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'It is the situation that makes it difficult': Experiences of nursing students faced with a high-stakes drug calculation test

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ABSTRACT

Test anxiety affects the learning, performance and well-being of students, and it increases as the stakes get higher. Norwegian nursing students must pass a drug calculation test with a flawless performance if they are to qualify as nurses. The aim of the current study was to investigate the test anxiety experiences of students faced with such a high-stakes test. We used a mixed methods approach where the data were collected using a survey questionnaire and a focus group interview. In total, 203 freshman nursing students completed the questionnaire, six of whom also participated in the focus group interview. The survey results showed that 44.3% of the students reported high mathematics test anxiety in the months before the drug calculation test. More than 12% of the high-anxiety students reported a low mathematics self-concept. High and medium self-concept students also experienced high test anxiety. Our analysis of the focus group interview data confirmed that the high stakes of the test increased the test anxiety dramatically.

Introduction

Imagine the following scenario. You are taking a test, but you know that you cannot make any mistakes. If you fail the test, you will have to leave the course. This is a situation faced by Norwegian nursing students, who must complete a drug calculation test with no mistakes to qualify as nurses (Ministry of Education and Research, 2008). This situation is likely to produce stress and test anxiety, which is known to negatively affect students' performance and well-being (Hembree, 1988; Bandalos et al., 1995; Zeidner, 1998). More than 40 years ago, in one of the studies from the 1960s that are still relevant, Hill and Sarason (1966) showed that test avoidance or test failure delayed study progression and led to lower grades than those achieved by students with normal or low test anxiety. In agreement with these findings, recent research (Elliot and McGregor, 1999; Eysenck et al., 2007; Birgin et al., 2010) has shown that test anxiety has a negative influence on students' performance. In the context of nursing education, test anxiety should receive more attention because nursing students have been found to experience more test anxiety than other students (Driscoll et al., 2009). Many nursing students consider that mistakes 'might seriously harm the patients as well as jeopardize their own careers' (Driscoll et al., 2009, 2). In particular, students, including nursing students, report anxiety related to the domain of mathematics and mathematics tests (Hodge, 1999; Glaister, 2007; McMullan et al., 2012). Furthermore, a student's self-concept might significantly affect whether he or she experiences anxiety during an evaluation situation. Self-concept also determines the level of test anxiety, and students with a high self-concept may experience low test anxiety (Bonaccio and Reeve, 2010). Mathematics test anxiety of nursing students and their mathematics- and drug calculation skills has been examined (Driscoll et al., 2009; Evans et al., 2010; McMullan et al., 2010; McMullan et al., 2012; Sulosaari et al., 2012), but few studies have focused on the test anxiety elicited by a flawless test-completion requirement and its relationship to students' self-concept. Therefore, the aim of this study was to examine the effects of a high-stakes test on students' test anxiety.

Test anxiety and the 'goal pathways'

Test anxiety is defined as 'the set of phenomenological, physiological, and behavioural responses that accompany concerns about possible negative consequences or failure on an exam or similar evaluative situation' (Zeidner, 1998, 17). Many theories and

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models of test anxiety have been developed in recent decades (Zeidner, 1998), and there have been discussions about whether test anxiety might be viewed as a relatively stable personality trait (trait anxiety) or an ephemeral emotion related to a situation-specific personality trait (state anxiety) (Zeidner, 2007). Test anxiety has two major components: worry and emotionality (Liebert and Morris, 1967; Zeidner, 1998). These two components are highly correlated and both are known to interfere with performance. Some researchers (Hembree, 1988; Hong, 1999; Cassady and Johnson, 2002) describe worry as cognitive interference with performance, whereas emotionality is viewed as affective interference that leads to physiological symptoms via arousal of the autonomic nerve system, such as trembling, increased heart rate and perspiration. Similarly, students with high test anxiety perform at a lower level than those with low test anxiety (Hembree, 1988) and experience more cognitive interference. Students with high test anxiety spend more time studying than their low-anxiety peers, but they have problems encoding knowledge because of cognitive interference, which in turn leads to low expectations of success (Hembree, 1988).

Study skills, examination preparation, test-taking skills and the specific test questions are factors that contribute to the perception of a test and a test situation as more or less threatening (Spielberg and Vagg, 1995). This threat can influence students' goal orientation. Boekaerts (2007) identified two pathways with different goals among students. For some students, the main goal is related to competence and what Boekaerts referred to as the 'growth' pathway. For other students, the main goal is maintenance of their self-image; these students are said to be on the 'well-being' pathway. These pathways are parallel and students may shift between them. Students facing a challenge will experience tension; an increase in tension may serve as a warning that something is wrong and that the situation must be reconsidered. However, this increased level of tension can be interpreted in different ways. Some students interpret the level of tension as positive. Others may interpret it as a possible threat to their well-being but perceive that they possess sufficient resources to deal with the threat; these people often continue on their growth pathway. By contrast, students who perceive the level of tension negatively may interpret it as a threat to their self-image. They may not have sufficient resources to meet the challenge and are likely to shift from a growth pathway to a well-being pathway. However, if they know that resources are available, such as a teacher who can supervise them, a pathway shift might not occur. Moreover, the importance and consequences of a test may affect whether a student changes pathway. Thus, a high-stakes test also may cause a pathway shift in a student with normal or low test anxiety.

A person's perception of the self, which is known as his or her self-concept, may prevent or reduce test anxiety, and there is an inverse correlation between these two constructs (Zeidner, 1998). Thus, the importance of self-concept needs to be examined in the current context.

Self-concept

According to Shunk and Pajares (2005, 88), the self-concept has a 'varied parentage' and no operational definition. Other constructs (e.g. self-esteem, self-evaluation and self-worth) are used interchangeably with self-concept. In this somewhat complex landscape, Shavelson and Bolus (1982, 3) stated that self-concept refers to a person's perceptions of him or herself, which are 'formed through one's experience with and interpretations of one's environment and are influenced especially by reinforcements, evaluations by significant others, and one's attributions for one's own behaviour'. Stability and a hierarchical system are two critical features that define the self-concept construct (Shavelson and Bolus, 1982). The perception of oneself at the lowest level of a sub-area (e.g. mathematics being one of the academics sub-area) interferes with one's perception of the sub-area. For example, the perception may interfere with a student's self-concept of his or her multiplication ability as part of the mathematics self-concept. Furthermore, the self-concept of sub-areas interferes with students' academic or non-academic self-concepts, which in turn interfere with their more general self-concept. The stability of a self-concept varies throughout this hierarchical system. The general self-concept is the most stable; stability then declines further down the hierarchical system (Shavelson and Bolus, 1982). Self-concepts at the lowest levels are not stable; as they depend on the situation, they are more changeable.

Furthermore, a self-concept has *evaluative* and *descriptive* dimensions that depend on the way people evaluate and describe themselves. Finally, a self-concept is *different* from other constructs such as academic achievement. Thus, a person's actions can be predicted and explained based on these self-concept features (Shavelson et al., 1976). Moreover, people's perceptions of themselves and the way they act have a reciprocal relationship (Shavelson et al., 1976). There is also a reciprocal relationship between the self-concept and test anxiety, for example, in the domain of mathematics (Bandalos et al., 1995; Ahmed et al., 2012). There is a high correlation between self-confidence (a construct that is used interchangeably with self-concept, according to Shunk and Pajares (2005)) and test anxiety. Meijer (2001) suggests that low self-confidence might be a third factor in test anxiety, in addition to worry and emotionality.

High-stakes testing

Another reason for further examining the relationship between the self-concept and test anxiety is the increase in high-stakes testing. According to Putwain (2008a, 2008b), there is renewed interest in the construct of test anxiety. Changes to education policy in several countries have led to an increased use of 'high stakes testing as performance and accountability measures' (Putwain, 2008b, 141). High-stakes tests are associated with major consequences for students, teachers, administrators and schools because important education decisions are made based on the test results (Amrein and Berliner, 2002). For some students, these decisions may mean they are prevented from enrolling in a particular course or must remain at a certain level until they achieve the requisite score, and failure might prevent graduation (Jones et al., 2003). Dropping out of school is also reported to be a consequence of high-stakes testing (Madaus et al., 2009).

Research into test anxiety and high-stakes testing has expanded, with some studies revealing increased test anxiety among children and adolescents (e.g. Putwain, 2008a; von der Embse and Hasson, 2012), although there has been less research into high-stakes testing in higher education (universities and colleges). Zeidner (1996) found that high-test-anxiety students in high schools and colleges used avoidance behaviour when faced with an important exam and that their behaviours were positively related to a situation-specific trait (state anxiety) during an evaluation situation. That study thus supported the hypothesis that if an exam situation is 'construed as a low stress daily routine situation, coping resources are expected to affect outcomes directly rather than to work through coping strategies in impacting upon outcomes' (Zeidner, 1996, 2).

Test anxiety and high-stakes testing in the context of nursing education

Before presenting the research question the context of Norwegian nursing education is briefly explained. In order to be qualified