Paper 1: Do teachers and parents influence a students’ tendency to perceive examinations as threatening?

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Abstract

Recent models of evaluation anxiety (e.g. Zeidner & Mathews, 2005) suggest that the appraisal of an examination as threatening depends upon self-knowledge beliefs, but no route is theorised for situational or interpersonal influences. Negative self-knowledge beliefs contributing to the appraisal of an examination as threatening include avoidant motivations (e.g. fear of failure, fear of incompetence) and perceptions of lower subject competence and/or examination and test-taking skills. Although no direct route is theorised for situational or interpersonal influences, the achievement goals promoted by teachers in the classroom have been demonstrated to influence the student’s personal achievement goals (Greene et al., 2004; Tapola & Niemivirta, 2008) and parental pressure has been demonstrated to influence a negative academic self-concept (Campbell, 1994; Ketsetzis, Ryan & Adams, 1998). The aim of this study is to investigate whether situational or interpersonal factors exert an indirect influence on a student’s appraisal of examinations as threatening through personal knowledge beliefs. Self-report data was collected for test anxiety, personal knowledge beliefs (personal achievement goals, academic self-concept and perceived test competence), teachers’ achievement goals and parental pressure/support in 175 sixth-form college students. Data were subjected to hierarchical regression analyses to establish whether the relationships between the test anxiety and teachers’ achievement goals/parental pressure and support were mediated by personal knowledge beliefs. In this approach, the mediating variable is forced into a regression equation. A reduction in the direct relationship indicates a mediating effect, the significance of which can be established with the Sobel test. Results indicated that parental pressure could exert both direct and indirect effects on test anxiety depending on which component of test anxiety was being accounted for. Parental pressure exerted a direct effect on the worry and tension components of test anxiety and an indirect effect on test-irrelevant thinking component by increasing a student’s personal performance-approach goal. Teacher’s performance-avoidance goals exerted an indirect effect on test anxiety by increasing a student’s personal performance-avoidance goal and in the case of the bodily symptoms component of test anxiety also through a performance-approach goal. In conclusion, teachers who promote motivation through a fear-of-failure in the classroom increase examination anxiety in students who also adopt a fear-of-failure. Parental pressure may directly influence examination anxiety, but also lead to an indirect increase in particular aspects of examination anxiety (headaches, muscle tension and so forth) through students adopting a motivation to demonstrate achievement. These findings suggest that models of test and anxiety and require modifying to account for the influence of parents and teachers.
Introduction

The test anxiety construct

Test anxiety refers to the anxiety experienced by students in an assessment context such as an examination. Most recent conceptualisations of this construct (e.g. Meijer, 2001; Zeidner, 1998) focus on fear-of-failure as the central characteristic, although some broader conceptualisations exist. Both Spielberger (1966) and Lowe et al. (2008) identify negative evaluation from others and threats to esteem/position as important characteristics of the construct. In common with other social-evaluation anxieties (e.g. social interactions, sports, computers and so forth), it consists of distinct cognitive, affective-physiological and behavioural components (Zeidner & Mathews, 2005). The cognitive component refers to negative thoughts that arise during the assessment situation (worries and self-depreciating statements) that may interfere with performance. The affective-physiological component refers to the subjective perception of autonomic arousal occurring during the assessment situation. The behavioural expression of test anxiety includes deficient study skills and the procrastination of academic work.

Zeidner and Mathews (2005) theorise a self-regulative model of test anxiety based on transactional models of stress processes and cybernetic models of self-regulation. Individual differences in executive functioning are influenced by the content of self-knowledge (e.g. negative self-beliefs, dysfunctional plans and avoidant motivations), maladaptive interaction with the situation (e.g. performance failure) and a congruent situation providing evaluative threat. Test anxious behaviour is evoked when the student believes that the evaluative situation, such as an assessment, taxes or exceeds his or her intellectual, motivational and social capabilities. Shorter-term distress and worry are activated by accessing negative self-beliefs (e.g. perceptions of low competence) and counterproductive coping (e.g. self-blame). Metacognitive beliefs play an important role in the maintenance of negative self-referent beliefs. Longer term distress and worry are related to dysfunctional styles of person-situation interaction.

A great deal of literature has established how the appraisal of an assessment as more or less threatening is influenced by both characteristics of the evaluative situation and personal factors. For instance, Zeidner’s (1998) transactional process model of test anxiety specifies the following characteristics of the evaluative situation: nature of the task, difficulty, atmosphere, time constraints, examiner characteristics, mode of administration and physical setting, and the following personal characteristics: trait test anxiety, need for achievement, self-efficacy, scholastic ability, information processing capacity, study skills and test-wiseness. Student demographics seem to play only a small role in test anxiety. For instance, Putwain (2007) reported that age, gender, ethnic and socio-economic background were significant predictors of test anxiety scores, but accounted for only nine percent of variance (age predicted differences in the affective-physiological component only). Whether English was an additional or first language did not affect test anxiety scores. Similarly, Whitaker Sena, Lowe and Lee (2007) reported that gender, age and learning disability predicted only a small proportion of variance in test anxiety component scores (the largest $R^2$ value was .05 for cognitive obstruction – a cognitive dimension of test anxiety). Although some speculative explanations for gender differences exist (e.g. in
terms of socialisation practices) demographic differences in test anxiety remain under theorised and do not feature in the self-regulatory model of test anxiety.

**Test Anxiety and Achievement Goals**

The inclusion of self-regulatory processes in Zeidner and Mathews’ (2005) model places a greater emphasis on motivation and self-perception than has been present in previous models of test anxiety (e.g. Spielberger & Vagg, 1995; Zeidner, 1998). Recent work addressing the issue of how motivation and test emotions (including anxiety) may be related has used the achievement goals construct. Achievement goals have been conceptualised as the different aims students may hold for engaging in academic tasks (Elliot, 2005), and the most recent theoretical framework proposes distinct mastery and performance goals along an approach-avoidance dimension (Elliot & McGregor, 2001). Performance goals represent a normative concern with performance relative to others. The aim could be to demonstrating ability relative to others (approach) or avoiding failure relative to others (avoidance). Mastery goals correspond to an intrinsic interest in personal learning (approach) or avoiding incompetence (avoidance).

Hagtvet and Benson (1996) suggest that test anxiety and performance-avoidance constructs are related by a fear-of-failure. Test anxiety, with its emphasis on information processing and interference models of anxiety-performance represents the cognitive aspect of the fear-of-failure and performance-avoidance, with its emphasis on goal-orientated behaviour, the motivational aspect. Elliot and McGregor (1999) proposed a hierarchical integrative model in which highly trait test anxious students could adopt performance-approach or performance-avoidance goals. A negative relationship between test anxiety and assessment performance was only observed between students who adopted a performance-avoidance goal, an effect mediated by state worry. A positive relationship between test anxiety and assessment performance was observed with students adopting a performance-approach goal. The majority of research has supported a positive relationship between performance-avoidance goals and test anxiety (Elliot & McGregor, 1999; Pekrun, Elliot, & Maier, 2006; Tanaka, Takehara, & Yamauchi, 2006), however only weak or non-significant relationships between performance-approach goals and test anxiety (Elliot & Church, 1997; Middleton & Midgley, 1997; Sideridis, 2005).

Certainly, the outcomes of a performance-avoidance goal, including distraction, lack of self-regulation, shallow processing of information, unwillingness to seek help, reduced intrinsic motivation, procrastination, self-handicapping and poor performance (see Middleton & Midgely, 1997) more closely resemble those of test anxiety than the positive, if instrumental, outcomes usually associated with a performance-approach goal. Nonetheless, it is possible that performance-approach goals are associated with a more facilitating type of test anxiety or the social derogation aspect of test anxiety (see Lowe et al., 2008), an approach consistent with Zeidner’s (1998) typology of test anxious students (e.g., failure-avoiding, failure-accepting and so forth) suggesting that test anxiety can emerge from a variety of sources (also see Putwain, 2008, and Mathews, Hillyard & Campbell, 1999). Such theorising may make a fruitful topic for future research, however, the weight of current evidence suggests that a performance-avoidance, but not a performance-approach goal, would predict a higher degree of test anxiety.
Evidence suggests that test anxiety is unrelated to mastery goals (Elliot & Church, 1997; Middleton & Midgley, 1997), however the framework used in this research used a tripartite conceptualisation of achievement goals, prior to the emergence of the mastery-avoidance construct (cf. Elliot & McGregor, 2001). When viewed from the perspective of the 2x2 framework, the mastery goal as conceptualised in the tripartite approach corresponds to a mastery-approach goal (Elliot, 2005), so it may be more precise to suggest that test anxiety is unrelated to a mastery-approach goal. The self-regulation model of test anxiety posits that it is not the goal per se that is the crucial variable, but the avoidant motivation, thus a mastery-avoidance goal would also predict a higher degree of test anxiety. Research using the 2x2 framework has supported this prediction (Conroy & Elliot, 2004; Elliot & McGregor, 2001). Thus, a mastery-avoidance goal, but not a mastery-approach goal, would predict a higher degree of test anxiety.

Perceptions of competence and test anxiety

Competence beliefs are a form of self-knowledge, which according to self-regulatory model, play an important role in the appraisal of threat. Self-knowledge characterised by the perception of low competence leads to appraisals anticipating negative outcomes (such as failure) under uncertain conditions, hence evaluative situations (such as assessments and examinations) are perceived as more threatening. This is particularly the case where past failure was attributed to intelligence/ability rather than effort (Mueller & Dweck, 1998). Several studies have reported that perceptions of lower competence predict higher test anxiety (e.g. Chamorro-Premuzic, Ahmetoglu & Furnham, 2008; Goetz, Preckel, Zeidner & Schleyer, 2008; Hembree, 1988; Schwarzer, Mueller & Greenglass, 1999; Zeidner & Schleyer, 1999). Furthermore, intrusive thoughts that may interfere with performance only occur in evaluative situations for those students who are low in perceived competence (Elliott & Dweck, 1988; Farr, Hofman & Ringenbach, 1992) and high competence can act as a buffer against the detrimental effects of an evaluative situation (Van Yperen, 2007).

Marsh (2006) is highly critical of self-concept research (including confidence, self-esteem and self-competence constructs) using unidimensional measures, as much of the research reviewed above has done. He argues that students can hold a high non-academic self-concept (e.g. a physical self-concept) and a low academic self-concept. Furthermore, academic self-concept is also highly differentiated in that a student could hold a high academic self-concept in one subject (e.g. English), but not another (e.g. Mathematics). Research relying on global measures is therefore of limited usefulness in predicting educationally salient outcomes. In order to address this methodological limitation, research examining the relation between test anxiety and competence beliefs should theorise the latter as multidimensional and subject-specific.

Previous models of test anxiety (e.g., Zeidner, 1998) have made a distinction in personal factors between test-wiseness (examination and test-taking skills) and academic ability, in line with the multidimensional theorising described above, the competence beliefs addressed in this study will also make a distinction between two different forms of competence beliefs: subject-specific perception of ability (academic self-concept) and subject-specific perception of examination and test-taking skills (test competence). A perception of poor academic self-concept and poor test competence will predict a higher degree of test anxiety.
Situational influences on test anxiety

The only situational influences included in the self-regulatory model of test anxiety (Zeidner & Mathews, 2005) are those directly associated with the evaluative situation (i.e. high stakes context, difficult test items/examination questions and so forth) and no route is theorised for situational or interpersonal factors that are not included in the evaluative situation to influence individual differences in executive functioning. Evidence suggests, however, that other persons (e.g. parents) may be a significant influence on anxiety (referred to as ‘other-referenced anxiety’ in contrast to ‘self-referenced anxiety’) where they may be the evaluator of potential failure outcome (Hagtvet, Man, & Sharma, 2001; Proost, Derous, Schreurs, Hagtvet, & De Witte, 2008). Parents are perceived as sources of pressure by students when they communicate messages perceived by the student as emphasising conditions of acceptance based on achievement in examinations and others assessments, rather than the effort made (Putwain, 2009). It is therefore, no surprise that perceived parental pressure is associated with poor social and academic adjustment (Baumrind, 1978; Campbell & Mandell, 1990; Maccoby & Martin, 1983) and an increase in test anxiety (Singh & Broota, 1992). Social derogation, the fear of negative judgement from others following test failure, has been included in broader conceptualisations of the test anxiety construct (Lowe et al., 2008; Friedben & Bendas-Jacob, 1997).

Parental pressure would predict a higher degree of test anxiety, as the threat of negative evaluation from others is increased. Conversely, it can also be theorised that parental support would predict a lower degree of test anxiety, as the threat of negative evaluation is reduced. As there is no direct route for other-referenced anxiety in the self-regulatory model, a mediated hypothesis is advanced where parental pressure/support exerts an indirect influence of test anxiety through personal competence beliefs and achievement goals. Parental pressure has been found to have a detrimental effect on academic self-concept and achievement, whereas support can have a positive effect (Campbell, 1994; Ketsetzis, Ryan & Adams, 1998) and other-referenced anxiety is a predictor of performance-avoidance goals, in contrast with self-referenced anxiety which is a stronger predictor of mastery-avoidance goals (Proost et al., 2008). It is predicted that parental pressure will increase test anxiety by reducing competence beliefs and increasing a performance-avoidance goal whereas parental support will reduce test anxiety through increasing competence beliefs and reducing a performance-avoidance goal.

Evidence has indicated how features of the classroom environment, such as a teacher’s positive regard of students and the number of support acts, influence students’ motivation, attitudes and competence beliefs (Chouinard & Karsenti, 2005; Eccles, Wigfield, Midgley, Maclver, & Feldlaufer, 1993; Vallerand, Fortier, & Guay, 1997). Related to this line of theorising, students’ personal achievement goal orientations are believed to be influenced, in part, by the corresponding classroom goal structures and the achievement goals promoted by their teachers (Anderman & Midgley, 1997; Midgley & Urdan, 2001; Greene, Miller, Crowson, Duke & Askey, 2004; Tapola & Niemivirta, 2008) and classroom goal structures can influence cognitive and behavioural outcomes indirectly through personal achievement goals (Anderman & Midgley, 1997; Church, Elliot & Gable, 2001). Given these established links between classroom/teachers’ goal
structures and a student’s personal achievement orientation, and between personal achievement goals and test anxiety, a logical extension of the self-regulatory model would be to theorise a second situational route to anxiety for classroom/teachers’ goal structures, mediated through students’ personal avoidant goals orientations. Following the line of reasoning advanced above that other-referenced anxiety is likely to influence performance-avoidance rather than mastery-avoidance goals (Proost et al., 2008) it is predicted that a classroom performance-avoidance structure will increase test anxiety by and increasing a personal performance-avoidance goal orientation.

Aims of the present study
The present study aims to further understanding of the relationship between test anxiety and two situational/interpersonal influences: the goal structure promoted by teachers in the classroom and parental pressure/support. These situational/interpersonal influences are hypothesised to have an indirect effect on test anxiety scores through personal knowledge beliefs. It is predicted that teachers’ performance-avoidance goals will predict higher test anxiety scores, mediated by personal performance-avoidance goals. For parental influence it is predicted that pressure will predict higher test anxiety scores whereas parental support will reduce test anxiety. Both effects are mediated by competence beliefs and performance-avoidance goals. An a priori model representing these hypothesised relationships is diagrammed in Figure 1 below.
Method

Participating students and institution

Data was collected from 175 students (115 female, 60 male), mean age 17 years ($SD = 1.0$), following courses in General Certificate of Education, Advanced Level and Advanced Subsidiary Psychology and Sociology at a suburban sixth-form college. These courses follow a two-year programme of study where the Advanced Subsidiary (AS level) examinations are taken at the end of the first year and the Advanced Level (A level) examinations are taken at the end of the second year. Sixth-form colleges provide post-compulsory education representing a tier of education between school and university and university admission is often made on the basis of grades in Advanced Subsidiary and Advanced Level qualifications (and their equivalents). Although the ability of the sample may be, in part, self-selected as sixth-form colleges often require minimum entrance grades in school leaving qualifications, the role of the qualification in university admission provides a high stakes context to these courses.

Design and data collection

All variables were measured using six self-report questionnaires (see below for details) which were presented together in a pack along with an information/consent sheet which provided students with details of various support systems both inside college and external if required. Questionnaire order was counterbalanced. Data was collected on a single testing occasion from participating students who completed measures during their normal class time, administered by one of the researchers. A salient issue in the design of this study is whether the constructs under study should be considered as global or specific. Domain and content specificity has been established in the context of interest (Krapp, 2003), self-efficacy (Bandura, 1997; 2001), achievement goals (Pintrich, 2000; 2003) and self-concept (Marsh, 2006). For example, a student might have strong interest in one subject and not another, and a perception of high competence in one subject and not another, and therefore global measures of these constructs have little predictive value. Following this line of argument, several of the constructs under investigation in this study have been made domain specific to Psychology/Sociology (for details see below): achievement goals (both personal and teachers’), academic self-concept and test competence. For this reason, students completed the questionnaires in the context of either Psychology or Sociology and students taking courses in both subjects could choose either.

Instruments

The Achievement Goals Questionnaire (Elliot & McGregor, 2001) is a twelve-item questionnaire providing scores on mastery and performance goals along approach and avoidance dimensions. Elliot & McGregor (2001) reported excellent psychometric properties and this 2x2 framework represents the most recent theorisation of the achievement goals construct (for a review see Elliot, 2005). Students respond to items (e.g. ‘My fear of performing badly is what motivates me’) on a seven-point scale (not at all true of me – very true of me).
Reliability coefficients for mastery-approach ($\alpha = .81$), mastery-avoidance ($\alpha = .80$) and performance-approach goals ($\alpha = .77$) were all acceptable-good. The reliability coefficient for performance-avoidance goals ($\alpha = .67$) was marginally below the accepted level of $\alpha \geq .7$ (see Kline, 1999) and lower than the value of $\alpha = .83$ reported by Elliot & McGregor (2001). Recalculating the reliability coefficient after removing single items did not improve the $\alpha$ value.

The Patterns of Adaptive Learning Scales (Midgley et al., 2000) are an extensive set of measures designed to examine the association between the learning environment and students’ motivation, affect and behaviour. In this study, only the twelve items corresponding to the perceptions of teachers’ goals were used providing separate scores for performance-approach, performance-avoidance and mastery goals. This questionnaire is based on a trichotomous framework of achievement goals, developed prior to the 2x2 framework used in the AGQ, and there are no separate mastery scores corresponding to approach and avoidance dimensions. Elliot (2005) suggests that conceptualisations of the mastery goal used in trichotomous frameworks represent an approach rather than avoidance dimension and the face validity of the mastery items used in this questionnaire would support this interpretation. Where relevant, items were adapted to refer to the specific subject domain of psychology or sociology. Students respond to statements (e.g. ‘My teacher gives us time to really explore and understand new ideas’) on a five-point scale (not at all true – very true). Excellent psychometric properties are reported in the scales manual (Midgley et al., 2000). Reliability coefficients for teachers’ performance-approach and mastery scales were acceptable-good ($\alpha = .78$ for both), but marginally below the accepted level of $\alpha \geq .7$ for teachers’ performance-avoidance goals ($\alpha = .66$) and lower than the value of $\alpha = .79$ reported by Midgley et al. (2000). Recalculating the reliability coefficient after removing one item (‘My teacher tells us how we compare to other students’) improved the reliability coefficient to $\alpha = .71$ and so was not included in subsequent analyses.

The Study Management and Academic Results Test (Topman, Kleijn, van der Ploeg & Masset, 1992) is a four-factor measure of study- and examination-related cognitions: academic competence, test competence, time management and strategic studying. In this study, four test competence items were selected and adapted by making them domain specific to Psychology/ Sociology. Students responded to statements (e.g. ‘I do not find it difficult to prepare for exams in Psychology’) on a five-point scale (strongly agree – strongly disagree). Excellent psychometric properties were reported by Topman et al. (1992) and this scale has been used in subsequent research examining the role of study- and examination cognitions on academic performance (e.g. Kleijn, van der Ploeg & Topman, 1994). The reliability coefficient for test competence of $\alpha = .58$ is well below the accepted level of $\alpha \geq .7$. Recalculating the reliability coefficient after removing one item (“I have great difficulty managing the amount of study material for an examination”) improved the reliability coefficient to $\alpha = .68$, marginally below the accepted level and so was not included in subsequent analyses.

The Academic Self Description Questionnaire II (Marsh, 1990; 1992) measures a student’s perception of their academic competence in sixteen different subject domains (English Language, History, Mathematics and so forth) and a general ‘school subjects’ domain. The original version of the measure does not contain Psychology/ Sociology as a subject domain, and five items were
adapted for use in these subjects. Students respond to statements (e.g. ‘Work in Psychology is easy for me’) on an eight point scale (definitely false – definitely true). This measure is arguably one of the most widely used instruments in psycho-educational research available today and extensive data regarding the psychometric properties of the original version is reported in Marsh (2006). The reliability coefficient of $\alpha = .92$ is excellent.

The Revised Test Anxiety scale (Benson, Moulin-Julian, Schwarzer, Seipp, & El-Zahhar, 1992) is based on the most recent theorisations of the test anxiety construct and provides scores on four subscales: worry, tension, test-irrelevant thinking and bodily symptoms. Item wording referring to ‘tests’ was changed to ‘exams’ in order to emphasise the high stakes nature of the assessments associated with the GCE Advanced and Advanced Subsidiary programme of study. In this 20-item questionnaire, students respond to statements (e.g. ‘During exams I feel very tense’) on a four-point scale (almost never – almost always). This scale has demonstrated excellent psychometric properties both in Benson et al. (1992) and in subsequent research (e.g. Benson & El-Zahhar, 1994; Hagtvet & Benson, 1997), and has been used extensively in recent test anxiety research (e.g. Keogh, Bond, French, Richards & Davies, 2004). Reliability coefficients for worry ($\alpha = .75$), test-irrelevant thinking ($\alpha = .84$), tension ($\alpha = .79$) and bodily symptoms ($\alpha = .80$) were all in the range of acceptable to good.

The Inventory of Parental Influence (Campbell, 1994) is a five factor scale that measures a family member’s perceptions of parental pressure, parental support, parental help, time management/monitoring and pressing for intellectual development. In this study, the twenty-six items corresponding to parental pressure and support were adapted (thirteen for each) by changing item wording from ‘school’ to ‘college’ to make the questionnaire appropriate to the type of institution in which data were being collected. Students responded to statements (e.g. ‘I do well in college, but my parents think I could do better’) on a five-point scale (strongly agree – strongly disagree). Factorial validity and reliability were reported by Campbell (1994) and this scale has subsequently been used in research examining how family factors influence educational outcomes (e.g., Ketsetzis, Ryan & Adams, 1998). The reliability coefficient for parental pressure was excellent ($\alpha = .90$), but marginally under the accepted level for parental support ($\alpha = .68$) and lower than the value of $\alpha = .71$ reported by Campbell (1994). Recalculating the reliability coefficient after removing one item (‘My parents are never satisfied if I do my best’) improved the reliability coefficient to $\alpha = .72$, and so this item was not included in subsequent analyses.

### Results

**Bivariate correlations**

Zero order correlations are shown in Table 1 below. Scale reliability coefficients of $\alpha < .70$ may result in an underestimation of Pearson’s $r$ coefficients, thus increasing the chances of making a type two error, that is, concluding no significant relationship is present when in fact it may be. To control for this possibility, the Pearson’s $r$ coefficients were corrected for a performance-avoidance goal and perceived test competence using the calculation suggested by Kline (2000). The various components of test anxiety tend to be positively
correlated, although test-irrelevant thinking and tension was non-significant. Achievement goals, both performance and mastery, along approach and avoidance dimensions are also positively correlated. Mastery and performance goals along an avoidance dimension are positively correlated to test anxiety with the exception of test-irrelevant thinking. A performance-approach goal was positively correlated with bodily symptoms and inversely correlated with test-irrelevant thinking. Mastery-approach goals were unrelated to test anxiety. Academic self-concept and perceived test competence are positively correlated with each other, and are inversely correlated with the various components of test anxiety with the exception of academic self-concept and bodily symptoms.
### Table 1: Descriptive data and zero order correlations

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* p<.05; ** p<.01

a r values were corrected to account for α <.7
Teachers’ mastery goals positively correlated with teachers’ performance-avoidance goals. Teachers’ performance-approach goals were unrelated to either mastery or performance-avoidance goals. Teachers’ performance-approach and mastery goals were wholly unrelated to test anxiety, but performance-avoidance goals show a small positive correlation to test anxiety, with the exception of test-irrelevant thinking. Parental pressure and support were not significantly correlated with one another and parental support unrelated to test anxiety. Parental pressure showed small, significant, positive correlations with all test anxiety components except for tension. In summary, several personal factors were related to test anxiety including avoidance goals (both mastery and performance), academic self-concept and perceived test competence. Of the situational factors, a teachers’ performance-avoidance goal and parental pressure were related to test anxiety.

In addition to these relationships described above concerning predictions based on the self-regulative model, there are several other, unexpected, relationships which warrant further comment. Positive correlations were reported between mastery-approach and performance-avoidance goals and between mastery-avoidance and performance-approach goals. Teachers’ mastery goals were positively correlated, not only with a personal mastery-approach goal, but also with personal performance-approach and performance-avoidance goals. Furthermore, teacher’s mastery goals were also positively correlated with teachers’ performance-avoidance goals. Finally, perceived parental support was positively correlated with personal avoidance goals, both mastery and performance, whereas parental pressure was positively correlated with a personal performance-approach goal. Parental support was also positively correlated with teachers’ performance-avoidance and mastery goals.

Hierarchical regression analysis

The purpose of this analysis was to establish whether the hypothesised relationships between test anxiety and parental pressure/support and between test anxiety and teachers’ achievement goals were direct or mediated by academic self-concept, test competence or personal achievement goals. The analytic rationale for a mediational analysis used here follows the modus operandi suggested by Baron & Kenny (1986) whereby a significance of a direct relationship between test anxiety and parental pressure/support or classroom achievement goals would be reduced, in the case of partial mediation, or become non-significant, in the case of full mediation, when the mediating variable is accounted for. Hierarchical regression analysis will be used by entering parental pressure/support or classroom achievement goals in the first step and the mediating factor in the second step. Mediation would be indicated by a significant $\beta$ value in step one being reduced or becoming non-significant at step 2.

Before a mediational analysis can be conducted, however, a series of preconditions must be met: 1. the predictor variable (parental pressure/support or classroom achievement goals) must be significantly related to the outcome variable (one or more of the test anxiety components), 2. the mediating variable (academic self-concept, test competence or personal achievement goals) must be significantly related to both the outcome variable and the predictor variable. Using Table 1 above as a guide with which to gauge these preconditions, parental support can be rejected from the outset as there is no direct relationship with any of the test anxiety components. Significant direct relationships were reported between parental
pressure and the worry, test-irrelevant thinking and bodily symptoms components of test anxiety, and so these warrant further investigation. Teachers’ performance-approach and mastery goals can also be rejected as no direct relationship was reported with any test anxiety components, however teachers’ performance-avoidance goals were significantly related to the worry, tension and bodily symptoms components of test anxiety and so these relationships can also be further investigated.

None of the preconditions of parental pressure and worry were met. Although parental pressure was significantly related to a performance-approach goal, this was not related to worry and it can be concluded that the relationship between parental pressure and worry is a direct one that is not mediated by achievement goals, academic self-concept or perceived test competence. Preconditions were met however for: 1. parental pressure, performance-approach and test-irrelevant thinking and 2. parental pressure, performance-approach and bodily symptoms. Table 2 below shows the results of the mediational analysis. When performance approach was forced into the regression equation for test-irrelevant thinking, the β value for parental pressure increased from .21 to .25 indicating that performance-approach goals do not play a mediating role. The relationship between parental pressure and test-irrelevant thinking is direct. When performance-approach was forced into the equation for bodily symptoms, the β value for parental pressure dropped from .17 (p = .02) to .14 (p = .06) and became marginally non-significant. A Sobel test confirmed this reduction was significant (z = 1.76, p = .04) indicating a small mediating effect and that the relationship between parental pressure and bodily symptoms is non-direct.

Preconditions were met for 3. teachers’ performance-avoidance goals, worry and a personal performance-avoidance goal, 4. teachers’ performance-avoidance goals, tension and a personal performance-avoidance goal, 5. teachers’ performance-avoidance goals, bodily symptoms and a personal performance-avoidance goal and 6. teachers’ performance-avoidance goals, bodily symptoms and a personal performance approach-goal. The results of this analysis are also shown in Table 2 below. When a personal performance-avoidance goal was forced into the equation for worry, the β value for teachers’ performance avoidance goals dropped from .18 (p = .02) to .15 (p = .06) and became marginally non-significant. A Sobel test confirmed this reduction was significant (z = 2.01, p = .02) indicating that the relationship between teachers’ performance-avoidance goals and worry is mediated by a personal performance-avoidance goal. When a personal performance avoidance goal was forced into the equation for tension, the β value for teachers’ performance-avoidance goals dropped from .21 (p = .004) to .18 (p = .02), but remained significant and a Sobel test confirmed this reduction was significant (z = 2.01, p = .02). This analysis suggests that teachers’ performance-avoidance goals show both a direct relationship with tension and is partially mediated through personal performance-avoidance goals.

When a personal performance-avoidance goal was forced into the equation for bodily symptoms, the β value for teachers’ performance avoidance goals dropped from .16 (p = .04) to .13 (p = .08), and became non-significant. A Sobel test confirmed this reduction was just significant (z = 1.64, p = .05) suggesting that the relationship between teachers’ performance-avoidance goals and bodily symptoms is mediated by a personal performance-avoidance goal. When this analysis was repeated using performance-approach goals as the mediating variable, the β value for teachers’ performance-avoidance goals dropped from .16 (p = .04) to .13 (p = .08).
.08), and became non-significant. A Sobel test confirmed this reduction was just significant ($z = 1.61, p = .05$) suggesting that the relationship between teachers’ performance-avoidance goals and bodily symptoms is also mediated by a personal performance-approach goal.

Discussion

The aim of this study was to investigate the relationships between test anxiety and two situational/ interpersonal influences: teachers’ achievement goals and parental pressure/ support. The reported relationships between test anxiety and parental pressure/ support provide partial support for the self-regulatory model which does not theorise any route from parental influence to test anxiety. None of the relationships with parental support were significant, consistent with the self-regulatory model, however significant relationships were reported between parental pressure and the worry, test-irrelevant thinking and bodily symptoms components of test anxiety. Parental pressure was associated with stronger worry and test-irrelevant thinking components, directly, and with a stronger bodily symptoms component, indirectly, through a performance-approach goal. This latter point suggests that parental pressure may motivate students to adopt a performance-approach goal, but is ultimately associated with an increase in test anxiety. These findings theorise an important external determinant of test anxiety and suggest that the self-regulatory model requires modification to include the influence of parental pressure both directly and indirectly. Another recent model of test anxiety proposed by Lowe et al. (2008) does include negative adult evaluation as a proximal influence, but only after distal intrapersonal variables, so could only account for a direct route, and not how a performance-approach goal could mediate such relationships.

The reported relationships for test anxiety and teachers’ achievement goals also provides partial support for the self-regulatory model which does not theorise any route from teachers’ goals to test anxiety. Consistent with the self-regulatory model there were no significant relationships reported for teachers’ performance-approach goals or teachers’ mastery goals. Put simply, teachers promoting a motivation to learn or demonstrate achievement, relative to peers, had no bearing on test anxiety. Significant relationships, however, were reported for test anxiety and teachers’ performance-avoidance goals. This relationship was mediated by a personal performance-avoidance goal for worry and bodily symptoms, and both personal performance-avoidance and -approach goals for bodily symptoms. The relationship was partially mediated by a personal performance-avoidance goal for tension. In summary, teachers’ promoting a fear of demonstrating low achievement, relative to peers, is associated with a higher test anxiety, primarily through increasing the students own fear of demonstrating low achievement relative to peers. This finding demonstrates another potentially important determinant of test anxiety, which at present is under theorised, and highlights the possibility that other factors associated with learning environment are important in the development and/ or maintenance of test anxiety. As with parental pressure, the self-regulatory model does not include a route for teachers’ achievement goals or other classroom environment influences (nor does the above mentioned model by Lowe et al., 2008) and may require modification to account for the primarily indirect role for a teachers’ performance-avoidance goal.
### Table 2 Mediation tests

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<th>Predictor/ Mediator</th>
<th>β</th>
<th>SE</th>
<th>R²</th>
<th>ΔR²</th>
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<tr>
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<td>.21**</td>
<td>.01</td>
<td>.04</td>
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<td>Step 2 Parental pressure</td>
<td>.25***</td>
<td>.01</td>
<td>.08</td>
<td>.04**</td>
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<tr>
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<td>.06</td>
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<td>.03</td>
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<td>.05</td>
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<td>.09</td>
<td>.07</td>
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<td><strong>4. Personal performance-avoidance goals as a mediator of teachers’ performance-avoidance goals and tension</strong></td>
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<td><strong>5. Personal performance-avoidance goals as a mediator of teachers’ avoidance goals and bodily symptoms</strong></td>
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<td><strong>6. Personal performance-approach goals as a mediator of teachers’ avoidance goals and bodily symptoms</strong></td>
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* p<.05, **p<.01, ***p<.001

The unexpected relationships between teacher’s mastery and performance-avoidance goals may reflect teachers promoting different goals simultaneously in the classroom. For instance, teachers may use fear appeals as a motivational device to encourage students to prepare for examinations while also encouraging students to
develop a more intrinsic interest in a particular subject (Putwain & Roberts, 2008). The relationships between teachers’ mastery goals, and personal performance-approach and performance-avoidance goals are difficult to explain without recourse to causality, which is, of course, precluded by the design of this study. One possibility, given the high stakes context in which data was collected, is that an emphasis on learning in the classroom, represented through teachers’ mastery goals, assists students in the potentially competitive nature of university entrance through achieving particular grades, represented through personal performance goals. A rival hypothesis may be that students with greater concerns of performance relative to their peers, in their forthcoming AS and A Level examinations simply perceive their teachers as promoting a learning environment as a means to help them achieve their goals.

The unexpected relationships between perceived parental support and personal mastery-avoidance and performance-avoidance goals is also hard to explain in non-causal terms. The possibility that students with an avoidant motivation, whether mastery or performance, are attracting a higher degree of parental support as a result of their fears, seems more plausible than parental support resulting in an avoidant motivation. One or more additional variables may be required to explain the relationships between perceived parental support and the obviously unrelated teachers’ performance-avoidance and mastery goals. A variable such as student perception or influence would fit with the proposed explanation for perceived parental support and personal achievement goals advanced above. These explanations are necessarily speculative however, and further research would be required to clarify the nature of these relationships.

The main limitation of this study results from the correlational design. Personal beliefs are conceptualised as antecedents of test anxiety in Zeidner & Mathews’ (2005) self-regulatory model and the same rationale could be extended to parental pressure/ support and teachers’ achievement goals, although they are not specified in the self-regulatory model. However tempting it may be to infer causal relations between variables in this study, such an interpretation should be resisted. For instance, parental pressure may not be an antecedent of test anxiety, rather that test anxious students perceive their parents to be more pressuring. The only way to demonstrate the causal nature of these variables while maintaining the substantive, applied, focus of the study would be to utilise a longitudinal design. The work of Marsh (2006) is exemplary in this respect for developing cross-lagged longitudinal designs using structural equation models as an analytic framework, to map out causal relationships in academic self-concept. It would make for a robust design if a follow-up study, and indeed test anxiety research in general, was developed along these lines, where test anxiety and personal beliefs interact over time in a reciprocally causal fashion.

The findings of this study highlight several practical steps that may be taken to reduce test anxiety by changing the conditions that contribute to test anxiety, rather than reducing the manifest anxiety itself. First, the finding that teachers’ performance-avoidance goals were positively related to test anxiety and their performance-approach and that mastery goals were unrelated to test anxiety clearly suggests that in order to reduce the test anxiety of their students, teachers should adopt and promote mastery and performance-approach goals in their classrooms rather than performance-avoidance goals. Ames (1992) discusses a number of strategies for teachers to use in their classrooms to achieve this end. Given the
publicly competitive context of secondary and tertiary education systems of assessment, educational psychologists could draw upon cognitive analytic and reframing approaches to support schools and colleges in enabling students, through pastoral and student support work, to minimise the development and influence of performance avoidance goals (e.g., Yahav & Cohen, 2008). It may also be that the use of student feedback upon examination processes would enable schools to make general adjustments that are conducive to minimising the influence of students’ performance avoidance goals. Second, it would be helpful for students’ parents to be made aware of the test anxiety benefits of being ‘supportive’ rather than ‘pressuring’ of their children in relation to examination preparation and performance. This information could be communicated to parents through induction meetings and school publicity information, written communications about examinations, as well as face-to-face progress meetings at parents’ evenings and reports. School staff and the local educational psychology services could provide additional advice to parents on the practicalities of providing such support and minimising pressure through the use of twilight sessions in school and/ or a telephone helpline (Farrell et al., 2006).

In conclusion, this preliminary study has demonstrated how situational/interpersonal factors may be related to self-reported test anxiety. Parental pressure and teachers’ performance avoidance goals emerged as significant predictors. The influence of these variables, however, was differential across the various test anxiety components, and several of the situational predictors followed indirect routes. Current models of test anxiety, such as Zeidner & Mathews’ (2005) self-regulatory model, do not account for these situational influences and may require modification in the future to specify routes to test anxiety.

Notes:
1We have adopted the convention used by Cohen (1992) for describing r values of: small .01 to .03, medium/moderate .03 to .05 and large >.05.
2The calculation for $r_c$ is $r_o / (√r_{s1} × √r_{s2})$ where $r_o$ is the observed value of $r$, $r_{s1}$ is the $\alpha$ for one scale and $r_{s2}$ the $\alpha$ of the other scale.

References


Urdan (Eds.) *Adolescence and Education* (Vol. 2). Greenwich, CT: Information Age Publishing.


