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Changes in student motivation over the final year of high school

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Abstract

The final year of high school in New South Wales (Australia) is characterised by a high stakes, performance-oriented learning environment. This article is a report of the results of an investigation into the changes over time that may occur in the achievement motivation of final-year school students. Two sets of analyses of repeated measures are reported. The results indicate that declines occur in students' attributes of productive achievement motivation, such as performance-approach learning goal orientation and academic self-efficacy, with concomitant increases in non-productive attributes such as self-handicapping strategies, anxiety and depression. These findings are discussed in the light of a model of achievement motivation (Anderman & Maehr 1994) and Bandura's (1993) self-efficacy theory.

For many students, undertaking the New South Wales (NSW) Higher School Certificate (HSC) during the final year of high school is a challenging and positive undertaking. Such students possess the resources to meet the demands of the task. They are able to develop and maintain a productive and adaptive tableau of motivational attributes, enabling them to respond to a demanding array of assignments, examinations and deadlines – all within a context of performance and competition. For some other students, the demands of the HSC will, at times, tax their capacity to respond effectively. Students who find it difficult to match the demands of their final school year with the resources available to them may experience a decline in motivation and confidence, a loss of enjoyment and an increase in negative emotional states. Recent research has shown that changes in students' achievement motivation attributes and affective distress can occur between the beginning of Term 1 in Year 12 and prior to the Trial Examination period (Smith, Sinclair & Chapman 2002), and that Year 11 and 12 students report levels of negative emotional states that exceed normal limits (Hodge, McCormick & Elliott 1997; Smith & Sinclair 2000).

These changes in motivational and affective attributes may arise for a variety of reasons. Firstly, optimal performance is expected continuously over a 12 month

period, with students required to complete an array of assessments and examinations beginning in Term 4 of Year 11 and ending in final, external examinations in Term 4 of Year 12. Secondly, research has indicated that Year 12 students express concern regarding achievement issues such as examinations and future employment (Frydenberg & Lewis 1996, 1998). In particular, students report concerns about the volume of work required in their final-year studies; the time constraints they have to do this in; fears about the nature of their examinations, and concerns about maintaining their motivation (Frydenberg & Lewis 1998). Hesketh (1998) proposes that the application process for entry to university means that students' HSC results assume enormous importance, and this adds to their stress during the final school year.

A demanding final year of school is not unique to Australian students. Other education systems adopt assessment models similar to those offered in Australia, such as the International Baccalaureate (IB) and the Assessment and Qualifications Alliance (AQA) A level examinations. These models are similarly high-stakes in nature, and performance outcomes are used as selection criterion for entrance to tertiary and vocational education studies. The IB is offered by over 1000 schools around the world and comprises external written examinations and moderated school-based assessment tasks (Brown 2001). The United Kingdom A levels comprise written examinations and some coursework (Greatorex 2001). Given that approximately 65 000 students each year undertake the HSC in NSW alone, the number of students around the world who complete challenging final-year studies where academic performance carries important outcomes must number some hundreds of thousands.

This paper is a report of the changes that occurred in characteristics of achievement motivation in a sample of students from four schools in the Sydney metropolitan area over the course of their Year 12 studies.

Achievement motivation – learning goals

Achievement motivation can be viewed as a multidimensional construct. Students engage in a variety of processes in the educational environment and they bring with them a range of beliefs, responses and patterns of behaviour to deal with their work (Snow, Corno & Jackson 1996). These include personal learning goals and orientations, beliefs concerning competency, learning strategies, and affective responses. The situational demands of the educational setting may also impact on the achievement motivation of students.

Students view goals as not only providing the purpose for doing a task, but also as a 'schema' for approaching the task and executing it, and then evaluating their performance on the task (Maehr 2001). Goal theory proposes that students who adopt a mastery- or task-goal orientation are motivated to learn through the desire to develop their competence and master the tasks at hand. Students who adopt a performance-goal orientation, on the other hand, are motivated to learn through the desire to demonstrate their competence or ability (Ames 1984; Ames & Archer1988; Dweck & Leggett 1988).

Further development of goal theory (Elliot & Harackiewicz 1996) resulted in a differentiation of the performance goal into performance-approach and performance-avoidance orientations. Performance-approach and mastery goals are seen to represent approach orientations and entail cognitive, affective and behavioural processes that will facilitate the positive outcomes of demonstrating competence (for performance-approach goals) or improving competence or mastery (for mastery goals). The performance-avoidance goal is characterised by avoidance orientation processes that will facilitate negative outcomes such as lack of, or poor engagement with, the task. The performance-avoidance goal does not entail lack of motivation; rather, the quality of the motivation is problematic. By striving to avoid failure, students are inhibited in their immersion in an activity. Denied the positive cognitive, affective and behavioural processes, negative cognitive, affective and behavioural processes result instead.

A further differentiation between goal orientations as a function of approach and avoidance tendencies has recently been proposed by Pintrich (2000b) and Linnenbrink and Pintrich (2000). Pintrich argues that, theoretically at least, the approach-avoidance distinction can be applied to mastery goals. Linnenbrink and Pintrich (2000, p 201) describe it thus, '… approach mastery goal students want to get it 'correct' relative to the task or to their own standards and avoid mastery goal students want to avoid being 'wrong' relative to the task or their own standards'. The mastery-avoidance goal orientation may be reflective of the approaches 'perfectionist' students adopt in order to preserve their high standards or expectations of themselves. However, as Pintrich (2000b) states, there is a lack of theoretical development and empirical research that may confirm whether or not a mastery-avoidance goal orientation is tenable. The current study has been limited to a consideration of the three goal orientations discussed so far.

Academic self-efficacy

Bandura (1986, p 391) defines self-efficacy as 'people's judgements of their capabilities to organise and execute courses of action required to attain designated types of performances'. A person with a well-developed sense of self-efficacy will believe strongly in his or her capacity to carry out a task, invest effort in the activity, persist in the face of difficulty and have an optimistic outlook. Persons with a low level of self-efficacy have little confidence in their capacity to carry out a task, and this can result in avoidance of difficult tasks, low aspirations, weak commitment to goals and a pessimistic outlook (Bandura 1993; Pajares 1996).

In demanding situations, an individual's beliefs about his/her capabilities will influence affective processes such as stress, anxiety or depression (Bandura 1993). Positive affective responses usually accompany a sense of mastery and competency over a task. Perceptions of low efficacy in exercising control can give rise to anxiety and depression and, with respect to managing academic demands, students with low self-efficacy are particularly susceptible to achievement anxiety (Bandura 1993). Bandura (1986, 1997) proposes that apprehension and anxiety result when individuals perceive themselves unable to exercise control over a potentially

aversive outcome, and sadness and despondency arise when individuals perceive themselves as unable to gain a valued outcome.

Academic self-regulation

Self-regulated learning concerns the process of modifying one's learning through cognitive, behavioural and affective efforts and in response to environmental demands. Self-regulated learning is related to the motivational approaches adopted by students and is associated with deep and surface learning strategies and the cognitive processes engaged in by students to make sense of their studies. Thus, students will employ particular strategies to help them learn their schoolwork and monitor and control their learning (Wolters, Yu & Pintrich 1996).

There is ample research support for an adaptive pattern of achievement adopted by students, whereby strong engagement in self-regulated learning is positively associated with task/mastery goal orientation and academic self-efficacy. Middleton and Midgley (1997) found significant relationships between the adoption of a task-goal orientation and self-regulated learning and academic self-efficacy, but no relationship was established between performance goals (approach or avoidance) and self-regulation. However, Wolters, Yu and Pintrich (1996) found that seventh and eighth grade students who adopted either a task/mastery or a performance-approach goal exhibited a positive pattern of achievement motivation. These two goal orientations were associated with high levels of self-regulated learning strategies and academic self-efficacy. The affective measure of test anxiety was not related to the task/mastery goal but was strongly related to an extrinsic goal orientation and poor engagement with self-regulated learning practices.

Another type of achievement motivation strategy that students may employ is self-handicapping. When students are concerned about their performance, particularly in relation to others, they may engage in strategies to guard against the demonstration of a lack of ability (Covington 1992). Whilst the strategy is self-serving, it is likely to be at the expense of performance. Use of such strategies includes procrastination, deliberately not trying, or finding excuses for not studying (Pintrich 2000a). Self-handicapping serves the purpose of enabling the individual to avoid the demonstration of incompetence, and thereby maintain self-esteem.

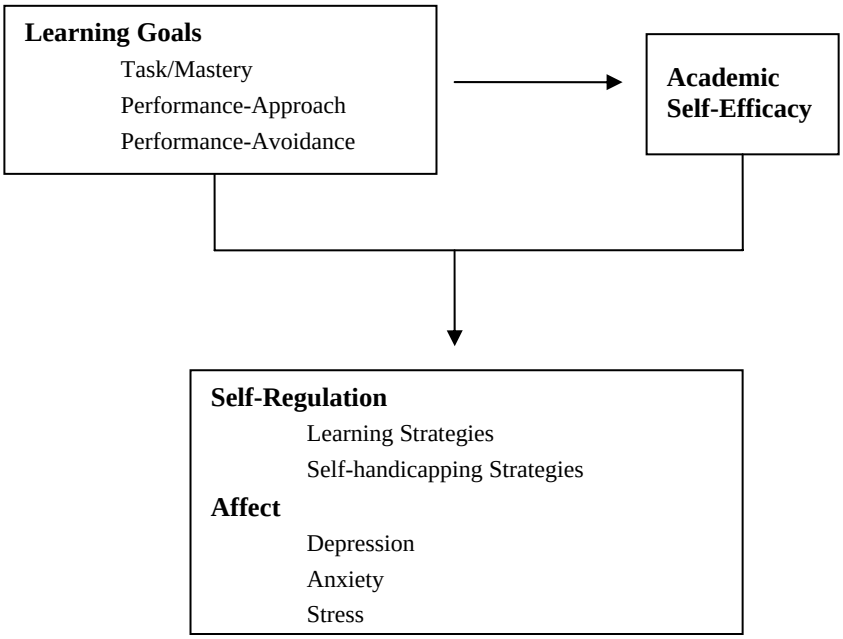
Anxiety and other affective responses, such as degree of happiness and satisfaction, have been found to accompany high levels of self-handicapping in university students (Thompson & Richardson 2001). Another study has suggested that the absence of self-handicapping may be associated with stress symptoms in highly competitive senior-school students who adopt performance-approach goals (Smith et al 2002). This may be because performance-oriented students (who do not procrastinate or use excuses for not studying) may be experiencing feelings of over-arousal, tension and irritability in their efforts to demonstrate competence in evaluative contexts.

Not surprisingly, engaging in self-handicapping strategies is not a productive approach for students to adopt towards their studies. Research shows self-

handicapping is positively related to performance goal orientations, particularly performance-avoidance, and negatively related to task goal orientation, academic self-efficacy, self-regulated learning strategies and performance outcomes (Martin, Marsh & Debus 2001; Midgley & Urdan 2001; Urdan, Midgley & Anderman 1998).

A model proposed by Anderman and Maehr (1994) illustrates these components of achievement motivation. In this model, students' learning goals influence their beliefs concerning academic self-efficacy. These two factors work together to subsequently influence self-regulation and affective responses.

Figure 1: Relationships between goals, academic self-efficacy, self-regulation and affect as proposed by Anderman & Maehr (1994)



Whilst some modifications to the model have been proposed since its initial conception – for example, differentiation of the performance goal construct (Elliot & Harackiewicz 1996) – the basic structure or framework remains, and this provides a useful vehicle for analysing the various factors associated with student achievement motivation. In the current study, this model was used as a basis for examining changes in students' motivation over the course of their final year.

It could be argued that some achievement motivation constructs may be more stable than others. For example, can it be assumed that students' goal orientations remain at the same level over the course of Year 12, despite continual assessment and important examination periods? When changes over time are considered in the context of a model of achievement motivation, what impact might these changes have on academic self-efficacy and, subsequently, self-regulation and affect? As noted, preliminary data suggest that increases may occur in the levels of depression,

anxiety and stress in Year 12 students over the course of the year (Smith & Sinclair 2000). Depending on the stage that students are at in their completion of Year 12, changes may occur for some negative affective states but not for others.

Alternatively, affective distress levels may remain at the relatively high levels reported early in the year, without any significant change over the course of the year. Thus, the stability of some achievement motivation constructs may be threatened at key points in the final year calendar. For the study reported here, repeated measures analyses were performed to investigate these issues, based on the following research question: What impact do temporal influences have on Year 12 students' achievement motivation characteristics?

Method

One co-educational, comprehensive high school from each of four regions in the Sydney metropolitan area participated in the study. These regions were selected with the purpose of including school groups in metropolitan Sydney with students from a range of cultural and educational backgrounds. Survey completion was designed to take place over three time points in the school year calendar. The first data collection in the study proper occurred early in Term 1, when no important examinations or assignments are due. By this time the students have also settled into the curriculum, which they began in Term 4, Year 11.

The second data collection took place just prior to the Trial Examination period; a traditionally demanding and stressful time for students. The final data collection took place during the period between the Trial Examinations and prior to the Final Examinations. At this point, the syllabus has been completed, students have received feedback on their Trial Examination marks (which contribute to their final HSC mark), and they are preparing for the Final Examination period (which contributes 50% of their final HSC marks).

Whilst participating schools were made aware at the start of the project of the timing of the data collections, two schools declined to participate in the second data collection (prior to the Trial Examination period). Representatives from these schools chose not to participate due to study demands of their students and lack of class time. This was not completely unexpected. It further confirms the performance pressures of the HSC year and illustrates the difficulties researchers face in studying motivation and achievement in final-year high school students. The following table displays the sample sizes for each of the data collections, and the sample sizes of the students who completed surveys at Time 1 and Time 2; Time 1 and Time 3; and Time 1, Time 2 and Time 3.

Table I: Sample sizes of individual and matched data collections

Data collection	Total N	No. of students participating in 2 or more data collections
Time 1 (March)	359	
Time 2 (July)	127	
Time 3 (September)	315	
Time 1 + Time 2		89
Time 1 + Time 3		211
Time 1 + Time 2 + Time 3		44

So that data from the surveys could be matched, students were asked to record their name on the survey document. Because this was a voluntary requirement, not all students agreed to this, thus reducing the pool of matched data. The withdrawal of two schools from the project for the Time 2 data collection also reduced the sample size. As a result of these restrictions, the sample size of Time 1–Time 2–Time 3 was too small for any meaningful statistical analysis to be undertaken. Therefore, repeated-measure MANOVAs were conducted for each of the constructs using Time 1–Time 2 and Time 1–Time 3 datasets. Although the two analyses cannot be compared because every case could not be matched, the two separate analyses provided some important information regarding the changes in students' achievement motivation that occurred at key time points of the final school year.

Students completed the questionnaire package during class time in their classrooms, supervised by their teacher and the researcher. After she was introduced to the students, the researcher first outlined the aims of the study in general terms. This information was essentially repeated in a letter students were given to take home. The researcher gave verbal instructions and these were also provided, in written form, on the front of the questionnaire. Students then completed the questionnaire at their own pace. Completing the questionnaire package took about 20 minutes.

The questionnaire comprised items designed to measure students' goal orientations, academic self-efficacy, self-regulation and self-handicapping strategies, test anxiety and affective distress (depression, anxiety and stress). The survey also contained an information sheet regarding the purpose of the study and assurances of confidentiality and voluntary participation, as well as instructions regarding how to complete the survey and demographic questions. Goal orientations, academic self-efficacy and self-handicapping strategies were measured using the appropriate scales

from the Patterns of Adaptive Learning Survey (PALS) (Midgley et al 1996, 1998). Items from the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & De Groot 1990) were utilised to measure students' test anxiety and self-regulated learning strategies. The DASS (Depression, Anxiety, Stress Scales) (Lovibond & Lovibond 1995) was employed to measure students' negative affective states. Sample items used in this study are listed in Appendix A. The factor structure and reliability of all scales was confirmed using the current study sample, and is reported elsewhere (Smith et al. 2002; Smith 2003).

Results: Time 1–Time 2

This procedure was carried out to determine any significant changes in students' achievement motivation scores between Term 1 (March) and the Trial Examination period (August). It was expected that any changes at this time point might well be different to any changes after the completion of the Trial Examination period and prior to the final Examination period (October), Time 3. Prior to the Trial Examinations (Time 2 data collection), students may be feeling more anxious and stressed concerning these examinations, the likes of which they have never undertaken before. Despite its name, the 'trial' examinations are not simply an opportunity for students to practise; these examinations contribute 25% of their total HSC marks.

Other attributes of achievement motivation may also change in association with these possible increases in negative affect. For instance, non-productive motivation may increase and productive motivation may decrease. Given the necessity of using two separate samples for Time 1–Time 2 and Time 1–Time 3, mean scores for the Time 1 achievement motivation variables for each of these samples were tested for significant differences. All tests were non-significant ($ps>.05$), indicating that the baseline scores for each sample were similar.

For the repeated measures analyses, two MANOVAs were conducted, using test occasion as the within-subjects factor and sex as the between-subjects factor. In keeping with the conceptual basis of the Anderman and Maehr (1994) model (Figure 1), possible changes in students' beliefs regarding goal orientations and academic self-efficacy were measured in one analysis. In the second analysis, the predicted outcome variables of affective distress, test anxiety and self-regulation were measured. Means and standard deviations for scores on the scales for Time 1–Time 2 are shown below in Table II.

Table II: Descriptive statistics, Time 1–Time 2.

Scale	Sex*	Time 1 Mean/*(S.D)*	Time 2 Mean/*(S.D.)*
Task goal	M	3.44/*(0.64)*	3.38/*(0.78)*
	F	3.55/*(0.79)*	3.60/*(0.82)*
	Total	3.50/*(0.73)*	3.50/*(0.80)*
Performance-approach goal	M	3.52/*(0.92)*	3.15/*(1.05)*
	F	3.54/*(0.96)*	2.74/*(1.07)*
	Total	3.53/*(0.93)*	2.92/*(1.07)*
Performance-avoidance goal	M	2.16/*(0.74)*	2.63/*(1.03)*
	F	1.90/*(0.73)*	1.95/*(0.80)*
	Total	2.02/*(0.74)*	2.25/*(0.97)*
Self-efficacy	M	3.91/*(0.73)*	3.61/*(0.72)*
	F	3.68/*(0.68)*	3.44/*(0.71)*
	Total	3.78/*(0.71)*	3.51/*(0.72)*
Depression	M	10.31/*(9.37)*	13.08/*(11.26)*
	F	12.48/*(10.46)*	14.12/*(11.22)*
	Total	11.53/*(10.00)*	13.66/*(11.19)*
Anxiety	M	6.36/*(6.71)*	8.87/(8.19)
	F	8.68/*(8.38)*	14.76/*(11.60)*
	Total	7.66/*(7.74)*	12.18/*(10.61)*

Stress	M	10.41/*(7.76)*	10.52/*(8.46)*
	F	18.08/*(11.86)*	14.81/*(11.43)*
	Total	14.72/*(10.91)*	12.93/*(10.40)*
Test anxiety	M	2.69/*(0.92)*	3.20/*(0.75)*
	F	3.14/*(1.04)*	2.93/*(0.89)*
	Total	2.94/*(1.01)*	3.05/*(0.84)*
Self-regulated learning strategies	M	3.37/*(0.53)*	3.30/*(0.61)*
	F	3.63/*(0.57)*	3.42/*(0.62)*
	Total	3.52/*(0.57)*	3.37/*(0.62)*
Self-handicapping strategies	M	2.33/*(0.90)*	2.88/*(1.12)*
	F	1.98/*(0.92)*	2.79/*(1.13)*
	Total	2.13/*(0.93)*	2.83/*(1.12)*

*Male N= 39; Female N=50

Changes in goal orientations and academic self-efficacy

As shown in Table II, students' scores for productive motivational attributes declined (for example, performance-approach goal orientation and academic self-efficacy) whilst their scores for non-productive motivational attributes increased (for example, performance-avoidance goal orientation). Based on the Pillais criterion, the MANOVA on the goal orientation scores (task; performance-approach; performance-avoidance) and academic self-efficacy indicated a significant multivariate main effect for test occasion and gender ($V=0.27$, $F(4,84)=7.84$, $p<0.05$; $V=0.21$, $F(4,84)=5.67$, $p<0.05$, respectively).

Univariate and stepdown *F*s were both used in the interpretation of this multivariate effect, given that there was a significant correlation between scores on the task, performance-approach, performance-avoidance and academic self-efficacy scales as a set (Bartlett's $\chi^2(6)= 38.06$, $p<0.05$). These were assessed at Bonferroni-corrected alpha levels ($0.05/4=0.012$) to maintain family-wise alpha at the 0.05 level. Order of entry for the stepdown procedure was determined by the perceived sensitivity of each of the variables to the stresses and strains of the academic year.

Thus, academic self-efficacy was entered first, followed by performance-avoidance goal, performance-approach goal and task goal.

The univariate ANOVAs indicated significant main effects for test occasion on students' academic self-efficacy scores ($F(1,87)=9.34$, $p<0.012$, partial $\eta=0.10$) and performance-approach goal orientation scores ($F(1,87)=19.89$, $p<0.012$, partial $\eta=0.18$), with the performance-approach goal remaining significant at stepdown ($F(1,85)=12.55$, $p<0.012$). The effects on task and performance-avoidance goal orientation scores were not significant. The performance-avoidance scores approached significance at the univariate level ($p=.014$) but were not significant at stepdown. Based on the pattern of means shown in Table II, this indicates that students' academic self-efficacy and orientation towards the performance-approach goal declined significantly from Time 1 to Time 2, and their scores on the performance-avoidance goal orientation showed an increase approaching significance. Students' task goal orientation scores did not significantly change over time.

Univariate ANOVAs indicated a significant main effect for gender on students' performance-avoidance goal orientation scores ($F(1,87)=10.97$, $p<0.012$, partial $\eta=0.11$), and this remained significant at stepdown ($F(1,86)=14.12$, $p<0.012$). From the means shown in Table II, this indicates that male students reported higher performance-avoidance goal orientation scores than females at both time points. The multivariate F for the gender by test occasion interaction effect was, however, not significant at the 0.05 level. The effect on the remaining two goal orientation scores and academic self-efficacy was not significant.

These results show that while task orientation remained fairly constant, changes in performance goals and academic self-efficacy occurred in this sample of students from Term 1 to just prior to the important Trial Examination period. Students' motivation to demonstrate their competence relative to others, along with their judgements of their competence, declined significantly across this time span. Students' motivation to avoid the demonstration of a lack of competence increased (although not significantly) during this time, with males indicating higher levels of this goal orientation across both time points compared to females. Thus, a decrease in productive achievement behaviours – and some evidence of an increase in non-productive achievement-avoidance behaviours – took place just prior to an event carrying a great deal of importance in terms of HSC outcomes.

Changes in affective distress, test anxiety and self-regulation

Based on the Pillais criterion, the MANOVA on the affective distress (depression, anxiety, stress), test anxiety and self-regulation (self-regulated learning strategies, self-handicapping) scores indicated a significant multivariate main effect for test occasion and gender ($V=0.31$, $F(6,82)=6.11$, $p<0.05$; $V=0.19$, $F(6,82)=3.29$, $p<0.05$, respectively). As there was a significant correlation between scores on the dependent variables as a set (Bartlett's $\chi^2(15)=129.16$, $p<0.05$), univariate and stepdown Fs were both used in the interpretation of this multivariate effect. These were assessed at Bonferroni-corrected alpha levels (0.05/6=0.008) to maintain family-wise alpha at

the 0.05 level. In the stepdown analysis, the respective order of entry for the six dependent variables was depression, anxiety, stress, self-handicapping, self-regulated learning strategies, and test anxiety.

Given the imminence of a major examination period, the test anxiety variable was entered last so that the effects of this variable over and above the effects of the other variables could be determined. The three affective distress variables of depression, anxiety and stress were entered first, second and third in the procedure given that the potential stresses and strains of the school year may have taken their toll and, as such, may be the most sensitive to any changes in scores. The 'self' variables of self-handicapping and self-regulation were thus entered next.

The univariate ANOVAs indicated significant main effects for test occasion on students' anxiety and self-handicapping scores ($F(1,87)=15.66$, $p<0.008$, partial $\eta=0.15$; $F(1,87)=25.55$, $p<0.008$, partial $\eta=0.23$, respectively), and these remained significant at stepdown ($F(1,86)=11.35$, $p<0.008$; ($F(1,84)=11.76$, $p<0.008$, respectively). The effects on depression, stress, self-regulated learning strategies and test anxiety were not significant at the univariate level. Based on the pattern of means shown in Table II, this indicates that students' anxiety and self-handicapping scores increased significantly from Time 1 to Time 2, whilst their scores on the depression, stress, self-regulated learning strategies and test anxiety did not significantly alter over time.

Univariate ANOVAs also indicated a significant main effect for gender on the stress variable ($F(1,87)=11.49$, $p<0.008$, partial $\eta=0.12$), and this remained significant at stepdown ($F(1,85)=9.36$, $p<0.008$). The remaining univariate results for gender were non-significant at the 0.008 level. From the means shown in Table II, this indicates that female students reported higher stress scores than males at both time points. The multivariate F for the gender by test occasion interaction effect was non-significant at the 0.05 level.

The results of this repeated measures analysis indicate significant increases in anxiety and self-handicapping from the beginning of the school year to prior to the Trial Examination period. As expected, there were also significant gender differences on the stress variable, although there were no significant gender differences on the other affective distress variables.

Results: Time 1–Time 3

Any changes in student motivation following the Trial Examinations may well be different to those changes prior to the Trial Examinations. This is because, once this examination period is completed, students are no longer experiencing pre-examination anxieties and have received feedback. Students receive their marks and many of them request a predicted UAI (Universities Admission Index) based on the results of their assignments and examinations marks to date. This gives them an indication of their overall performance up until that point and an indication of what they might expect for their total HSC marks. Thus, for some students, expectations have been met or even exceeded at this stage of the year. For others, desired marks

have not been realised. Also at this stage, students need to rally their resources for the final period of study prior to the external examinations in October.

To determine whether or not students' scores on the goal orientation, academic self-efficacy, affective distress and self-regulation scales changed significantly between Term 1 and prior to the Final Examination period, two multivariate repeated measures analysis of variance were performed. Test occasion was used as the within-subjects factor and sex as the between-subjects factor, and the same sets of variables were used for each of the analyses conducted for the Time 1–Time 2 procedure. Means and standard deviations for scores on the scales for Time 1–Time 3 are shown in Table III below.

Table III: Descriptive statistics, Time 1–Time 3.

Scale	Sex*	Time 1 Mean/*(S.D)*	Time 3 Mean/*(S.D.)*
Task goal	M	3.32/*(0.72)*	3.40/*(0.74)*
	F	3.39/*(0.73)*	3.34/*(0.71)*
	Total	3.35/*(0.72)*	3.38/*(0.72)*
Performance-approach goal	M	3.57/*(0.87*)	3.55/*(0.84)*
	F	3.71/*(0.82)*	3.63/*(0.81)*
	Total	3.64/*(0.84)*	3.59/*(0.82)*
Performance-avoidance goal	M	2.20/*(0.83)*	2.42/*(0.86)*
	F	2.25/*(0.77)*	2.26/*(0.70)*
	Total	2.22/*(0.80)*	2.34/*(0.79)*
Self-efficacy	M	3.98/*(0.61)*	3.74/*(0.64)*
	F	3.68/*(0.75)*	3.59/*(0.74)*
	Total	3.84/*(0.69)*	3.67/(0.69)

Depression	M	11.84/*(9.68)*	13.52/*(10.06)*
	F	13.76/*(9.17)*	16.08/*(9.99)*
	Total	12.73/*(9.47)*	14.71/*(10.09)*
Anxiety	M	8.42/*(8.25)*	9.61/*(9.64)*
	F	9.86/*(8.41)*	10.80/*(9.51)*
	Total	9.09/*(8.33)*	10.16/*(9.58)*
Stress	M	11.65/*(8.70)*	13.84/*(10.62)*
	F	18.24/*(9.94)*	18.89/*(10.15)*
	Total	14.71/*(9.84)*	16.19/*(10.68)*
Test anxiety	M	2.88/*(0.87)*	3.06/*(0.68)*
	F	3.29/*(0.87)*	3.39/*(0.81)*
	Total	3.07/*(0.89)*	3.22/*(0.76)*
Self-regulated learning strategies	M	3.45/*(0.61)*	3.45/*0.60)*
	F	3.57/*(0.57)*	3.59/*(0.62)*
	Total	3.50/*(0.59)*	3.52/*(0.61)*
Self-handicapping strategies	M	2.03/*(0.88)*	2.14/*(0.89)*
	F	2.13/*(0.90)*	2.07/*(0.85)*
	Total	2.08/*(0.89)*	2.11/*(0.87)*

*Male N=113; Female N=98

Changes in goal orientations and academic self-efficacy

Based on the Pillais criterion, the MANOVA on the goal orientation scores (task; performance-approach; performance-avoidance) and academic self-efficacy indicated a significant multivariate main effect for test occasion and gender ($V=0.08$, $F(4,206)=4.64$, $p<0.05$; $V=0.08$, $F(4,206)=4.26$, $p<0.05$, respectively).

Given that there was a significant correlation between scores on the dependent variables as a set (Bartlett's $\chi^2(6)=153.65$, $p<0.05$), univariate and stepdown Fs were both used in the interpretation of this multivariate effect. These were assessed at Bonferroni-corrected alpha levels (0.05/4=0.012) to maintain family-wise alpha at the 0.05 level. The order of entry for this stepdown procedure was the same as that used for the Time 1–Time 2 analysis.

The univariate ANOVAs indicated significant main effects for test occasion on students' academic self-efficacy ($F(1,209)=15.38$, $p<0.012$, partial $\eta=0.08$). The effects on task, performance-avoidance and performance-approach goal orientations were not significant. Based on the pattern of means shown in Table III, this indicates that academic self-efficacy scores decreased from Time 1 to Time 3, whilst students' goal orientation scores did not significantly change over time.

Univariate ANOVAs also indicated a significant main effect for gender on academic self-efficacy ($F(1,209)=7.17$, $p<0.012$, partial $\eta=0.03$). The effect on all three goal orientation scores was non-significant. From the means shown in Table III, this indicates that male students reported higher academic self-efficacy scores than females across the time points. The multivariate F for the gender by test occasion interaction effect was non-significant at the 0.05 level.

These results suggest that, in a high performance-demanding context such as the HSC, students' goal orientations do not change when scores prior to the Final Examinations are compared to scores in Term 1. Thus, although performance-approach scores reported here significantly decreased and performance-avoidance scores marginally increased prior to the Trial Examinations, for the Time 1–Time 3 sample of students, goal orientations appear to be stable constructs. These achievement goals are also not gender-dependent. The repeated measures results suggest (as was found in the Time 1–Time 2 analyses) that academic self-efficacy, on the other hand, declines significantly over time for males and females.

Changes in affective distress, test anxiety and self-regulation

Based on the Pillais criterion, the MANOVA on the affective distress (depression, anxiety, stress), test anxiety and self-regulation (self-regulated learning strategies, self-handicapping) scores indicated a significant multivariate main effect for test occasion and gender ($V=0.06$, $F(6,204)=2.09$, $p<0.05$; $V=0.15$, $F(6,204)=6.16$, $p<0.05$, respectively). Given that there was a significant correlation between scores on these variables as a set (Bartlett's $\chi^2(15)= 410.53$, $p<0.05$), univariate and stepdown Fs were both used in the interpretation of this multivariate effect. These were assessed at Bonferroni-corrected alpha levels (0.05/6=0.008) to maintain family-wise alpha at the 0.05 level. The order of entry for the stepdown procedure remained the same as that used for the Time 1–Time 2 analysis.

The univariate ANOVAs indicated significant main effects for test occasion on students' depression scores ($F(1,209)=8.68$, $p<0.008$, partial $\eta =0.04$), and this remained significant at stepdown. The effects on anxiety, stress, self-handicapping, self-regulated learning strategies and test anxiety were not significant at the

univariate level. The test anxiety variable approached significance at the univariate level (p=0.013), however, this was not significant at stepdown. Based on the pattern of means shown in Table III, this indicates that students' depression scores increased significantly from Time 1 to Time 3, whilst their scores on the other variables – affective distress, test anxiety and self-regulation – did not significantly alter over time, although there was a marginally significant increase in test anxiety scores at the univariate level.

Univariate ANOVAs also indicated a significant main effect for gender on stress (F(1,209)=24.99, p<0.008, partial η=0.11) and test anxiety (F(1,209)=14.12, p<0.008, partial η=0.06). The significant gender effect on the stress variable remained significant at stepdown (F(1,207)=29.33, p<0.008). The effect on test anxiety at stepdown was not significant. The remaining univariate results were non-significant at the 0.008 level. From the means shown in Table III, this indicates that female students reported higher stress and test anxiety scores than males across the time points. The multivariate F for the gender by test occasion interaction effect was non-significant at the 0.05 level.

These results indicate significant increases in depression from the beginning of the school year to just prior to the final examinations. There were no other significant changes in the remaining variables (except for a marginal increase in test anxiety scores). This may seem surprising given the apparent stresses imposed by the final year of school study. However, in the light of normative data indicating high levels of depression, anxiety and stress reported by students (Hodge et al 1997; Smith & Sinclair 2000), it is possible that negative affective distress is a pervasive feature of the final year of school and does not simply emerge towards the end of the year.

Discussion

Some interesting findings emerge from the Time 1–Time 2 comparisons. There were significant increases in anxiety and self-handicapping strategies, with a concomitant decline in the performance-approach goal and academic self-efficacy and some fear of demonstrating a lack of ability relative to others. Thus, as the Trial Examinations approached, students became more anxious and less sure of themselves. None of these characteristics is conducive to enhancing learning or performance. A notable exception to these fluctuations in achievement motivation was the sustained level of students' task goal orientation. In spite of these increasing pressures, students' desire to understand school work and develop competence remained stable. This stability may also be indicative of teachers resisting a performance focus to school work in this final year.

An important aspect of the findings of the Time 1–Time 2 repeated measures analysis is the concomitant increase in anxiety and decrease in academic self-efficacy experienced by students. Bandura (1986, 1997) argues that anxiety may result when individuals perceive themselves unable to exercise control over a potentially aversive outcome. Thus, if final-year students have doubts about their ability to master the skills they need in order to attain valued outcomes, they may

experience distressing levels of anxiety. At this time point (just prior to the Trial Examination period), Year 12 students have not yet experienced the nature of HSC examinations. It would be difficult for students to feel highly confident about their ability to undertake these types of examinations without prior experience. In other words, their sense of personal control over this important event in their final year of studies would be vulnerable. In light of the importance of students' performance in their Trial Examinations, it can be seen that anxiety may result.

The non-significant increases in test anxiety further suggest that this anxiety may be a more global and pervasive affective experience. In terms of the DASS anxiety scale items, students in this sample reported experiencing an increase in autonomic arousal (for example heart rate, breathing difficulty, dryness of the mouth); worrying about being close to panic; and feeling scared without good reason.

The outcomes of the repeated measures analyses for Time 1–Time 3 also reveal some interesting findings. In the first analysis, academic self-efficacy decreased significantly over time and, in the second analysis, depression increased significantly over time. As Bandura (1986, 1997) suggests, when individuals believe that they are unable to attain a desired outcome, sadness and despondency can result. By the time the Final Examination period begins, students have received their results on their trial examinations and assignments completed during the course of the year, which together carry a 50% load towards final HSC marks. If students have not attained the results they desired by this stage, they may experience an erosion in confidence in their ability to achieve the desired outcome (such as the necessary HSC results to gain them entry to a chosen career path). Consequently, an increase in feelings of hopelessness, dysphoria or other symptoms of depression may occur.

The changes in academic self-efficacy and affective distress in the two datasets are consistent with associated changes in other achievement motivation attributes. As noted, they are also consistent with theory (Bandura 1986, 1997). The increases in anxiety observed at Time 1–Time 2 were consistent with reduced performance-approach and increased performance-avoidance and self-handicapping scores reported in the same dataset. It is not clear why anxiety and stress scores did not increase significantly from Time 1 to Time 3. However, from a theoretical perspective (Bandura 1986, 1997), it could be hypothesised that increases in anxiety and stress scores were not evident in the Time 1–Time 3 analyses because students had, by the time of the third data collection, received feedback on assignments and examinations and had thus gained some personal control or understanding of the experience. Concerns about performance have generally passed by this stage. The significant increases in depression scores for this dataset, on the other hand, may have resulted due to students receiving feedback regarding their marks for this performance that did not match their expectations.

Overall, the most consistent changes occurred in the areas of affective distress and academic self-efficacy. Students' confidence in their ability to undertake and execute academic tasks declined. This was associated with increases in symptoms of anxiety or depression. This is a significant finding in light of existing

research evidence indicating the importance of strong academic self-efficacy to productive student motivation and psychological well-being (Bandura 1997; Pajares 1997; Zimmerman 2000).

Gender effects were also evident. Whilst the female students reported higher levels of affective distress, they did not, like the male students, engage in increased use of avoidance behaviours (such as performance-avoidance goal orientation or self-handicapping strategies) when meeting performance demands. When considered in the light of the Anderman and Maehr model of achievement motivation (1994) used for this study, the effect of gender thus appears to be an integral component. Models that do not incorporate gender as a moderating factor may be inadequate in their capacity to explain or predict aspects of students' motivation. However, it should be remembered that contextual influences are operating here such that, whilst gender appears to be a significant factor in competitive, Year 12 achievement situations, this may not be applicable in other achievement situations.

Previous research has indicated significant gender differences in affective and motivational attributes amongst HSC students (Hodge, McCormick & Elliott 1997; Smith & Sinclair 2000). In the light of these findings and those of the current study, two points of interest arise: firstly, to what extent do these gender differences influence students' academic performance in the HSC; and secondly, what is the nature of the motivational pathways to achievement that female and male students take in the pursuit of their studies? Gaining some insight to these issues would be of value to teachers and researchers.

Conclusions

To conclude, caution must be exercised with respect to comparing separate datasets, and the differences found between the two sets of analyses may simply reflect differences in sample characteristics. Nevertheless, there is evidence to suggest that the pressures of final-year studies may lead to an increased preoccupation with the negative effects of seeking to avoid failure, at least prior to the Trial Examinations. In particular, students experience a decline in orientation towards demonstrating ability in favour of a tendency towards avoiding the demonstration of a perceived lack of ability, and these changes are associated with an increase in the use of self-handicapping strategies and a decrease in feelings of self-efficacy. These results also suggest that, in a high-stakes, normatively oriented environment, students experience an increase in affective distress responses, particularly anxiety and depression.

The results of these repeated measures tests raise important questions regarding the Year 12 learning environment. What is happening over the final year of school to cause a decline rather than an increase in academic self-efficacy? Presumably, educators aim to build students' confidence in their academic abilities rather than erode it. The significant increases in affective distress that accompany this decline in academic efficaciousness highlight the deleterious effects of weak perceptions of academic self-efficacy. In schools' eagerness to 'teach to the test' (McGaw 1996) and reach commendable performance outcomes, maintaining a focus

on building confidence may have taken a back seat. As Lazarus and Folkman (1984) note, when a potentially stressful event is appraised as high-stakes, and when perceptions of personal control are low, affective distress is likely to result. This may well apply for final-year HSC students. The importance conferred upon the HSC, with its normative nature and strict time limit for completing the curriculum, make this a demanding final year of school indeed.

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Appendix A – Sample items for self-report scales

1) Patterns of adaptive learning survey

Task goal	I do my school work because I'm interested in it
Performance approach goal	I want to do better than other students in my class
Performance avoidance goal	The reason I do my work is so others won't think I'm dumb
Academic self-efficacy	I can do even the hardest work in class if I try
Academic self-handicapping	Some students fool around the night before a test, so that if they don't do well, they can say that is the reason. How true is this of you?

2) Motivated Strategies for Learning Questionnaire

Learning strategies	I ask myself questions to make sure I know the material I have been studying
Test anxiety	I have an uneasy, upset feeling when I take a test

3) Depression, Anxiety, Stress Scales

Depression	I felt down-hearted and blue
Anxiety	I was aware of dryness of my mouth
Stress	I found it hard to wind down