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Running head: FACTORS PREDICTING ACADEMIC PERFORMANCE

Who Succeeds at University?

Factors Predicting Academic Performance in

First Year Australian University Students

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Abstract

With the increasing diversity of students attending university, there is a growing interest in the factors predicting academic performance. This study is a prospective investigation of the academic, psychosocial, cognitive, and demographic predictors of academic performance of first year Australian University students. Questionnaires were distributed to 197 first year students 4 to 8 weeks prior to the end of semester exams and overall grade point averages were collected at semester completion. Previous academic performance was identified as the most significant predictor of university performance. Integration into university, self efficacy, and employment responsibilities were also predictive of university grades. Identifying the factors that influence academic performance can improve the targeting of interventions and support services for students at risk of academic problems.

Over the last decade, higher education in Australia has seen a shift from elite to mass education. With the reforms of the late 1980's, equity and access for all have been a primary focus of Australian universities. In a review of higher education, West (1998) stated "central to the vision is ensuring that no Australian is denied access to a high quality of education at any level merely because of his or her social background or financial circumstances" (p. 2). The Organisation for Economic Cooperation and Development (1997) reported that between the years from 1983 to 1995, university enrolments in Australia rose by 70 per cent.

Accompanying this growth in higher education is an increasing diversity amongst the student population. Students from different social and cultural backgrounds, with different experiences and varying levels of education bring with them different needs and academic potential. The challenge for Australian universities is to recognise this diversity of needs and cater for this changing and heterogeneous population of students. Power, Robertson, and Baker (1987) stated "the stress should not only be on admitting a wider range of students, but also on giving them the support and help needed to ensure a reasonable chance of success" (p. 3).

The aim of this study was to undertake a prospective investigation of the academic, psychosocial, cognitive, and demographic predictors of academic success in an Australian university context. A broad range of factors were examined in recognition of the diversity of student needs. This study examined the major predictors of academic success identified in previous research, with a view to developing a model which could be used to identify students at risk of academic problems.

Prospective research of this kind is crucial during the current changes that Australian higher education is undergoing. This research has implications for both university policy and student support services. Through identifying the factors that

influence the academic performance of students, universities are better equipped to target interventions and support services to meet the needs of at risk students, with a view to optimising the retention of students and maintaining standards.

The sections following will provide a review of previous research on academic, psychosocial, cognitive and demographic predictors of academic performance.

Academic Predictors of Academic Performance

The two major academic predictors of performance at university identified in the literature are previous academic performance and study skills.

An extensive amount of research has shown support for the relationship between previous academic performance and university performance (Baker and Siryk, 1984; Clark and Ramsay, 1990; Everett and Robins, 1991; Gerdes and Mallinckrodt, 1994; Pascoe, McClelland, and McGaw, 1997; Power, Robertson, and Baker, 1987). Power, Robertson, and Baker (1987) reported that the correlation between secondary school grades and Grade Point Average (GPA) at university is generally about 0.5.

However, the predictive capacity of secondary school grades is different for different individuals and groups. Power, Robertson, and Baker (1987) found that secondary school grades are not as good predictors for mature age student's performance as they are for school leaver's performance, and female students with the same secondary school grades as male students consistently outperform their male counterparts (p. 12 – 13). The method of entry into university and the ease with which entry could be made into university has also been found to affect the predictive capacity of secondary school grades (Pascoe, McClelland, and McGaw, 1997). Previous academic performance does not sufficiently account for the variability in student's university grades. Other academic factors such as study skills have been found to affect university grades.

Study skills have been found to influence academic performance. Pantages and

Creedon (1975) found that students with poor study habits are more likely to withdraw from university or to have academic adjustment problems in the transition from high school to university. Abbott-Chapman, Hughes, and Wyld (1992) found that “those students classified as “academics”, for instance, whose profiles include an active “liking for study”, are more likely to perform well at university than those students who don’t have this motivation” (p. 17).

Fortunately, study skills are not absolute and unchangeable. Study skills can be improved through training and courses and therefore lead to improved GPA's. Cone and Owens (1991) found that students who participated in a study skills course obtained higher GPA's than predicted by previous academic performance. Cone and Owens (1991) stated “college freshman who are deficient in basic study skills are likely to become highly anxious in their new academic setting thereby further impairing their potential for academic success" (p. 1211). This study must be interpreted with caution, as the researchers neglected to measure study skills prior to or following the study skills course. Improvement in student’s GPA’s may be due to other factors associated with participation in the course.

Two academic factors have been highlighted as predictive of university success: secondary school grades and study skills. These variables have been found to contribute moderately to this prediction. Secondary school grades explain the largest portion (approximately 0.5) of the variance in GPA, with several studies showing study skills explain a small amount of unique variance over and above this. Thus, other factors must be important in the prediction of university success if academic factors account for no more than half of the variance in GPA.

Psychosocial Predictors of Academic Performance

There is a vast body of research that highlights the importance of psychosocial

variables in predicting academic performance (Gerdes and Mallinckrodt, 1994; Lecompte, Kaufman, and Rousseeuw, 1983; Lecompte, Kaufman, Rousseeuw, and Tannin, 1983; Rickinson and Rutherford, 1995; Rickinson and Rutherford, 1996; Terenzini and Pascarella, 1978; Tinto, 1975; Wince and Borden, 1995). Several psychosocial predictors of academic performance have been identified: student institution integration, commitment to university, satisfaction with university, financial difficulty, career orientation, social support, and psychological health.

A major contributor to the study of the relationship between psychosocial factors and academic performance is Vincent Tinto. Tinto (1975) developed a student integration model which emphasises the academic and social integration, and the educational and institutional commitment of the student as the most important predictors of student attrition. Academic and social integration are defined as “a subjective sense of belonging and fitting in....a sense of compatibility or dissonance with the University and its students” (Spady, 1971, p. 44). The model suggests that a match between the academic ability and motivation of the student with the social and academic qualities of the institution foster academic and social integration into the university system. This leads to the development of two commitments: an educational commitment and an institutional commitment. Commitment refers to both the degree of importance the student places on achieving their academic and career goals, and the degree to which the student identifies and is committed to the university at which they are studying. According to the model, if the student is not integrated into the university, they will develop a low commitment to university. While this model does not deny the academic history of the student, it does not see academic history as predictive of student withdrawal. Instead, academic history influences the process of student integration. It is the degree of integration and commitment experienced by the student that influences that student’s decision to withdraw or continue their

university education.

Tinto's model has gained considerable support in the literature. Terenzini and Pascarella (1978) found the most significant predictors of student attrition were academic and social integration variables, with previous academic performance and personality variables accounting for only four percent of the variance in attrition status. Power, Robertson, and Baker (1987) established "the most important variable distinguishing between those who proceed successfully to second year and those who dropout or fail, is course commitment"(p. 40). Lecompte, Kaufman, and Rousseeuw (1983) discovered the less students made use of student services (academic/social integration), the more likely a student was to withdraw from university.

However, the prediction that social integration is associated with academic achievement is arguable. Research has shown that social integration into the university is not necessarily beneficial for achieving high grades. McInnis, James and McNaught (1995) found a higher percentage of students achieving average marks worked in social groups to study, while students achieving the highest and lowest marks were less social in their academic work. Tinto (1975) also recognised that social integration is not always beneficial for academic achievement:

Insufficient social interaction seems to lead primarily to voluntary withdrawal, whereas excessive social interaction may, in some cases, lead to dropout if the group with whom one associates is itself disinclined toward academic achievement.
(p. 109)

Unfortunately, Tinto's model does not take this recognition of the harms of social integration into account, offering a more generalised explanation of student attrition. This general view does not fit for all students. McInnis, James and McNaught (1995) explain "In some student cultures, social integration is contingent on not being diligent – being a

'conch' (conscientious student), or at least, a certain type of 'conch', can be a social liability"(p. 39).

Research has also shown that other psychosocial factors influence academic performance. These include satisfaction with university, financial situation, career orientation, and social support. Rickinson and Rutherford (1996) found dissatisfaction with the course of study was the reason most commonly endorsed for leaving university. Wince and Borden (1995) found satisfaction with university was related to both higher GPA's and lower withdrawal rates.

Lecompte, Kaufman, and Rousseeuw (1983) found financial difficulties was also a common reason for leaving university. However, Lecompte, Kaufman, Rousseeuw, and Tassin (1983) found financial difficulty was not significantly related to academic performance. Other studies have also found a negative correlation between financial difficulties and student retention (Braxton, Brier, and Hossler, 1988; Pantages and Creedon, 1975), but few studies have examined the relationship between financial difficulties and academic performance.

In terms of career orientation, Himmelstein (1992) reported that students with a clear career orientation achieved higher GPA's and were less likely to withdraw from university than students lacking a clear career orientation. Williams (In McInnes, James and McNaught, 1995) found students with clear objectives for university were more likely to achieve higher grades than those students with undefined objectives (p. 28).

Social support has also been found to influence academic performance. Several researchers have found that the presence of a person who provides strong support and support from family or spouse are important predictors of student retention and academic success (Gerdes and Mallinckrodt, 1994; Pantages and Creedon, 1975; Tracey and Sedlacek, 1982).

Psychological health variables have gained a limited amount of attention in the academic performance literature. Few studies have included measures of psychological health as variables in academic performance research, and even fewer have looked solely at the relationship between psychological health and academic performance. The findings from these studies support the relationship between psychological health and academic performance.

Houston (1971) and Lecompte, Kaufman, Rousseeuw, and Tassin (1983), in a prospective study, found that student's reporting high anxiety at the start of the academic year had significantly poorer grades at the end of the academic year than their less anxious peers. Lecompte, Kaufman and Rousseeuw (1983) found that student's experiencing more frequent episodes of depression had a higher dropout rate than students experiencing fewer depressive episodes. Szulecka, Springett, and de Pauw (1987), also utilising a prospective methodology, found that higher levels of psychological disturbance, such as depression, anxiety and somatic complaints, were related to a significantly higher incidence of withdrawal from university.

Cognitive Appraisal as a Predictor of Academic Performance

Cognitive appraisal research tends to fall into one of two categories in academic performance literature: studies of self efficacy and studies of attributional style. Self-efficacy needs to be distinguished from attributional style.

Self-efficacy refers to "the belief's about one's ability to perform successfully a given task or behaviour" (Lent, Brown and Larkin, 1987, p. 293). In academic performance literature, self efficacy has referred to a belief that one will achieve good grades in a given course or subject (Gerdes and Mallinckrodt, 1994; Lecompte, Kaufman, and Rousseeuw, 1983; Lecompte, Kaufman, Rousseeuw, and Tassin, 1983; Lent, Brown and Larkin, 1984, 1987).

Attributional style refers to a general appraisal of events and a belief about the causes of events. From an attributional style perspective, individuals explain events in terms of internality, stability, and pervasiveness, and the way individuals explain events can be used to classify people as optimists or pessimists (Peterson and Barrett, 1987; Pierce and Henry, 1993). In academic performance literature, attributional style has been examined in relation to the characteristics of high and low achievers, that is, are they optimists or pessimists in their orientation to the world in general.

Thus, attributional style is a general appraisal of events in terms of the dimensions of pessimism and optimism, whereas self-efficacy is a belief about one's ability in terms of a specific event such as achieving high grades in a course. While it is recognised that there is some similarity between the two aspects of cognitive appraisal, the distinction between self-efficacy as specific appraisal and attributional style as general appraisal will be used in this research.

Self-efficacy has been found to be predictive of university grades. A belief that one will perform successfully in a given course predicts actual successful performance in that course. Lent, Brown and Larkin (1987) found "self-efficacy added significant unique variance beyond measures of objective ability and achievement in predicting subsequent academic performance and persistence" (p. 293). Lecompte, Kaufman, Rousseeuw, and Tassin (1983) and Lecompte, Kaufman, and Rousseeuw (1983) found that an expectation of academic success (self-efficacy) has a highly significant positive relationship with actual academic success and with low withdrawal rates. Gerdes and Mallinckrodt (1994) reported students with high grades were more confident about their own ability to achieve academic success than students with poor grades and withdrawers from university.

One of the more recent trends in academic performance research has focused on attributional style as a predictor of academic achievement. Attributional style has its roots

in the theory of 'learned helplessness' (Abramson, Seligman, and Teasdale, 1978).

"Learned helplessness is the giving up reaction, the quitting response that follows from the belief that whatever you do does not matter" (Tominey, 1996, p. 5).

Pierce and Henry (1993) explain attributional theory in terms of pessimism and optimism:

According to this reformulated learned helplessness theory, those who attribute failure to internal-stable-global causes have a pessimistic attributional style and are more likely to display symptoms associated with learned helplessness such as not trying when faced with failure. Those who attribute failure to external-unstable-specific causes have an optimistic attributional style and are expected to continue to work in the face of failure. (p. 5)

Little research has been undertaken in the area of attributional style and academic success within a general university student populations. A study by Peterson and Barrett (1987) utilising a small sample of 87 first year students examined attributional style and academic performance in a university population. They found a significant negative relationship between pessimistic attributional style and first year GPA.

Attributional style has been found to significantly predict grades over and above that predicted by traditional academic measures. Seligman (1991) measured student's attributional styles upon entering university and found that optimistic students achieved significantly better grades than predicted by the traditional measures (high school grades and achievement tests) and pessimistic students did more poorly than predicted by traditional measures.

A caveat to some of these studies is the use of an academic modification of the ASQ. This measure of attributional style was developed and used by Peterson and Barrett (1987) without evidence of testing the psychometric properties of the measure. Since then,

other studies have also used the academic version of the ASQ without any reported evidence of the measure having sound psychometric properties (reliability or validity).

The academic modification of the ASQ used in some studies cites only negative events, unlike the original ASQ that cites both negative and positive events. The negative slant of the academic version of the ASQ may influence the results in a more pessimistic direction than would be expected from the ASQ. Many studies have reported that the ASQ dimension of CoNeg (total of all negative events) produces more significant results than the often insignificant ASQ dimension of CoPos (total of all positive events) (Pierce and Henry, 1993; Seligman and Schulman, 1986; Tominey, 1996). Thus, the academic version of the ASQ in measuring only the negative side of attributional style, may unduly influence the significance of the results.

Demographic Predictors of Academic Performance

Demographic variables that have been found to be important influences on academic performance are age, gender, employment responsibilities, and student workload. Studies have reported inconsistent results when measuring the relationship between age and academic achievement. Some studies show a significant negative relationship between age and academic achievement, in that school leavers achieve higher results and are more likely to persist at university than mature age students (Clark and Ramsay, 1990; Pantages and Creedon, 1975). Other studies have found that mature students, having a clearer career orientation and lower integration needs, are more likely to achieve higher academic results (McInnis, James and McNaught, 1995).

Employment responsibilities have been found to influence student retention. Pantages and Creedon (1975) found full-time students who worked more than 15 hours per week were more likely to withdraw than full-time students who worked less than 15 hours per week. McInnis, James and McNaught (1995) state: “The pressures of part-time, and in

a minority of cases, full-time work, make it extremely difficult for some students to fulfil course expectations” (p. 69). There has been little research into the effect of employment on academic performance, but it could be argued that full-time students with greater employment responsibilities would not perform as well as full-time students with little or no employment responsibilities.

There has been little research examining the influence of student workload on academic performance. While research has identified that part-time students are often less integrated into university (McInnis, James and McNaught, 1995), research on part-time students has not been expanded to examine academic performance.

Rationale for Study

Little prospective research has been undertaken on the predictors of academic performance which integrates both academic and non-academic predictors. The majority of studies have employed a cross-sectional or retrospective methodology. Research tends to focus on the relationship between academic performance and one of the three broad areas of academic factors, psychosocial factors, or cognitive appraisal. The few studies that have examined more than one of these areas have been directed at the study of student attrition rather than academic performance (Gerdes and Mallinckrodt, 1994; Pascarella, Duby, Miller, and Rasher, 1981; Spady, 1971; Terenzini and Pascarella, 1978; Tinto, 1975). The majority of these studies have been based on Tinto’s Student Integration Model, which has been criticised and contradicted by some researchers (McInnis, James and McNaught, 1995; McKeown, Macdonell, and Bowman, 1993). The influence of demographic variables is often excluded, or not examined adequately in many studies. There has been no systematic research which examines both academic and non-academic predictors of academic performance and the relationship between these predictors. Moreover, there has been little published research of either academic or non-academic

predictors, let alone an integration of these, performed within an Australian tertiary context.

This prospective study will examine the relationship between academic, psychosocial, cognitive, and demographic variables, and the academic performance of first year Australian university students. The variables are based on factors identified in previous research as being important predictors of academic performance. Academic performance is based on the first semester Grade Point Average (GPA) of students. The aim of the study is to identify the variables within each of the four factors that affect academic performance, with a view to develop a model which could be used to identify students at risk of academic problems. Based on previous research, several hypotheses are proposed.

1. Higher grades in secondary school and well developed study skills will be associated with higher university grades
2. Integration, commitment, satisfaction with university, social support, lack of financial difficulty, and a clear career orientation will be related to higher university grades.
3. Psychological health will be related to higher university grades.
4. High self efficacy and optimism will be related to higher university grades.
5. Full-time students with limited employment responsibilities will have higher GPA's than full-time students with more demanding employment responsibilities.

Method

Participants

A sample of 197 first year university students from the Faculties of Science (n = 149) and Information Technology (n = 48) in a large urban commuter-based university volunteered to participate in the study. The sample included 103 males and 94 females

with a mean age of 21.24 years.

Materials

A questionnaire was developed to measure academic variables, psychosocial variables, cognitive appraisal, and some demographic variables. The academic variable that was measured in the questionnaire was self reported study skills. Self reported study skills were assessed using the Academic Problems sub-scale from the College Adjustment Scales Inventory. This scale measures the extent of difficulties students experience in regard to academic performance. The sub-scale has a reported internal consistency of .87 (Anton and Reed, 1991).

The psychosocial variables that were measured in the questionnaire were commitment to university, student-institution integration, satisfaction with university, career orientation, financial difficulties, social support, and psychological health. These questions were rated along a 4 point likert scale from “did not apply to me” (0) to “applied to me very much or most of the time” (3). Most of the questions pertaining to student-institution integration and commitment, social support, financial situation, and career orientation were adapted from Himelstein’s (1992) questionnaire used to identify students at risk of withdrawal and/or failure.

While the psychometric properties of the questionnaire were not reported, Himelstein (1992) found student’s indicating the statements applied to them very much, had higher rates of course completion and higher GPA’s than students who indicated low applicability. The remainder of these questions were based on factors that previous research has indicated are predictive of academic performance (Gerdes and Mallinckrodt, 1994; Lecompte, Kaufman and Rousseeuw, 1983; Pantages and Creedon, 1975; Wince and Borden, 1995).

The psychosocial variable of psychological health was assessed using the short

version (21 items) of the Depression, Anxiety and Stress Scale (DASS) (Lovibond and Lovibond, 1995). The depression sub-scale assesses lack of positive affect, low self esteem, and feelings of hopelessness; the anxiety sub-scale assesses hyperarousal, nervousness, and apprehension; and the stress sub-scale assesses feelings of frustration, irritability, and tension (Brown, Chorpita, Korotitsch, and Barlow, 1997). The sub-scales of the short version consist of 7 items for which participants rate themselves along a 4 point severity/frequency likert scale. Scores are summed, multiplied by two, and compared to Australian norms to provide an indication of the degree of stress, anxiety, and depression experienced by the participants. Internal consistency of the sub-scales of the DASS is high (Cronbach's alpha = .96, .89, and .93 for depression, anxiety, and stress respectively) (Brown et al., 1997). Support has also been found for the discriminant validity and temporal stability of the DASS (Brown et al., 1997).

Self-efficacy was assessed by measuring participants responses to the statement "Based on my academic ability, I expect my grades will be above average" (Himmelstein, 1992). The response was also scored along a 4 point likert scale from "did not apply to me" (0) to "applied to me very much or most of the time" (3). According to self-efficacy theory (Lent, Brown and Larkin, 1984), students scoring high on the scale exhibit high self-efficacy and students scoring low on the scale exhibit low self-efficacy.

Attributional style was measured using the Attributional Style Questionnaire (ASQ) developed by Peterson, Semmel, von Baeyer, Abramson, Metalsky and Seligman (1982). This questionnaire provides scores on the dimensions of internality (internal vs external), stability (stable vs unstable), and pervasiveness (global vs specific) of explanations for good or bad events. It is a self report instrument on which participants give a cause for six good and six bad hypothetical life events and then situate the cause along a 7 point scale for three corresponding questions. These scores are combined to produce a composite

negative (CoNeg) and composite positive score (CoPos), with higher scores on CoNeg indicating a more negative attributional style and higher scores on CoPos indicating a more positive attributional style (range from 3 to 21). A composite overall score of positive and negative scores is obtained by subtracting CoNeg from CoPos, with high scores indicating an overall positive attributional orientation and low scores indicating an overall negative attributional orientation (range from -18 to +18).

Peterson et al. (1982) found the ASQ to have acceptable levels of reliability for CoPos and CoNeg ($\alpha = .75$ and $.72$ respectively). Peterson and Seligman (1984) reported the ASQ has high consistency of scores across tests, and high criterion related validity, and that attributional style has high temporal stability.

The demographic variable of employment was obtained in the questionnaire. The demographic variables of age, gender, and student workload, the academic variable of university entry score, and first semester GPA's were obtained by accessing the Student Information System (SIS), which is a computerised record of student information at the University. Students whose university entry score were not available on the SIS system were contacted by e-mail and asked to forward on their university entry score.

Procedure

The purpose of the study was explained to students in lecture time four to eight weeks prior to the end of semester examinations. The voluntary nature of the study was explained and students who chose to complete the questionnaire provided informed consent to participate in the study. Students then proceeded to fill out the questionnaire, which took approximately twenty-five minutes to complete. Questionnaires were collected immediately after completion. The return rate was over 65% for the Science students but there was a poor response rate for the Information Technology students.

Results

Descriptive Analysis

The means of all the variables used in the analysis are reported in Table 1.

 Insert Table 1 Here

Academic Predictors of Academic Performance

A standard regression was performed between GPA as the dependent variable and university entry score as the independent variable. University entry score was significantly related to GPA. University entry score accounted for 39% of the variance in GPA.

Inspection of the beta values shows a negative relationship between university entry score and GPA, such that as university entry score gets higher academically (closer to one), GPA gets higher (closer to 7). Table 2 summarises the results of the regression analyses in this study.

 Insert Table 2 Here

A standard regression was performed between GPA and self reported study skills. Self reported study skills was not a significant predictor of GPA.

Psychosocial Predictors of Academic Performance

A standard regression was performed between GPA and student institution integration. Student institution integration was significantly related to GPA accounting for 3% of the variance in GPA. Inspection of the beta values shows a negative relationship between student institution integration and GPA. A standard regression was performed between GPA and commitment, GPA and satisfaction, and GPA and career orientation. None of these variables were significant predictors of GPA.

A one way ANOVA was performed between GPA as the dependent variable and level of financial difficulty as the independent variable. There was no significant difference between GPA for levels of financial difficulty, $F(3,171) = 2.46, p > .05$.

The hypothesis concerning social support can not be analysed due to the extreme

skewness of the distribution. The majority of students reported high levels of social support for their university studies.

Three standard regressions were performed between GPA and each of the variables, depression, anxiety and stress. These three variables were not significant predictors of GPA.

Cognitive Appraisal as a Predictor of Academic Performance

A standard regression was performed between GPA and self efficacy. Self efficacy was significantly related to GPA accounting for 8% of the variance in GPA. Inspection of the beta values shows a positive relationship between self efficacy and GPA.

A standard regression was performed between GPA and the ASQ dimension of CPCN and no significant relationship was identified. A standard regression was performed between GPA and the ASQ dimension of CoPos and no significant relationship was detected. A standard regression was performed between GPA and the ASQ dimension of CoNeg. CoNeg was a significant positive predictor of GPA at the .10 level accounting for 2% of the variance in GPA.

Demographic Predictors of Academic Performance

A one way ANOVA was performed between age and GPA. There was no significant difference found across age groups, $F(1,173) = .23$, $p = .63$.

A one way ANOVA was performed between GPA and employment responsibilities. A significant difference in GPA was found for students with different employment responsibilities, $F(2, 172) = 10.73$, $p < .0001$. A post hoc analysis (Tukeys HSD) revealed part time employed students have significantly poorer GPA's than full time employed or unemployed students, with no significant difference between the GPA's of full time employed students and unemployed students. A one way ANOVA was performed between GPA and student workload. No significant difference was found

between the GPA's of part time and full time students, $F(1,173) = .11, p = .74$. As small numbers in some cells prevented a factorial ANOVA from being performed, a chi square analysis was performed between employment and student workload. It appeared that full time employees were often part time students, part time employees were often full time students, and students with no employment responsibilities appeared to be full time students ($p < .0001$). Considered together, full time employees with a part time student workload and full time students with no employment commitments appear to have significantly higher GPA's than full time students who work part time.

A one way ANOVA was performed between GPA and gender. There was no significant difference between males and female's GPA's, $F(1,173) = .17, p = .68$.

Academic, Psychosocial, Cognitive, and Demographic Predictors of Academic Performance

To inspect the data further, an hierarchical regression was performed between GPA as the dependent variable and university entry score entered in the first block, with student institution integration, self efficacy, and employment responsibilities entered in the second block (See Table 3).

 Insert Table 3 Here

Integration and self efficacy were found to contribute significantly to the prediction of GPA over and above that accounted for by university entry score alone. The addition of measures of integration and self efficacy improves the prediction of GPA to 51 %, a 12 % improvement on the prediction of GPA based on OP alone.

Discussion

The main purpose of this study was to undertake a prospective investigation of the relationship between academic, psychosocial, cognitive, and demographic factors and academic achievement in university.

Academic Predictors of Academic Performance

As predicted, university entry scores were a significant predictor of student's GPA's at the end of the first semester of their course of study. Students with high university entry scores were likely to continue this high academic achievement in university. However, university entry scores need to be interpreted with caution, as they explain less than half of the variance in GPA. Unfortunately the prediction of GPA from university entry scores for different age groups could not be examined due to insufficient background information recorded for mature age students.

The hypothesis that study skills were related to GPA was not supported. Self reported study skills were not significantly different for different levels of academic achievement. An explanation for this is that students may hold unrealistic views of their study skills or report a level of study skill deemed acceptable for university. Students with poorer study skills may not be aware of how much of a problem they have with studying at the university level, or may be aware of problems but be unwilling to report such difficulties. Alternatively, students with well-developed study skills may not necessarily see themselves as particularly gifted in their study skills at the university level, or may report a lower, more conservative level of study skill.

Psychosocial Predictors of Academic Performance

As predicted, student institution integration was a significant predictor of academic performance, but interestingly, the relationship was a negative correlation. That is, students who indicated high levels of integration into university tended to have poorer GPA's than students indicating low levels of integration.

The finding that integration has an adverse affect on academic achievement is contrary to Tinto's (1975) model of integration that suggests integration is crucial for positive outcomes at university. While Tinto (1975) recognised that certain social groups

may adversely affect the grades of students who are members of those groups, this caveat was ignored in the development of his model which was generalised to cover all students. However, McInnes, James and McNaught (1995) suggest that integration may have an adverse affect on academic achievement in some student cultures and may be unnecessary for certain students.

There are several explanations for these research findings. Firstly, the distinction between attrition and academic achievement must be noted. Tinto's model was originally developed to explain student attrition, and while researchers have found support for this model in relation to academic achievement, it is possible that differences arise from the distinction between the two concepts. High academic achievement is not necessarily related to retention and poor academic performance does not always result in attrition. Thus, it is possible that while student institution integration has a negative correlation with academic achievement, integration may still be positively correlated with student retention.

Secondly, the differences in findings as reported in this study and previous research based on Tinto's model may have arisen due to cultural differences between Australian and American samples. The majority of the research based on Tinto's model has been undertaken in America. It is arguable that the American student cultural context might be different from the Australian context. While integration into university may be important for the academic performance of American students, it appears that a lack of integration does not adversely affect the academic performance of Australian students, but may even contribute to positive results.

Finally, with changes in technology and university policies, the characteristic well-integrated student identified in previous research may have changed. With the advent of the Internet and e-mail, the social nature of universities may be changing, and studying in isolation may have become adaptive for a sub-group of high achieving students. As

McInnes, James and McNaught (1995) state: “There is a likelihood that student identity, as we know it, is declining. In addition to the influence of flexibility and openness in course structures and delivery, there are broader social forces involved” (p. 88).

The hypothesis that commitment to university would be a significant predictor of academic achievement was not supported. The majority of students indicated a moderate to high level of commitment to university. That is, the majority of students indicated they would reduce outside responsibilities that interfered with university study, they believed attending class was important, and were confident of completing their course of study. It is possible that the slight negative skewness of the sample affected the significance of commitment as a predictor of GPA.

The hypothesis that career orientation would be predictive of GPA was not supported in this sample of first year students. Students with different levels of clarity of career goals did not differ significantly in their attained GPA. The majority of students indicated moderate to high levels of clarity in their career orientation. One of the possible explanations for this result is that career orientation fluctuates and affects GPA differently at different times in the student’s university career. Students start their university year with a perception of what the university course will offer in terms of career choices. With new experiences and changing perceptions of the university course, the reality of possible careers may change. Students may change their career goals in a way which may no longer fit with their course of study, and previous research would suggest that such an incongruence would affect student’s academic performance at this time (Himmelstein, 1992; McInnes, James, and McNaught, 1995).

Psychological health was not a significant predictor of academic achievement. However, as psychological health was measured in the middle of semester, it is possible that depression, anxiety and stress levels were already affected by university factors

(exams and assignments). The non-significant results obtained in measures of psychological health may be due to the time of semester that results were obtained. Szulecka, Springett and dePauw's (1987) research on psychological health was obtained prior to commencement of the university year, which they stated was important so that students were "still strongly influenced by pre-university experiences and to be least contaminated by university-related factors" (p. 83). It might be argued that measuring student's psychological health in the middle of semester may have obtained results that were influenced by these extraneous variables, and may not have identified the student's characteristic level of psychological functioning. Another argument is that, rather than having a direct relationship with GPA, psychological health may influence other predictors of academic performance, such as student institution integration, satisfaction with university and self efficacy.

Cognitive Appraisal as a Predictor of Academic Performance

The hypothesis that self efficacy would be positively related to academic performance was supported. Students reporting high self efficacy of achieving above average grades had significantly higher GPA's than students reporting low self efficacy of achievement. This finding is in line with previous research in the field (Lent, Brown and Larkin, 1984, 1987).

The hypothesis that an optimistic attributional style would be related to higher academic achievement was not supported. Interestingly, the opposite relationship was found, that is, a pessimistic attributional style was predictive of higher GPA's at the .10 probability level.

Demographic Predictors of Academic Performance

The hypothesis concerning the influence of employment responsibilities and student workload was partially supported. Full-time students with no employment

responsibilities appeared to have higher GPA's than full-time students with part-time employment responsibilities. In addition, it was found that part-time students with full-time employment responsibilities had significantly higher GPA's than full-time students with part-time employment responsibilities. The poorest GPA's were identified amongst students with full-time study commitments and part-time employment.

The difference in GPA between full-time students with no employment and with part-time employment can possibly be explained by time restraints. While full-time students with no employment can devote their time to study for university, part-time employment limits the amount of time available to devote to study. The difference in GPA's between full-time students with part-time employment and part-time students with full-time employment is somewhat more complex and obscure. It is possible that part-time students with full-time employment are highly motivated to study and have clear career goals. They may also have well developed time management skills as a product of their full-time employment responsibilities, which might benefit them in their university studies. Full-time students with part-time employment may not have developed these time management skills and career goals, and lacking these skills and goals may adversely affect their academic performance.

Academic, Psychosocial, Cognitive and Demographic Predictors of Academic Performance

Student institution integration and self efficacy were significant predictors of GPA after accounting for the differences in OP scores between students. This model improved the prediction of GPA from OP score by 12%.

We have several recommendations for future research. From a methodological perspective, adequate recording of university entry scores/high school grades of all students is important. Implementing stringent record keeping procedures at the university

level would enable researchers to fully examine the relationship between age, previous academic performance and university achievement.

Attributional style research is a relatively new field and several research possibilities have been highlighted in this study. The attributional style of students across fields of study could be examined to identify the characteristic attributional styles of groups of students. The behaviour invoked by optimistic and pessimistic students in response to negative events may be investigated to gain a better understanding of the complex relationship between attributional style and academic performance. The relationship between self efficacy, attributional style, and academic performance could be examined to identify the influence of a student's self efficacy on their attributions for events, and the corresponding influence on their academic achievement. Such studies may also be extended across cultures to examine the potential 'culture-bound' nature of attributional style.

We suggest several important implications for student support interventions and curriculum change. In general, higher university entry scores and high self efficacy are related to higher academic achievement at university. In terms of university entry scores, universities need to make realistic appraisals of the academic demands of particular courses and set the entry score for school leavers at a level based on academic challenge rather than on course demand. As high university entry scores are moderately correlated with high GPA's, entry to courses with a high level of difficulty should be set at a realistic level to avoid undue problems for both students with lower university entry scores and for the university. Alternatively, specialised enhancement programs need to be introduced and evaluated to provide students with additional skills.

In terms of self efficacy, confidence building programs could be targeted to at-risk students and implemented at the start of first semester. These programs would be aimed at

improving student's self efficacy toward academic achievement and could include an introduction to the style of work expected at university, enhancement of study skills, orientation to different university resources and services, and general confidence raising activities.

Predictors of academic performance influence specific groups at different levels. School leavers, both males and females, are negatively influenced by their degree of integration into the university. There are two suggestions for interventions/curriculum changes to improve school leaver's GPA's. Firstly, individual work and individual assessment should be encouraged for school leavers. Rather than trying to encourage group work based on the assumption that integration will improve academic performance, the benefits of individual study may be promoted. Encouraging individual work may decrease the likelihood that school leavers will be influenced by the possible disinclination toward academic achievement identified in this study.

Alternatively, interventions could be aimed at promoting academic achievement as an important part of integration into the university. University orientation weeks, with their often heavy emphasis on social activities, having fun, and alcohol consumption, may in fact be promoting this disinclination toward academic achievement. It may be necessary to rethink the activities promoted in orientation week and put an increased emphasis on study skills and academic achievement as integral parts of university life. Promotion of study groups (as opposed to social groups) and high academic achievement as socially acceptable and encouraged may help to change this negative view of academic achievement that appears to be promoted in orientation week.

This study has addressed the issue of student achievement by examining prospectively the relationship between academic, psychosocial, cognitive, and demographic variables and the academic performance of first year Australian university

students at an urban commuter-based university. While previous academic performance was the most significant predictor of academic achievement in university, several other factors were identified that influence university grades. Measuring a broad range of academic, psychosocial, cognitive, and demographic variables led to the development of a model which improved the prediction of academic achievement from a prediction based on previous academic performance alone.

Identification of the factors that influence academic performance is important at this point in the history of Australian higher education. With the expanding of Australian universities over the last decade to provide equal access for all, comes an increasing diversity of student's characteristics and needs. To fully embrace this equity initiative, universities must cater for this diverse student population and implement strategies and interventions based on sound research, to give all students a fair chance for academic success.

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Table 1

Descriptives for Data in Study

Variable	Mean	SD
University entry score	5.91	2.69
Study skills	1.59	.76
Integration	1.62	.64
Commitment	2.23	.54
Satisfaction	2.1	.54
Career orientation	1.83	.94
Social support	2.70	.71
Depression	2.86	1.49

Anxiety	2.38	1.32
Stress	3.40	1.39
Self efficacy	1.87	.92
CPCN	2.82	2.56
CoNeg	12.36	1.87
CoPos	15.18	1.83

Table 2

Summary of Regression Analyses

VARIABLE	<u>B</u>	<u>SE B</u>	β
Uni entry score	-.26	.03	-.62****
Study skills	.15	.11	.10
Integration	-.32	.13	-.18**
Commitment	.20	.16	.09
Satisfaction	.29	.16	.14*
Career orientation	-.01	.09	-.01
Depression	.04	.06	.05
Anxiety	.02	.07	.03
Stress	.09	.06	.11

Self efficacy	.34	.09	.28***
CPCN	-.05	.03	-.12
CoNeg	.08	.05	.13*
CoPos	-.02	.05	-.03

**** $p < .0001$. *** $p < .001$. ** $p < .05$. * $p < .10$

Table 3

Psychosocial, Cognitive and Demographic Predictors of GPA Removing OP

VARIABLE	<u>B</u>	<u>SE B</u>	β	R SQUARE
Step 1				
OP	-.26	.03	-.62****	
Total R Square				.39****
Step 2				
Integration	-.55	.14	-.29***	
Self efficacy	.38	.10	.30***	
Employment	-.24	.15	-.11	
R Square Change				.12****
Total R Square				.51****

**** $p < .0001$. *** $p < .001$. ** $p < .05$. * $p < .10$

