & Meece, 2005; Zeidner, 1998). Achievement emotions are defined as emotions that arise in relation to achievement activities (e.g., learning behavior, effort investment, or task persistence) or subsequent outcomes (e.g., evaluations according to quality standards) (Pekrun & Stephens, 2012). In the context of examinations, test anxiety represents the most important achievement emotion. It is conceptualized as a situation-specific form of trait anxiety that predisposes the individual to perceive performance evaluations as threatening and thus respond with heightened state anxiety (Spielberger & Vagg, 1995; Zeidner, 2007). Many researchers consider test anxiety as a multidimensional construct consisting of cognitive (e.g., worrying about one's own performance and consequences of failure), bodily-affective (e.g., fast heartbeat associated with intense arousal), and behavioral manifestations (e.g., task-irrelevant behavior like avoidance) (Lowe et al., 2008; Zeidner, 1998, 2007).

According to Bandura (1997), state anxiety in performance situations is determined by confidence beliefs with which students approach demands and learning activities at school, known as self-efficacy. Low self-efficacy beliefs therefore evoke anxiety and decrease achievement (Mills, Pajares, & Herron, 2006). Self-efficacy is defined as individuals' beliefs in their own

* Corresponding author.
E-mail addresses: julia.roick@hs-merseburg.de (J. Roick), tobias.ringeisen@hs-merseburg.de (T. Ringeisen).

http://dx.doi.org/10.1016/j.ijer.2016.12.006
0883-0355/

ability to complete desired actions or to appropriately perform in specific situations which in educational settings designates the conviction of being able to successfully cope with performance-related tasks, or reach academic goals (Jerusalem & Satow, 1999; Pajares, 1996; Putwain, Sander, & Larkin, 2013). Extrapolating from Bandura (1997), different theories have conceptualized the interplay of self-efficacy beliefs, anxiety, and performance in the context of examinations. Though these approaches overlap to some extent, no single model has been able to account for the complex interplay of these variables as each model emphasizes different mediating processes (Zeidner, 1998, 2007): While some approaches highlight the importance of appraisals (e.g., Pekrun, 2006; Pekrun, Frenzel, Goetz, & Perry, 2007), others address self-regulatory processes (e.g., Boekaerts & Cascallar, 2006; Schnell, Ringeisen, Raufelder, & Rohrmann, 2015). In the context of learning and achievement, self-regulation is depicted as "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 environment" (Pintrich, 2000, p. 453).

In order to depict the complex relationships among self-efficacy, anxiety, and performance in the context of examinations, Lowe et al. (Lowe et al., 2008, pp. 217) introduced a holistic test anxiety model. In essence, the model suggests that personality characteristics like intelligence, trait anxiety, and academic self-efficacy determine the intensity with which a test is perceived as an evaluative threat evoking cognitive, physio-affective, and behavioral state anxiety symptoms. Anxiety, in turn, influences the actual test performance and its appraisals, reflecting back on self-efficacy beliefs in terms of a time-lagged feedback-loop. Despite their holistic approach, Lowe et al. (2008) do neither differentiate the quality of appraisals and/or self-regulation processes nor do they specify assumptions on the interplay of these processes with self-efficacy, test anxiety, and academic performance. In response, the current study combined and tested assumptions from control-value theory (CVT), an appraisal-based emotion theory (Pekrun, 2006; Pekrun et al., 2007; Pekrun & Stephens, 2012), and from the theory of self-regulated goal attainment processes (TSR; Schwarzer, 1998, 2001) on the interplay of self-efficacy, test anxiety, and academic performance by means of a longitudinal design.

1.1. Control-Value theory and its assumptions

CVT is an appraisal theory of emotions that specifies the sequence and quality of cognitive variables assumed to elicit achievement emotions like anxiety, which are directly related to academic performance (Frenzel, Goetz, & Pekrun, 2009; Pekrun, 2006; Pekrun et al., 2007). According to CVT, the emotional quality depends on two appraisal dimensions: (1) *subjective control* over achievement in performance-based activities and outcomes, and (2) the *value* attached to these activities and outcomes. The experience of control is determined by prospective mastery expectations and retrospective attributions. Value appraisals, on the other hand, signify whether the activities and outcomes are rated as positive or negative and the extent to which they are personally relevant.

CVT proposes a sequence of cognitive predictors assumed to trigger anxiety in performance-related test situations which is schematically depicted in Fig. 1 (Frenzel et al., 2009; Pekrun et al., 2007). CVT posits that high dispositional control beliefs like self-efficacy enhance mastery perceptions in achievement situations, thus reducing the anticipated risk of failure. For instance, a student who believes in his or her ability to prepare adequately for an exam (action-control expectancy) will expect a good result (action-outcome expectancy). The anticipation of doing well should, in turn, predict high significance of success, whereas a high risk of failure should lead to reduced significance. Finally, high personal relevance for academic success is assumed to predict greater levels of anxiety which are associated with reduced academic performance.

Despite such precise conceptualization of the relationship structure, validation studies are rare. Existing research has either focused on selected single predictors or, when multiple factors are assessed, has tested the proposed structure of anxiety predictors with cross-sectional designs only (Frenzel, Pekrun, & Goetz, 2007; Goetz, Preckel, Pekrun, & Hall, 2007; Pekrun, 1991; Putwain, Remedios, & Symes, 2015; Ringeisen, Raufelder, Schnell, & Rohrmann, 2016; Selkirk, Bouchey, & Eccles, 2011; Spielberger & Vagg, 1995; Zeidner, 2007). For instance, the study by Ringeisen et al. (2016) was the first to provide empirical evidence for the validity of the full sequence of cognitive test anxiety predictors albeit with a correlational design. However, there is longitudinal evidence that anxiety levels before and after an exam are positively associated (Carver & Scheier, 1994; Ringeisen & Buchwald, 2010).

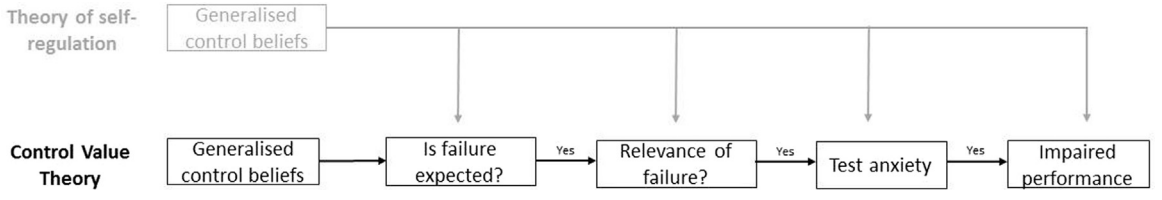

Fig. 1. Schematic depiction of the relationships among the study variables based on the assumptions of control-value theory and the theory of self-regulation (adapted from Frenzel et al., 2009, p. 219, Figure 9.2).