

**PSYCHOSOCIAL FACTORS PREDICTING THE ADJUSTMENT AND ACADEMIC
PERFORMANCE OF UNIVERSITY STUDENTS**

by

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Abstract

Although student enrolment at South African universities has significantly increased over recent years; student retention and graduation rates remain low, while student dropout rates are high, especially among historically disadvantaged students. One reason for the low student academic success is poor academic performance which is, in part, influenced by a variety of psychosocial constructs. The present study examined the influence and predictability of the psychosocial constructs of help-seeking, academic motivation, self-esteem, academic overload, perceived-stress, test-anxiety, self-efficacy and perceived social support on students' adjustment and academic performance at university. The current study had four distinctive aims seeking to aid in addressing the current situation: firstly, to identify the relationship between psychosocial constructs, adjustment and academic performance. Secondly, to replicate an earlier model with psychosocial constructs proposing that a partially mediated model is preferred in explaining students' adjustment and academic performance at university- compared to a direct or totally mediated model. Thirdly, to theoretically and empirically extend and test an extended model of psychosocial constructs to explain students' adjustment and academic performance at university. Fourthly, to test for and identify possible group differences among the psychosocial constructs; as well as to establish if students' gender, age and residence status functioned as moderator variables. The present study was conducted at the historically disadvantaged University of Fort Hare. The number of participants was 280 and included first and second-year undergraduate students. Path analysis was conducted to test the hypotheses of the present study. Results partially supported previous findings with regard to relationships between psychosocial constructs, adjustment and academic performance; they also confirmed that a partially mediated model is preferred to explaining students' adjustments and academic performance at university; results showed

that the additional constructs of test-anxiety and self-efficacy increased the explained variance of an extended model to predict students' success at university; and identified some path differences between psychosocial constructs, adjustment and academic performance. It is recommended that universities focus on psychosocial factors as well as students' overall adjustment and well-being as it impacts on their academic performance capabilities. It is further recommended that psychosocial factors are incorporated into existing, or at least considered for, new or enhanced student development, support and intervention initiatives. These university services could be administered and implemented by training existing academic staff along with help from university counselling centres or psychology departments. An integral part of any intervention or support program should be the teaching of coping skills or strategies as well as the incorporation of graduate students to assist and help students adjust to university in order to perform well academically.

Declaration

Student number: 3202-717-6

I declare that PSYCHOSOCIAL FACTORS PREDICTING THE ADJUSTMENT AND ACADEMIC PERFORMANCE OF UNIVERSITY STUDENTS is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

SIGNATURE
(Mr. Marc M. Sommer)

DATE

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Table of Contents

	Page
COVER PAGE	
ABSTRACT.....	i
DECLARATION.....	iii
ACKNOWLEDGEMENTS.....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES.....	ix
LIST OF FIGURES.....	xi
Chapter One: Introduction.....	1
1.1 Higher education in South Africa.....	3
1.2 Addressing past inequalities and challenges in higher education.....	6
1.3 Trends of international and national dropout and graduation rates.....	9
1.4 Equity in academic performance.....	15
1.5 Challenges for historically disadvantaged students at university.....	17
1.6 Intervention and support programs for students at university.....	22
1.7 Problem statement of study.....	25
1.7.1 Background of problem statement.....	25
1.7.2 Problem statement.....	26
1.8 Purpose and aims of study.....	27
1.9 Outline of chapters.....	29
Chapter Two: Literature Review.....	31
2.1 Theories and models of adjustment and academic performance.....	32
2.2 Academic performance.....	44
2.3 Adjustment.....	50
2.4 Psychosocial predictors of adjustment and academic performance.....	59
2.4.1 Help-seeking.....	59
2.4.2 Academic motivation.....	61
2.4.3 Self-esteem.....	64
2.4.4 Perceived stress.....	67
2.4.5 Academic overload.....	70
2.4.6 Test-anxiety.....	74
2.4.7 Self-efficacy.....	76
2.4.8 Perceived social support.....	79
2.5 Consideration of moderator variables.....	84
2.5.1 Gender differences and gender as moderator.....	86
2.5.2 Age differences and age as moderator.....	96
2.5.3 Residence status differences and residence status as moderator.....	99

2.6 Research model and summary of hypotheses based on previous research....	103
2.6.1 Hypothesis 1 – Relationships between independent variables, mediator variable and dependent variable	105
2.6.2 Hypothesis 2 – Model comparison	105
2.6.3 Hypothesis 3 – Model extension.....	106
2.6.4 Hypothesis 4 – Age, gender, and students’ residence status as moderators.....	106
2.7 Research context of the present study.....	108
 Chapter Three: Method	 114
3.1 Procedure	114
3.2 Research measures	115
3.2.1 Demographic measures	115
3.2.2 Independent measures	116
3.2.2.1 Help-seeking	117
3.2.2.2 Academic motivation	117
3.2.2.3 Self-esteem.....	118
3.2.2.4 Perceived stress	119
3.2.2.5 Academic overload.....	119
3.2.2.6 Test anxiety	120
3.2.2.7 Self-efficacy	120
3.2.2.8 Perceived Social Support from friends and family	120
3.2.3 Adjustment as mediator variable.....	121
3.2.4 Academic performance as dependent variable.....	122
3.3 Data analysis procedures.....	123
3.3.1 Reliability analysis.....	123
3.3.2 Descriptive and inferential statistics	124
3.3.2.1 Group comparison.....	124
3.3.3 Pearson’s correlation matrix	124
3.3.4 Path analysis.....	125
3.3.4.1 Model definition in path analysis.....	127
3.3.4.2 Assumptions of path analysis.....	129
3.3.4.3 Sample size considerations	132
3.3.4.4 Model identification.....	133
3.3.4.5 Model fit and Goodness of fit statistics	134
3.3.4.6 Model interpretation.....	135
3.3.4.7 Model comparison (nested models approach)	136
3.3.4.8 Test for moderators	139
 Chapter Four: Results	 141
4.1 Preliminary analysis	141
4.1.1 Participants.....	141
4.1.2 Reliability analysis.....	143
4.1.2.1 Help seeking.....	143
4.1.2.2 Academic motivation	144
4.1.2.3 Self-esteem.....	145
4.1.2.4 Perceived stress	146
4.1.2.5 Academic overload.....	146
4.1.2.6 Test anxiety	147

4.1.2.7 Self-efficacy	147
4.1.2.8 Perceived Social Support from friends and family	148
4.1.2.9 Adjustment	148
4.2 Hypothesis testing	151
4.2.1 Correlation analysis	151
4.2.2 Model comparison	157
4.2.2.1 Fit indices and model comparison	160
4.2.2.2 Interpretation of path coefficients	161
4.2.3 Model extension.....	164
4.2.3.1 Fit indices and model comparison of the extended model.....	166
4.2.3.2 Interpretation of path coefficients for the extended model.....	167
4.2.4 Group comparison and test of moderators	170
4.2.4.1 Group comparison by gender	171
4.2.4.2 Gender as moderator	174
4.2.4.3 Group comparison by age	177
4.2.4.4 Age as moderator	180
4.2.4.5 Group comparison by residence status (students living on or off campus)	182
4.2.4.6 Residence status as moderator	185
Chapter Five: Discussion	191
5.1 Research aims of the present study	191
5.2 Major findings of the present study	193
5.3 Model replication	201
5.3.1 Predictors of adjustment	204
5.3.1.1 Help-seeking predicting adjustment	204
5.3.1.2 Intrinsic motivation predicting adjustment	205
5.3.1.3 Self-esteem predicting adjustment.....	206
5.3.1.4 Perceived stress predicting adjustment	209
5.3.2 Predictors of academic performance.....	211
5.3.2.1 Academic overload predicting academic performance....	211
5.3.2.2 Amotivation predicting academic performance	213
5.3.2.3 Perceived stress directly and indirectly predicting academic performance	214
5.3.3 Adjustment predicts academic performance	217
5.3.4 Statistically non-significant relationship for extrinsic motivation..	223
5.4 Implications for model extension	224
5.4.1 Self-efficacy predicts academic performance	225
5.4.2 Test-anxiety predicts adjustment and academic performance.....	227
5.4.3 Perceived social support from friends and perceived social support from family members do not predict adjustment and academic performance	230
5.5 Implications for group differences and moderation	236
5.5.1 Gender differences and moderation	236
5.5.2 Comparison to Petersen (2006), Davy et al. (2009), Ojeda (2011) and Seipp (1991).....	238
5.5.3 Age differences and moderation	239

5.5.4 Residence status differences and moderation	242
5.6 Contributions of present research	246
5.7 Limitations	248
5.8 Directions and recommendations for future research	252
5.8.1 Considering previous academic performance at high school as an alternative or additional factor	252
5.8.2 Considering additional psychological and psychosocial factors to explain students' adjustment and academic performance at university.....	255
5.8.3 Considering the influence of intrinsic motivation on adjustment and academic performance	255
5.8.4 Considering additional student groups adjustment and academic performance at university	256
5.8.5 Considering additional research at other institutions	256
5.8.6 Considering further research with the proposed extended model	257
5.8.7 Considering further research with the Student Adaption to College Questionnaire	257
5.8.8 Considering alternative or additional measures to assess perceived social support	258
5.9 Conclusion	258
 REFERENCES	 263
 APPENDIXES	
A. Email to students inviting them to participate in the research	340
B. Questionnaire	342
C. Item analysis and t-tests	345

List of Tables

	Page
Table 1. International Graduation Rates	12
Table 2. New First Year Undergraduate Students at UFH, by Year	110
Table 3. New First Year Undergraduate Students at UFH, by Year and Race	111
Table 4. Dropout Rate for Three-Year Programs at the End of First Year of Study (in %) ...	111
Table 5. Dropout Rate for Four-Year Programs at the End of First Year of Study (in %)	112
Table 6. Institutional Undergraduate Graduation Rates for Three and Four-Year Degree Programs, in (n) and (n+2) for 2006 to 2009, (in %).....	113
Table 7. Demographic Characteristics of Participants	142
Table 8. Reliability of Measuring Instrument with Participants from UFH and UCT	151
Table 9. Means, Standard Deviations and Inter Correlations among Principal Variables	155
Table 10. Variance and Path Coefficients for Model 1, 2 and 3.....	162
Table 11. Variance and Path Coefficients for Petersen et al. Model and Extended Model....	169
Table 12. Independent Samples t-test of all Variables between Male and Female Participants.....	174
Table 13. Variance and Path Coefficients for Extended Model for Males and Females.....	175
Table 14. Independent Samples t-test of all Variables between Young and Older Participants.....	179
Table 15. Variance and Path Coefficients for Extended Model for Young and Older Participants.....	181
Table 16. Independent Samples t-test of all Variables between Students Living On and Off Campus.....	184
Table 17. Variance and Path Coefficients for Extended Model for Students Living On	

and Off Campus	186
Table 18. Summary Results of Tested Hypotheses of the Present Study	189
Table 19. Psychosocial Constructs Predictive of Students' Adjustment and Academic Performance with Suggested Intervention for Universities	234
Table 20. Summary of Important Predictor Variables for Historically Disadvantaged Students Adjustment and Academic Performance at University	262

List of Figures

	Page
Figure 1. Petersen et al. (2009) model to predict adjustment and academic performance at university	41
Figure 2. Research design depicting the relationships of the independent variables to the mediator variable and dependent variable	104
Figure 3. Model A	137
Figure 4. Model B	137
Figure 5. Direct and Mediated Model.....	157
Figure 6. Direct Model.....	157
Figure 7. Mediated Model.....	158
Figure 8. Results of the Direct and Mediated Model (Model 1).....	163
Figure 9. The Extended Model with the added paths of self-efficacy, test anxiety and perceived social support.....	167
Figure 10. Results of the Extended Model with the added paths of self-efficacy, test anxiety and perceived social support.....	170
Figure 11. Results of the Extended Model for male and female students	177
Figure 12. Results of the Extended Model for young and old students	182
Figure 13. Results of the Extended Model for students living on and off campus	187

Introduction

For South Africa to improve on competitiveness in the global market, and to advance and grow socio-economically as a country – high-level human capital has to be developed, trained and sustained (Department of Science and Technology, 2012). This applies especially to the areas of science, engineering and technology where South Africa has deficits compared to other emerging economies (e.g., Douglas, 2013; Gabara, 2010; MacGregor, 2012; Philander, 2008; World Economic Forum, 2012-2013). According to the World Economic Forum (2012-2013) South Africa is currently ranked 52nd out of 144 economies. Although performing quite well in some sectors (e.g., financial market development ranked at number three globally); overall, higher education and training is only ranked 84th (with quality of mathematics and science education, quality of the educational system and tertiary education enrolment receiving especially poor ranking at positions 143, 140 and 101, respectively; see World Economic Forum, 2012-2013). Furthermore, the academic ranking of universities by the Centre for World-Class Universities and Institute of Higher Education of the Shanghai Jiao Tong University indicates that South Africa is currently ranked 29th in the world, with only the University of Cape Town being ranked among the top 300 in the world (ARWU, 2012).

To achieve the goal of generating high-level human capital, a number of strategies and initiatives need to be applied and implemented successfully. This may comprise, for example, improving mathematics and science teaching at high school level, increasing enrolment of undergraduate and postgraduate students at university, increasing research output of academic staff and students in peer reviewed journals, increasing the training capacity of supervisors, and ensuring the academic success and graduation of enrolled students (Department of Science and Technology, 2012). By mastering this challenge, South

Africa might be able to transform “from an efficiency-driven economy to a knowledge-based or innovation-driven economy” (Department of Science and Technology, 2012, pp. 12-13).

Recent trends indicate that student enrolment has been increasing steadily at South African universities. For example, student enrolment increased from 473 000 in 1993 to 893 024 in 2010 (International Education Association of South Africa, 2011). However, the academic performance and graduation of especially historically disadvantaged students¹ has been less successful. A high number of students drop out of university and never enter postgraduate studies. For example, in 2009, 316 320 students who received financial aid from the National Student Financial Aid Scheme dropped out of university (International Education Association of South Africa, 2011). The rather poor academic success rates of historically disadvantaged students makes the goal of developing high-level human capital rather problematic and very challenging; especially as “South Africa is not producing enough doctoral graduates necessary for the higher education system and the labour market compared to other countries”, and in addition the present academic employees are ageing (Rhodes In Drive, 2013, p. 7). One reason for student dropout, poor retention and low graduation rates is poor academic performance (e.g., Ishitani & DesJardins, 2002-2003). In order to be academically successful, students have to adjust to the university’s expectations as well as the norms and standards. It is therefore of vital importance to address and identify factors that influence students’ adjustment to and academic performance at university.

¹Throughout this research study the term ‘historically disadvantaged students’ is used to refer to a particular group of students. A historically disadvantaged student is usually defined as coming from a rural environment, having attended a public rural high school and being economically disadvantaged (see e.g., Jones, Coetzee, Bailey, & Wickham, 2008; Scott, Yeld, & Hendry, 2007). Additional characteristics include that English is frequently not their first language and that they are in need of financial assistance to attend university (see e.g., Jones et al., 2008; Scott et al., 2007). Also, historically disadvantaged students are likely to be first-generation students in their respective families – they are the first members of their families to attend a higher educational institution.

Although a multitude of factors influence students at university, the present study focuses on students' adjustment and academic performance from a psychological perspective. Specifically, the present study aims to ascertain how, to what extent and in what way certain psychosocial variables are able to predict students' adjustment and academic performance at university. This information is considered as essential in order to help, assist and support students to better adjust to university and perform better academically. It also serves to inform current and future development, enhancement or refinement of students' support and development programs.

1.1 Higher education in South Africa

The higher educational system in South Africa is characterized by past inequalities due to the still lasting legacy of the apartheid system. Although university access was not restricted to a certain group it was restricted in terms of which educational institution was accessible to a particular group. Universities in South Africa are therefore distinguished as being either historically advantaged universities (e.g., University of the Witwatersrand, University of the Free State, University of Pretoria, University of Cape Town, etc.) or historically disadvantaged universities (e.g., University of Fort Hare, University of Venda, University of the Western Cape, etc.). Historically advantaged universities were not only better funded by the apartheid government, but also had access to far more resources and offered a wider range of degree choices for its students (CHE, 2011). Historically disadvantaged universities, in contrast, were tremendously under-resourced, under-funded and limited in terms of programs offered to students. Before the end of the apartheid system, a university education at a historically advantaged university was generally reserved for the socio-economic middle class in the country and the majority of students were both white and male.

With the advent of the first democratic election in South Africa in 1994, the newly established government started the transformation of the educational system to redress past inequalities. This process was characterized by a fundamental reorganization of the educational institutions (Jansen, 2002) and a redesign of curricula (Ensor, 2002). A substantial part of the reorganization of the educational landscape included the merger of universities and technikons (CHE, 2010), which started in 2002. Previously, higher education in South Africa was comprised of twenty-one universities and fifteen technikons. After the restructuring process, twenty-three institutions remained – including eleven universities, six comprehensive universities (merger between a university and a technikon) and six universities of technology (merger between two former technikons) (CHE, 2011).

Admittance to all universities was widened to provide access for historically disadvantaged students and black student numbers increased from 191 000 in 1993 to 404 000 in 2002 (CHE, 2010). Access and entry to university was no longer based on socio-economic class or purely on high school performance but also had to consider student admission based on the ‘recognition of prior learning’ (Jansen et al., 2007).

The increase of students attending public universities, in particular historically disadvantaged students, also led to the growth of private higher educational institutions in South Africa (Jansen et al., 2007; Kruss, 2002; Mapesela, 2002). The Department of Higher Education and Training registered 319 private Further Education and Training Colleges in 2010 (DHET, 2010). There were two possible reasons for the growth in the private sector. On the one hand, less restrictive admission criteria, the recognition of prior learning and the provision of financial aid offered more students the opportunity to access higher education (Jansen et al., 2007). On the other hand, the increase of students attending public universities was perceived as declining the quality and standard of teaching and learning - and private institutions were seen as a reasonable alternative (Jansen et al., 2007).

A further step in the restructuring process was the reconstitution of the academic workplace (Webster & Mosoetsa, 2001) as well as the implementation of the employment equity act at universities. As described by Jansen et al. (2007), there is now a “growing emphasis on performance, measurement and accountability” (p. 163). Universities are expected to improve the poor student retention and student graduation rates and are measured against targets set by the government.

The retention of university students has been defined differently in the literature. For example, Walleri (1981) defined student retention as “on-time graduation” (p. 3). Crawford (1999) referred to student retention as “maintenance of continued enrolment in classes throughout one semester” (p. 13); whereas Wyman (1997) defined student retention as “the percent of entering students graduating or persisting in their studies at an institution” (p. 29). Similarly, Martinez (2003) described student retention as “the number of learners or students who progress from one part of an educational program to the next” (p. 3). In the present study student retention refers to the number of students that were successfully retained from one year of study to the next year of study and remained at the institution for further studies (i.e., students moving on from the first year of study to the second year).

Graduation rate, in contrast, refers to the number of students that have successfully completed their studies at university. This rate is often separately calculated for the number of students that have successfully completed their studies in the regular time (i.e., 3 years for a 3-year degree program); and for students that need additional years to complete their degree program (i.e., 5 years for a 3-year degree program). Often, the rate for students who complete their studies in the regular amount of time is considerably lower than for students who remain at university for additional years to complete their degree program (e.g., Luckerson, 2013).

Because universities are predominantly funded by the government, there has been a “gradual erosion of institutional autonomy” (Jansen et al., 2007, p.163) coupled with a “growth of accountability” (Jansen et al., 2007, p. 163) to the state. As a result the way in which the university interacts with the state has changed. For example, with the passing of a number of legislations, the state is now in the position to appoint vice-chancellors to universities, merge universities or even close down universities (Jansen et al., 2007). One has to bear in mind though that this is not a unique or isolated incidence affecting only the South African higher education system (Harmon & Meek, 2002). Although one might argue that this is a direct result and consequence of past inequalities and the apartheid system – the reality is that the relationship between universities and the state is changing globally (Webster & Mosoetsa, 2001), together with a growth in private higher education (Knight, 2002).

1.2 Addressing past inequalities and challenges in higher education

The National Plan for Higher Education, initiated by the Department of Education in 2001, started the process of transforming the educational landscape in South Africa. In addition to the changes and processes already described above, one area of particular importance was increasing the participation rates for historically disadvantaged students at universities as well as adjusting the student enrolment distribution in faculties. To address graduate unemployment and high level skills shortages in business and science fields (Moleke, 2005); a student distribution of 40% of all students enrolled in Humanities, 30% in Science and Technology and 30% in Business and Commerce was envisaged (Scott, Yeld, & Hendry, 2007). The government argued that this was a necessary step to redress historical inequalities, to further develop the skills base of the country, to strengthen economic development, to be competitive in global markets, to enhance cultural enrichment and to

promote active citizenship (Buchler, Castle, Osman, & Walters, 2007). In order to increase access to university, financial aid was provided for historically disadvantaged students; and universities implemented academic development and student development programs. Financial aid was also provided to the public high school system to enhance and improve the quality of teaching and learning. The growth in access forced universities to increase their annual student enrolments. Student enrolment was also increased in order to meet the set government target of 23% of the population attending university by 2030 (MacGregor, 2012).

The inadequate number of traditional high school leavers with the necessary entry qualifications for university made this target difficult to reach. According to Yeld, Grobler and Sekwane (2004) there was no improvement in the public high school system and Senior Certificate Examinations (the entry requirement for attending university), up to the year 2004, were regarded as being too easy. To further place this into perspective, the results of the 2006 Senior Certificate Examinations revealed that 66% of high school students dropped out before completing their studies, 11% failed, 16% only received a high school certificate, 2% did not write the examination and only 5% (85 830 students) achieved the requirement to study at university (Scott et al., 2007). As a result, the government advocated increasing the student enrolment of non-traditional school leavers (aged 23 years and above). For example, of the 534 918 undergraduate students and 112 868 post-graduate students enrolled in higher education in 2002, 208 031 students were between the ages of 30 – 49 years, which accounted for 31% non-traditional school leavers attending a university (Buchler et al., 2007).

Over the years student enrolment and registration of historically disadvantaged students at university has continually and steadily increased. This increase in student numbers may have been as a result of policy pressure set out by the Department of Education

(Cloete et al. 2004) and an increasing demand for higher education by school leavers. In general, student enrolment increased from 425 000 students in 1994 to 761 090 students in 2007 (CHE, 2010), 837 779 students in 2009 (CHE, 2011) and up to 892 943 students in 2010 (including 728 429 undergraduate, 138 545 post-graduate and 25 969 occasional students) (CHE, 2012). At the same time black student enrolment increased from 43% in 1998 to 60% in 2000 and 67% in 2007 (CHE, 2004; CHE, 2010). Slightly different figures are reported by Pandor (2005) with black student enrolment increasing from 40% in 1999 to 72% in 2005. According to the Department of Education (2005) and the Ministry of Education (2001) black student enrolment increased substantially over the recent years – from 249 000 students in 1993 to 414 000 in 1999 to over 550 000 in 2004. More recent statistics indicate that black student enrolment had increased to 595 963 by 2010² (CHE, 2012). There is also an indication that the number of traditional high school leavers – those in the age group 18 – 24 – registered at university have increased steadily over the years, from 16.1% in 2005 to 17.0% in 2009 and 17.8% in 2010 (DHET, 2010). Likewise, the enrolment figures for female students have increased steadily over the years – from 42% in 1990, 53% in 2000 (Cloete, Pillay, Badat, & Teboho, 2004) to 57% in 2010 (CHE, 2012). Additionally, the student distribution among faculties has changed; reaching 42.3% in Humanities, 28.6% in Science and Technology and 29.1% in Business and Commerce in 2005, basically achieving the target set by the government (DoE, 2006).

These statistics clearly support and indicate that participation of historically disadvantaged students has increased and that the goal of equity of access has been reached (i.e., Cross, Shalem, & Backhouse, 2009; Mandew, 2003; National Plan for Higher Education, 2001; Ntshoe, 2002; Tait, Van Eeden, & Tait, 2002). There are now more female

² For the year 2010, 178 346 white, 58 219 coloured and 54 537 Indian students were enrolled in university (CHE 2012).

students than male students in higher education, more black than white students at university and more students studying economic sciences and less students are enrolled for subjects in humanities (CHE, 2012; Ensor, 2002; Jansen et al., 2007).

Although these results are impressive and have been achieved in a relatively short time period, the goal of equity in graduation has not been reached and has not been as successful as the goal of equity of access. The goal to achieve equity in graduation refers to students completing their higher education studies, to students performing well academically and to students graduating on time or within a reasonable amount of time thereafter. The effect higher education transformation has had on universities is evidenced by alarming and serious challenges; ranging from high student dropout rates (especially among first year students), low retention and throughput rates of students, low graduation rates of students to a high failure rate among undergraduate students (i.e., Agar, 1990; Department of Education, 2005; Koch & Foxcroft, 2003; Lourens & Smit, 2003; Scott et al., 2007; University World News, 2007a; Zaaiman, van der Vlier, & Thjis, 1998). Dawes, Yeld and Smith (1999, p. 97) described this problem as the "revolving door syndrome", where mostly students from historically disadvantaged groups are entering university, only to drop out after or during the first year of study, because of poor academic performance. The following paragraphs highlight and outline the dropout and graduation rates of students at university both internationally and locally. Information and examples from developed countries are mentioned first, in order to understand and place the high dropout rates and low graduation rates present in South Africa into perspective.

1.3. Trends of international and national dropout and graduation rates

No universally accepted definition of dropout exists. A student who drops out of university is typically defined as a student who leaves the university prematurely without

finishing the degree enrolled for or graduating. That is to say, the student fails to successfully complete his or her academic studies. This does not include students who transfer to another institution or students who change their degree programs. Sometimes, students who do not finish their degree on time are mistakenly considered to be dropouts (i.e., within the traditional three-year period for a three-year BA degree), although they are still at university beyond the typical graduation period. The decision to leave university may also be voluntary and based on the belief, that a university education is unnecessary to attain professional and personal goals in life. In this instance, the decision to leave university may be seen as a positive step the student is taking. However, this is often the exception. Dropping out of university during the first academic year or before the start of the second academic year is frequently directly and/or indirectly related to poor academic performance (Napoli & Wortman, 1998; Sandler, 2000; Scott et al., 2007) and financial difficulties (Duck9.com, 2007; Sandler, 2000; Scott et al., 2007).

Numerous studies indicated that the majority of students drop out of university during or after their first year of study (e.g., ACT, 2003; Barefoot, 2004; Cabrera, Tomas, Álvarez, & Gonzalez, 2006; BBC News, 2008; University World News, 2008). Hence, research has mainly focused on first to second year retention at university, as this is the time when the majority of students are lost from the institutions. For example, the annual survey of the American College Testing organization (ACT) among 2 500 institutions in the United States of America (USA), indicated a dropout rate ranging from 31.8% to 47.2% among undergraduate students (ACT, 2003). Similarly, the graduation rates in the USA for the last twenty years have remained relatively stable, ranging from a high of 54.6% to a low of 50.9% (ACT, 2003). The ACT study further indicated that only 6 out of 10 students will graduate with a BA degree after a time span of six years. Likewise, research by Knapp, Kelly-Reid, Whitmore and Miller (2007) showed that only 35% of undergraduate students

graduate in regular time; and that after six years, only 57% of students have finished their studies.

In the United Kingdom, 25% of students at university did not complete their degree program in 2002 (University World News, 2008). Over the following five years, the UK government invested £ 800m to improve student retention and reduce the dropout rate (i.e., offering financial support for students from low socio-economic backgrounds, offering academic support, additional tutoring and pastoral care, more funding for universities who admitted a large number of students from poor backgrounds). The effect of the investment was, however, minimal as 22% of students continued to drop out of university (Paton, 2008; University World News, 2008). The severity of the current situation becomes even clearer, when the dropout rate is interpreted with actual student numbers. For example, for the academic year 2004/2005, 28 000 full time first year students and 87 000 part time first year students dropped out of university after their first year (BBC News, 2008). For the 2006/2007 academic year 28 785 full time first year students dropped out of university after their first year (The Guardian Datablog, 2009).

The findings from the UK are similar to trends found in Germany, where data provided by the Stifterverband (an association of German science and higher education donors) indicated that almost 30% of first year students drop out of university and do not complete their degree (University World News, 2007b). The dropout rate in Germany translates to up to € 8 billion a year the government is wasting in the higher education sector (University World News, 2007b). According to d'Hombres (2007), who provided an overview of graduation rates for several countries, the graduation rate of students in the UK amounts to 37.5% compared to 19.3% in Germany (see Table 1).

As a further example of international trends, in Australia, according to Heath Gilmore Higher Education (HGHE) (2009), 20% of first year students drop out of university before

the end of the first academic year. As is true for other countries as well; dropout and graduation rates differ among universities within countries. For example, as reported by HGHE (2009), Southern Cross University indicated a dropout rate of 30% compared to the University of Sydney with only 11%.

Table 1

International Graduation Rates

<u>Country</u>	<u>Graduation rates (%), 2000</u>
Finland	40.7
United Kingdom	37.5
Australia	36.3
Poland	34.4
Iceland	33.2
United States of America	33.2
Spain	32.6
Ireland	31.2
Japan	30.9
Sweden	28.1
France	24.6
Germany	19.3
Italy	18.1
Austria	16.0
Czech Republic	13.6

Source: d'Hombres (2007)

Numerous reasons have been cited in the literature as to possible causes for students dropping out of university. For example, in the USA a recent survey among fifteen universities by a student credit card provider with 14 500 participants, indicated that 38% of students dropped out of universities because of financial pressure (Duck9.com, 2007). Other reasons comprised academic disqualification (28%) and poor social fit (13%); followed by lack of family support (9%), health problems (5%), distance from home (4%) and mental or emotional issues (3%) (Duck9.com, 2007).

Research has indicated that the students most likely to drop out of university in South Africa originate from low-income and less educated families from historically disadvantaged groups (Fiske & Ladd, 2004; University World News, 2007a). Although South Africa has a National Student Financial Aid Scheme, only 120 000 out of 735 000 students are supported – and the loans and bursaries available to students often do not cover all expenses. Data shows that 50% of undergraduate students enrolled in higher education institutions in South Africa drop out, with about 30% dropping out in their first year (Department of Education, 2005). Additionally, Macfarlane (2006) reported that nearly 50% of undergraduate students continue to drop out of university, even when taking the movement of students across universities into consideration. A more recent study by the Human Science Research Council (HSRC) found that 40% of students drop out of university in their first year (University World News, 2007a). The HSRC survey of 34 000 students indicated that 14 000 students graduated and that 20 000 students dropped out of university in their first year or halfway through the second year of study. These results clearly indicate that the majority of students lost every year to South African institutions are first-year students. The National Plan for Higher Education (NPHE) further indicated that black students accounted for a larger proportion of dropout and failure rates than white students (Department of Education, 2001).

South Africa's undergraduate graduation rate³ of only 15% for black students for the year 2010 ranks as one of the lowest in the world and has remained relatively unchanged for the time period between 2005 to 2010 (CHE, 2012; Department of Education, 2005). The Student Pathway study by the HSRC also emphasized that only about 15% of students are able to complete their academic studies in the normal or regular time (University World

³In comparison, the undergraduate 2010 graduation rate for Indian, coloured and white students was 13%, 16% and 18% respectively – indicative of similar low rates (CHE, 2012). The highest graduation rate for 2010 was for white and coloured postgraduate students, 37% and 34% respectively (CHE, 2012).

News, 2007a), which translates into students remaining at university for a longer time than desired, resulting in additional financial strain for both the student and the university.

Reasons commonly given to explain the current situation always revolve around financial hardship for students and poor prior academic preparedness by high schools. Although there is no arguing that these factors do affect students some students succeed despite these obstacles, while others do not. Clearly, there may be other factors involved that determine academic success for students.

The dropout of students from university, as well as students taking longer to complete their studies, has certain consequences for the student, university and the state. A university education provides students with a higher overall income, an improvement in living standards, and a degree of recognition for their achievements compared to students with only a high school education. In turn, a student graduating from university will provide the state with higher tax revenues and a return of the investments placed in the students through government loans, bursaries and funds. Similarly, the university is losing tuition fees for subsequent years when a student drops out of university. A student dropout rate of only 20% is costing the South African government R 1.3 billion in subsidies each year (National Plan for Higher Education, 2001). Low graduation of students, as well as high dropout of students not only negatively affects the university budget but also lowers public conviction about the quality and standard of education offered at university (Braxton, Hirschy, & McClendon, 2004; Perry, 2003). In addition, it is likely to generate political pressure to increase the graduation rates and lower overall dropout from university (Charlton, Barrow, & Hornby-Atkinson, 2006). For students to be competitive in the global market place, they have to be well educated, trained and skilled. Consequently, for a country to be successful and develop economically and socially, highly qualified and educated students are a prerequisite.

University graduates are essential in order to address the high level skills shortage in the country (Scott et al., 2007), affecting economic development and growth.

In summary, comparing historically disadvantaged students to white students indicates that the overall graduation rate⁴ for white students is almost 40% higher than that for historically disadvantaged students and that the dropout rate for historically disadvantaged students exceeds that of white students (Balintulo, 2001; CHE, 2012; Cloete et al., 2004; Fiske & Ladd, 2004; Letseka, Breier, & Viseer, 2009; National Plan for Higher Education, 2001; Scott et al. 2007).

1.4 Equity in academic performance

A variety of factors might explain why the goal of equity in graduation has not yet been successful or attained towards a broader student population (i.e., why the dropout rate is so high and the graduation rate so low for historically disadvantaged students). The widening participation for previously disadvantaged groups had provided access for students with lower educational qualifications (e.g., Senior Certificate Examination) and lower levels of academic literacy. McGivney (2001) cautioned early on that this might lead to a decrease in academic performance and that students will find it even more difficult to adjust to university when they are struggling academically. Also, the majority of students entering the historically advanced universities today have a different background, not only educationally but also culturally, to the students who traditionally attended these institutions and therefore they do not fit into the university environment as easily or without difficulty (Jones, Coetzee, Bailey, & Wickham, 2008). As a result two very different sets of cultures clash at the university (Mandew, 2003; Stephen, 2003). An urban university life and culture together

⁴The overall graduation rate for 2010 was 16% for black students and 22% for white students (CHE, 2012).

with high academic demands, expectations and requirements, on the one side, and students with a rural, socio-cultural and educational background, on the other (Jones et al., 2008). Mandew (2003) went one step further by arguing that the majority of historically disadvantaged students entering university perceived their university environment to be hostile and unwelcoming. Naturally, the perception of a hostile and unfriendly or difficult environment makes the academic and social adjustment to university even more difficult than normal and makes it more difficult to perform well academically.

Another point to emphasize is that numerous students were and are under-prepared for the academic demands placed upon them by the university (Du Prè, 2003). Holder, Jones, Robinson and Krass (1999) stated that students often lack the literacy abilities required for academic success. This is often attributed to the poor high school education students received, characterized by insufficient teaching and learning methods to efficiently prepare students for university. There is thus often a gap between what students have learned and the way they have been taught at high school, and the knowledge and learning methods required to perform well academically at university. This may manifest itself in a lack of English language level proficiency or English comprehension (i.e., Naidoo, 2008), inadequate learning methods or in a lack of time management.

In addition to historically disadvantaged students being under-prepared for university, the institutions themselves were also largely under-prepared to accommodate and provide for the high increase in student numbers (i.e., Jones et al., 2008). The high increase in student numbers led to an increase in academic workloads, both on the administrative and the teaching part. This ultimately leads to academic staff being overworked and frustrated and with less time to focus on other areas of interest, especially research activities which are usually regarded as a main component defining academic work (CHE, 2010). Although government funds were distributed to universities to the value of 6 071 million Rand in 2004,

“the proportion of the national education budget allocated to universities fell from 12.57% in 1988 to 8.67% in 2004” (CHE, 2010, p. 4). As a direct result, universities have to accommodate more students with less funding, yet at the same time have to cater for a more diverse student population and are expected to implement and improve new teaching practices and further develop foundation and academic support programs for students.

In summary, the goal of equity in graduation has not been reached. Universities are concerned with how to increase the graduation rate and throughput rate of its students and to lower the overall high dropout rate. In order to achieve this task and be successful universities have to ensure that students adjust well to the university life and climate and at the same time ensure that their academic performance increases. There is thus a necessity to identify additional factors (psychosocial) that determine the adjustment and academic performance of historically disadvantaged students at university beyond the traditional support already provided (i.e., financial aid, academic support programs, academic development programs, improving high school education).

1.5 Challenges for historically disadvantaged students at university

The transition from high school to university can be very difficult for any student (Boyer, 1987; McInnis, James, & Hartley, 2000; Thomas, Bol, & Warkentin, 1991). It is even more challenging for historically disadvantaged students than it is for traditional students (Jones et al., 2008). Jones et al. (2008) indicated that historically disadvantaged students often feel alienated, isolated and lonely in an unfamiliar environment. Although this may also apply to more traditional students, it is of particular concern for historically disadvantaged students. Additionally, historically disadvantaged students often also have to adjust from a rural environment to an urban environment (Miller, Bradburry, & Pedley, 1998; Sennett, Finchilescu, Gibson, & Strauss, 2003). Not knowing anyone, they feel intimidated by

their new physical environment in a strange city (Bojuwoye, 2002). This is also the time when these students come into contact with students from other racial or cultural groups, and they may not be able to communicate with them in their home language (Jones et al., 2008). In addition, the work and study requirements at university are completely different to what students were accustomed to at high school – not only is the volume of work greater and has to be covered in a shorter amount of time, lecturing and tutoring moves along at a far more rapid pace than at high school (CHE, 2010).

As a result the transition from high school to university can be a very stressful time for students with the new demands and challenges with which they are confronted (Baker, 2003, 2004; Bojuwoye, 2002; Sennett et al., 2003; Thomas et al., 1991). Attending university also impacts on students' existing relationships with friends and family members (Astin, 1993; Christie & Dinham, 1991; Terenzini, Rendon, Upcraft, Millar, Allison, Gregg, & Jalomo, 1994). Friends and family members might be left behind when students move away to attend university. With the added demands and pressure of university life keeping in close and constant contact with friends and family members might be challenging which may lead students to redefine their priorities. While some students adjust well to the institutional requirements and demands and to the new environment (i.e., Christie & Dinham, 1991; Tinto, 1987; Upcraft, Gardner, & Barefoot, 2005), a substantial number of students adjust poorly and feel overwhelmed.

Historically disadvantaged students often experience additional challenges that may be unique to them and that do not influence (maybe at least not to such a large extent) more traditional students. The next paragraphs highlight some of these challenges historically disadvantaged students at university might experience, and which may affect or influence their academic performance.

First, the majority of students arriving at university originate from rural areas in the country. As such, students have to adjust not only to the requirements and academic demands of the university; but also to an unfamiliar urban environment and lifestyle to which they may be unaccustomed. This may simultaneously be an exciting and overwhelming experience. As they have more challenges to overcome than more traditional students or students from urban areas, historically disadvantaged students may need more time to become accustomed to their new surroundings and feel comfortable and part of the university community.

Secondly, students often experience a lack of or inadequate financial support during their time at university to cover all their needs (i.e., DHET, 2010; Jansen et al., 2007; Jones et al., 2008; Scott et al., 2007). Although the National Student Financial Aid Scheme (NSFAS) provisioned funds to the value of 1.3 billion Rand to students in 2007, it was not enough to cover the demand (and need) by students (DHET, 2010; Scott et al., 2007). Additionally, students often have no information on how or where to apply for financial aid (CHE, 2010; Jones et al., 2008). Students not only have to overcome the initial registration fees and subsequent tuition fees, but also have to finance their daily living expenses (i.e., transport costs, accommodation costs, meals, extracurricular activities, purchase of textbooks, etc.). As a result students may experience more stress than students who are well covered financially; which may impact on their adjustment to the institution, both academically and socially, and on their academic performance. For example, a student who is unable to afford the costs of extracurricular activities may become socially isolated from fellow students. Students who are fully covered financially may be better integrated to university and well-adjusted academically and socially and hence, perform better academically.

Thirdly, the medium of tuition at university is predominantly English, which is often not the mother tongue of the majority of students and only their second or even third language. In addition, their experience and exposure to written and spoken English may be limited, as there is a lack of or even no access at all to the media (i.e., the internet, computer, television, radio, newspaper). Naturally, understanding the academic literature, thinking at a theoretical level and applying knowledge; as well as reading critically and writing academically is a lot easier for students if they are fluent in the language of tuition (Jones et al., 2008).

Fourthly, many historically disadvantaged students entering university are likely to be first generation students from their respective families. As such they may have no role models to assist or guide them in their new environment and at university (Jones et al., 2008). For example, students coming to university experience a new sense of freedom in their daily lives, but at the same time have to become independent and take responsibility for their decisions.

Lastly, the majority of historically disadvantaged students attended public or rural high schools prior to attending university, which are often described as severely under-resourced and characterized by under-qualified teachers (Nair, Reddy, & Ramaila, 2005; Scott et al., 2007). As such students are often spoon-fed, employ poor study habits and lack literacy skills in reading, writing and mathematics (CHE, 2010; Jones et al., 2008; Scott et al., 2007). This is also true, for example, for first year students at the University of Fort Hare (UFH) where the Placement and Access Test (PAT – used to assess a student's level of numeracy, math and language competency) continuously indicated that the majority of students performed poorly. For example, 74% of all registered first year students for the 2009 academic year at UFH were administered the PAT. Results showed that one third of students scored below the 40% benchmark for the language test and the majority of students scored

below 40% for both numeracy and math tests (PAT Report & Proposal, 2009). Students scoring below the 40% benchmark will find it extremely difficult to succeed at university without intervention or academic support (PAT Statistics, 2009). High schools often provide no or poor career guidance to its students, which may lead to poor course and or degree selection at university (Eduloan, 2008; Jones et al., 2008). Consequently, students leave high school under-prepared (i.e., Yeld, 2003) and ill-equipped for university. Hence, the quality of the high school system which currently ranks at 50 out of 156 developing countries (Eduloan, 2008 – Global Campaign for Education) has to be improved drastically to better prepare students for university entry. The poor academic and social preparation for university by high schools (e.g., Jones et al., 2008) may make it even harder for historically disadvantaged students to adjust to university and to perform well academically.

Although the government has made an effort to improve the standard of schooling, especially in the subjects of mathematics and science (i.e., a scarce skills allowance of 600 million Rand for teachers in mathematics and science subjects; an allocation of 400 million Rand for the development of strategic plans in mathematics, science and technology subjects), the outcome or effect has not yet been very effective (Scott et al., 2007). The latter was indicated by the Trends in International Mathematics and Science Study (TIMSS), where among fifty other participating countries, South Africa came last in both mathematics and science subjects (Scott et al., 2007).

According to the Rural Education Access Programme (REAP) there are additional challenges with which students may be confronted at university. Although there may be other factors which affect students at university, the factors identified by REAP may be important to consider as they were obtained by interviewing rural students attending university. Challenges identified by students included: inadequate academic teaching at university, inadequate learning support, lack of awareness of student support services and a poorly

developed and implemented tracking and monitoring system of at-risk-students (see Jones et al., 2008, pp. 8, 11 and 13).

1.6 Intervention and support programs for students at university

The assessment of students at entry to university, in order to identify their strength and/or weaknesses in certain areas (i.e., English comprehension, numeracy, etc.), is of vital importance and beneficial to both the student and university. Not only may it indicate the likelihood of students performing well academically and graduating; it also informs the academic staff at university if students would benefit from being placed in a foundation program, academic development program or student development program. In short, it would indicate what kind of support the university needs to offer to be most beneficial to the students (to enhance their adjustment to university and to increase their academic performance). In order to reduce the high dropout rate and increase the academic success of students a number of intervention and support programs have been initiated by universities to support and assist historically disadvantaged students. For example, the University of South Africa (UNISA) spent R 50 million to create a network of tutors, teachers and academic support personnel throughout South Africa to support their students (University World News, 2007a). Similarly, the University of Fort Hare implemented the South African Norway Tertiary Education Development Programme (SANTED) – whose main objectives were to increase student throughput and graduation as well as to decrease student dropout. Important to point out here is that the services and programs provided by universities are available to all students equally and not just to historically disadvantaged students. Besides placing emphasis on staff development and tutor training, South African universities also started a student tracking and monitoring system, academic development programs and student development programs (e.g., Archer, 2008; Davidowitz & Rollnick, 2005; Davidowitz & Schreiber, 2008;

Du Rand, 1998; Kagee, Naidoo, & Mahatey, 1997; Miller, Bradburry, & Acutt, 2001; Santed, 2009; Schreiber, 1998; Unisa, 2011; University World News, 2007a).

Academic development programs are concerned with teaching students the appropriate learning and study skills necessary to succeed at university. They focus on academic literacy and language skills and are concerned with narrowing the gap between high school education and the requirements of university. Student development programs concentrate on providing students with life skills (i.e., time-management, stress management, financial management, personal growth, etc.) and in addition providing mentoring, counselling and career guidance to students. As such, both types of programs share the common goal of enhancing academic success of students at university (Miller et al., 2001; Woollacott & Henning, 2004).

Foundational programs (also known as extended degree programs) are part of academic development programs and offer core courses and interventions in addition to the normal curricula of a degree program. They have been funded by the government with 600 million rand between the years 2004-2009 (Scott et al., 2007). An initial evaluation of the different programs suggests that academic development programs (De Boer & van Rensburg, 1997; Miller et al., 2001; Woollacott & Henning, 2004) as well as student development programs (Du Rand, 1998; Schreiber, 1998) have been successful in increasing the adjustment and academic performance of students. In addition, foundational programs are reported to have increased the throughput and graduation rates at individual universities (Scott et al., 2007). Yet, at the same time, the overall dropout rate at institutions remains high and the graduation rate of historically disadvantaged students remains low – which raises the question of how effective the different current interventions and support programs really are or if they have to be refined or extended? According to Jones et al. (2008) student development programs are affected by financial difficulties and constraints. Rightfully, Jones

et al. (2008) argue that “such constraints limit these units in terms of expanding their services or even improving delivery” (p. 74). Additionally, there might be a cultural or social stigma attached to students who participate in student development programs. On the one hand, historically disadvantaged students are not accustomed to seeking out help (Jones et al., 2008); while at the same time they might be perceived by their peers as having serious personal problems. Hence, universities might have to improve on how their services are perceived by their students. Secondly, as indicated by the Rural Education Access Programme study, a tracking and monitoring system to identify students at risk of failing courses in their studies, has been poorly implemented (Jones et al., 2008). A functioning system would be able to identify students at risk early, be able to offer or place them in relevant academic / student support programs, and inform staff at university about their programs’ success or failure.

Scott et al. (2007) argued that the normal completion times for undergraduate degrees “are not realistic or valid for the majority of students” (p. 39) at university anymore and that “inappropriate curriculum structures [...] are an obstacle to improving” (p. 39) the academic performance of students at university. This opinion is also expressed by the South African Survey of Student Engagement (SASSE). The SASSE study, conducted across seven South African universities (including University of Fort Hare) examined the behaviour of 13.636 students on campus and investigated what universities were doing to enhance learning. For example, the survey assessed the campus environment, student staff interactions, learning practices and academic challenges. Results indicated, for example, that 43% of students only study six hours per week – where the recommended time is between 25-30 hours per week; and that 70% of students do not participate in co-curricular activities (Strydom & Mentz, 2010). The researchers advocated offering 4-year undergraduate degree programs instead of the traditional 3-year degree programs and including foundation courses in mathematics,

reading and writing into an “innovative first-year curriculum” (Strydom & Mentz, 2010, p. 25). Additional and intensive training for students that are already struggling academically with their current workload is unlikely to improve their performance (Strydom & Mentz, 2010). Students need more time to complete the additional training and preparation to be successful at university. It is therefore argued that, identifying psychosocial factors that are related to the adjustment and academic performance of particularly historically disadvantaged first-year students might also be useful to improve or enhance current academic and student development programs. It may indicate where changes or additions are of value or significance to students, as well as to the university.

1.7 Problem Statement of study

1.7.1 Background of Problem Statement

Research indicates, that only about half of all undergraduate students entering university in the United States of America (USA) receive an academic degree six years later (National Centre for Education Statistics, 2003); while the graduation of students is even lower for historically underrepresented students (Terenzini, Cabrera, & Bernal, 2001). Boylan, Bonham, Claxton, and Bliss (1992) further indicated that unless academically under-prepared students are provided with institutional support and interventions, only 10% are expected to graduate with the majority of students dropping out of university within the first year (Tinto, 1987). Similarly, as indicated earlier, South African universities are experiencing and struggling with severely high dropout rates and especially low retention and graduation rates. The South African graduation rate⁵ of students stands at only 15 % (Department of Education, 2005; Department of Higher Education & Training, 2013; Mtshali, 2013), with

⁵ The 2011 graduation rate for Master’s and Doctoral students was 20% and 12%, respectively (Department of Higher Education & Training, 2013; Mtshali, 2013).

historically disadvantaged students more likely to drop out of university and less likely to graduate.

Although a variety of measures (foundation programs, student development programs, academic development programs) have been put into place and invested in by universities to help students better succeed and to adjust; their effectiveness or usefulness is at least questionable. This inference becomes apparent by examining the latest available statistics on students' academic success at university. There is thus a necessity to identify specific and additional factors which will help to explain and predict exactly how students adjust to university and what influences their academic performance (beyond the traditional and widely used factors of previous academic performance at high school, financial difficulties, language abilities). This does not imply that the aforementioned factors are not important for students; but other factors might be equally important to contemplate.

1.7.2 Problem Statement

Students at university are expected to perform well academically, to pass all their courses and to graduate – all in a minimum (regular) amount of time. In addition, students are expected to adjust to university life and university culture rapidly and to fit into the academic lifestyle; and to become part of and identify themselves with the institution. Similarly, universities are expected to produce high quality graduates in a timely manner, to have high retention and graduation rates for its students, while at the same time low dropout rates.

Predicting the academic success and adjustment of 'historically disadvantaged first-year students' to university is of utmost importance to improve and enhance the academic performance of students (Levitz & Noel, 1989; Noel, Levitz, & Saluri, 1985; Pascarella & Terenzini, 2005; Upcraft et al., 2005; Petersen, Louw, Dumont, & Malope, 2010). Therefore,

identifying factors that predict students' adjustment to university and academic performance at university is vital.

The identification of additional factors is suggested to lead to the adjustment, refinement or enhancement of current student development and academic support programs. Furthermore, it is advocated that the identification of additional factors will provide universities (for example, student counsellors, academic support staff) with informed knowledge and an advanced understanding of students' immediate and long-term needs in order to be successful at university. It may highlight where students are in need of more assistance and/or guidance and where students might benefit from additional training. Furthermore, increasing the number of successful university students is likely to have a positive impact upon the national development of the country.

1.8 Purpose and aims of study

Previous research, both internationally and locally, has indicated that psychosocial factors play an important role in determining a student's adjustment and academic performance at university. A review of the literature on various databases (e.g., ERIC, SAGE, ProQuest, etc.) on psychosocial factors related to adjustment and academic performance of students at universities indicated that local research efforts, compared to international research, is fairly limited. Locally, the focus has predominantly been on academic performance and not on students' adjustment. Additionally, the use of psychosocial variables to explain or predict students' adjustment or academic performance at university has been equally sparse locally. There is thus a necessity to identify additional factors (psychosocial) that are related to student adjustment and academic performance at university. The focus of the present study is therefore to determine if and to what extent psychosocial factors influence the adjustment and academic performance of students at a local university. It is

assumed that the identification of psychosocial factors will assist and support academic staff in their endeavour to reduce the poor academic performance of first year undergraduate students at universities, and in particular historically disadvantaged first-year students' poor academic performance.

The central purpose of the present study was therefore to test the relationships between psychosocial variables and adjustment and academic performance of students at university. Specifically, the present study addressed four aims. The first aim of the study was to test if the psychosocial variables of help-seeking, academic motivation, self-esteem, perceived stress, academic overload, test-anxiety, self-efficacy, perceived social support from friends and perceived social support from family members are related to students' adjustment at university and to their academic performance. The intention here was to identify which psychosocial variables are positively or negatively associated with adjustment and academic performance. The second aim was to establish if and how the variables of help-seeking, academic motivation, self-esteem, perceived stress and academic overload predict adjustment and academic performance of students at university. Here three different path models (a direct model, a mediated model, and a direct and mediated model) previously tested at the University of Cape Town; (Petersen, Louw, & Dumont, 2009) were replicated (also among historically disadvantaged students) – to establish applicability of earlier findings and to establish if the model(s) is (are) generalisable to students at another institution. The third aim of the study was to extend the model suggested by Petersen et al. (2009) theoretically by including the psychological constructs of test-anxiety, self-efficacy, perceived social support from friends and perceived social support from family members. It was envisioned to conduct model comparison in order to establish whether the extended model better explains students' adjustment and academic performance at university when compared to the model proposed by Petersen, Louw and Dumont (2009).

In principle, the current study thus represents a replication and continuation of previous work conducted with historically disadvantaged students at University of Cape Town (UCT). Since UCT is classified as a historically advantaged university and the University of Fort Hare (UFH) as a historically disadvantaged university; the research study was interested to determine if the identified psychosocial factors related to adjustment and academic performance at a historically advantaged university (UCT) would also be applicable to students at a historically disadvantaged university (UFH). The fourth aim of the study was to test for possible moderator effects among the relationships between psychosocial variables, adjustment and academic performance. Moderator variables encompassed in the present study were: age, gender, and whether students lived on or off campus during the academic year. Testing for possible moderator effects is important as some relationships are only important for a specific group of students and not to others. For example, the relationship between test-anxiety and academic performance might be important for younger students, but not significant among older students.

1.9 Outline of Chapters

Chapter I, the current chapter provided detailed background information about the educational system in South Africa; information about challenges faced by universities and historically disadvantaged students, as well as statistics regarding retention, graduation and dropout rates of undergraduate students at university. It highlighted why there is a need for additional research (especially in South Africa) into the prediction and explanation of students' adjustment and academic performance at university and outlined the aims of the present study.

Chapter II presents an extensive literature review on students' adjustment to and academic performance at university. It highlights dominant theories and models on which the

present research is based. This includes a review of psychosocial factors thought to be related to, and explaining and predicting students' adjustment and academic performance – with an in depth focus on psychosocial factors included in the present study. Lastly, chapter II considers the research context of the present study.

Chapter III concentrates on the research methodology of the present study and outlines the steps followed in conducting this study. This encompasses the research design, sample size consideration, data collection procedure and detailed information about the measurement instruments. Furthermore, Chapter III details the hypotheses to be tested by the present study. In addition, it also outlines the steps and procedure followed to conduct data analysis, and in particular path analysis.

Chapter IV reports the results of the study, outlining both significant and non-significant findings. Here, descriptive and inferential statistics are presented. First, the reliability analysis of the measuring instruments is presented. Then, the results of the hypothesized relationships between psychosocial variables and adjustment and academic performance are reported. Thereafter, the results of model testing using path analysis and the test for moderations are outlined.

Chapter V, the final chapter, provides a comprehensive discussion of the findings. This comprises implementations of the findings as well as recommendations for universities (in particular university staff members) to help students' better adjust to university life and to be more successful academically at university. Furthermore, directions for possible future research are discussed. Thereafter, limitations and strengths of the present study are considered. The chapter concludes with a brief summary of major findings.

Chapter II: Literature Review

Predicting adjustment and academic performance of students at university is an on-going endeavour in higher education. A wealth of information on academic performance and on predicting academic performance exists in the educational, sociological and psychological literature. As a result, numerous factors have been studied and investigated that are related to and predictive of (either directly or indirectly) students' adjustment and academic performance at university. It is beyond the scope of this research to mention or extensively review all previous variables and factors that have been used in academic research. Instead and in order to provide a general overview, the focus of the literature review is concentrated on four main areas, with detailed consideration been given to psychological factors. The first aim of the literature review is to provide a brief overview of the dominant theories and models explaining adjustment and academic performance at university. As the present study is based on the dominant theories of student success, prominence is given to the models from Tinto (1975), Bean (1985) and Cabrera, Nora and Castaneda (1993). The second aim of the literature review is to define and explain the importance of adjustment and academic performance at university and to describe their established relationship. The third aim of the literature review is to focus especially and in detail on the factors that were identified for the present study to predict adjustment and academic performance at university. These factors are based on a review of the adjustment and academic performance literature and were identified to be important for the South African context. Additionally, a summary of previous research conducted in South Africa is provided. Lastly, the fourth aim of the literature review is to present and describe the hypothesized model of the present study explaining adjustment and academic performance at university.

2.1 Theories and models of adjustment and academic performance

According to Cabrera, Castaneda, Nora and Hengstler (1992); Cabrera et al. (1993), Kahn and Nauta (2001); Robbins, Lauver, Le, Davis, Langley, and Carlstrom (2004) and Sandler (1999) the dominant theories of student success at university are the student integration model by Tinto (1975) and the student attrition model by Bean (1985). Both models stress the importance of academic and social integration into the university environment and provide a comprehensive framework to explain student persistence or dropout behaviour (Cabrera et al., 1993; Sandler, 1999). Both models also support the proposition that students' academic performance at university is influenced by their level of adjustment to university and that psychosocial factors influence students' adjustment and academic performance at university.

Tinto (1975) developed a theoretical model to explain and predict students' persistence/dropout behaviour at university. His model, which is partly based on Durkheim's theory of suicide⁶, places importance on how students interact with their environment. The concept of integration is of vital importance to Tinto's model in explaining student dropout/persistence behaviour. According to Tinto (1975), integration at university takes the form of academic and social integration; and both are essential for a student to remain at an institution. For example, a student may perform well academically (academic integration) but at the same time lacks social support and social interaction with peers and lecturers and does not feel part of the institution (lack of social integration). As a result the student may decide to leave, dropout or transfer to another university. Similarly, a student may be well integrated socially (i.e., participating in sport events, has established friendships with fellow students and lecturers), but at the same time performs poorly academically (maybe because of social

⁶The likelihood of suicide is higher among individuals who are not part of or integrated into society (Durkheim, 1961).

activities leaving less time for academic work). Consequently, the student may be forced to leave, dropout or repeat an academic year. Hence, both concepts are important for students' academic success at university, as well as finding the right balance between them.

Tinto (1975) proposed that certain background characteristics; namely family background (e.g., social and or economic status), previous high school education (e.g., type and quality of school attended) and individual attributes (e.g., gender, personality) effect student academic and social integration towards university and that each attribute “has direct and indirect impacts upon performance in college” (p. 94). The academic and social integration of students, in turn, influences their level of goal and institutional commitment towards university. That is, the higher their integration to the university environment, the higher is their level of commitment. Students' commitment towards accomplishing their goals (i.e., successfully completing their studies) and towards university, then, determines if a student is likely to persist or dropout (Tinto, 1975, 1997). Tinto (1987) stated that “eventual persistence requires that individuals make the transition to college and become incorporated into the ongoing social and intellectual life of the college” (p.126).

The student attrition model proposed by Bean (1980, 1982, and 1985) further extended earlier work by Tinto and suggested the importance psychosocial and environmental factors have upon students' socialization at university and dropout or persistence behaviour. Bean (1985) argued that academic factors (e.g., previous academic performance at high school), psychosocial factors (e.g., achievement goals, social life and alienation) and environmental factors (e.g., financial difficulty) influence the socialization process of students at university – which in turn influence the likelihood of persistence or dropout from university. The socialization process itself, according to Bean (1985), consists out of three factors: academic (university grades), social (institutional fit) and personal (institutional commitment). He further indicated that academic factors are likely to influence

academic performance at university and that psychosocial factors are likely to positively influence both institutional fit (a student's subjective perception of belonging) and institutional commitment (students level of attachment to a particular institution). Environmental factors were hypothesized to negatively influence institutional fit, institutional commitment, as well as dropout.

The two models share certain common characteristics to explain student persistence/dropout at university (Cabrera et al., 1992; Cabrera et al., 1993). Both models argue that the persistence/dropout of students at university occurs through the students' interaction over time with their environment (Cabrera et al., 1992; Cabrera et al., 1993). The two models also propose that certain pre-university characteristics will determine the level of academic and social adjustment to university; and that persistence or dropout is influenced by how well students have adjusted to university life (Cabrera et al., 1992). Tinto's concept of institutional commitment is synonymous to Bean's concept of institutional fit (Cabrera et al., 1992; Cabrera et al., 1993).

There are, however, certain differences between the two models. First, Tinto's model included family background variables and individual attributes, whereas Bean's model emphasized the importance of academic, psychosocial and environmental factors influencing student adjustment to university. Secondly, Tinto's model is partly based on Durkheim's theory of suicide, whereas Bean's model is based on theories of socialization. Thirdly, in Tinto's model academic performance is hypothesized to be indicative of student academic integration (i.e. academic performance predicts academic adjustment of students). In Bean's model, academic performance (that is, college grades) is influenced by academic integration and psychosocial factors. Here academic performance acts as a mediating variable between psychosocial factors and dropout or persistence; and as an outcome variable for psychosocial factors (Cabrera et al., 1992; Cabrera et al., 1993).

Although empirical support for the theoretical constructs in Tinto's and Bean's model varied (Cabrera et al., 1992; Cabrera et al., 1993; Kahn & Nauta, 2001) the variable of academic performance has been found to be a consistent and an important predictor variable of student retention and dropout in numerous studies (Bean, 1985; Cabrera et al., 1992; Cabrera et al., 1993; Robbins, Oh, Le, & Button, 2009; Sandler, 2001; Tinto, 1975). For example, Cabrera et al. (1992) empirically compared both models to determine the correctness of the hypothesized theoretical assumptions. Although both models were found to be appropriate in explaining persistence/dropout as a result of interactions between student characteristics and their respective environment and that student adjustment is related to persistence/dropout, Tinto's model was found "to be more robust" (Cabrera et al., 1992, p. 158). Cabrera et al. confirmed 70% of the underlying hypotheses of the student integration model compared to only 40% of the student attrition model. Bean's attrition model, however, explained more of the variance of student persistence at university, a finding which the authors attributed to the inclusion of psychosocial and environmental factors. The analysis further indicated that background characteristics, as well as psychosocial and environmental factors are likely to have an indirect effect on persistence or dropout, "mediated through behavioral intentions to stay or remain at the institution" (Cabrera et al., 1992, p. 159).

Cabrera et al. (1993) synthesized Tinto's and Bean's model to propose the integrated model of student retention. By incorporating important elements and key factors from both theories a more comprehensive and explanative model was proposed (Cabrera et al., 1993). In this model, academic performance and academic adjustment were seen as two separate but related constructs; and academic performance was hypothesized to have a direct effect on persistence/dropout. Cabrera et al. (1993) furthermore demonstrated that environmental factors have a far more significant and greater effect on students' social and academic experience at university than previously assumed.

Adapting previous work by Cabrera et al., Sandler (1999) proposed and tested an extended model of student persistence at university, by including constructs that are important to non-traditional students (non-traditional students were defined as being 24 years of age or above, pursuing undergraduate studies either full-time or part-time). In essence, Sandler (1999) included the constructs of perceived stress, financial difficulty and career decision-making self-efficacy to explain students' persistence. Overall results indicated that the model explained 65% of the variance in students intention to persist at university (Sandler, 1999), considerably more than the 43% explained by the model from Cabrera et al. (1993). It also explained 43% of students' actual persistence, similar to the 47% explained by Cabrera et al. In addition, results indicated that perceived stress is predictive of institutional commitment and financial difficulty; that self-efficacy is predictive of academic adjustment, social adjustment and institutional commitment; and that academic and social adjustment is predictive of students' academic performance at university.

The influence of psychosocial factors on academic performance was extensively studied by Robbins et al. (2004) who provided the first comprehensive quantitative review of the psychological and educational literature. In their meta-analysis of 109 studies, Robbins and colleagues examined the validities of psychosocial and study skills factors and their relationship to academic performance and retention at tertiary level. Their review of dominant educational models of student success and retention at university (Tinto's student integration model and Bean's student attrition model) as well as review of motivational theories in psychology (e.g., Wigfield & Eccles, 2002) resulted in identifying nine psychosocial and study skills constructs related to student academic performance and retention at university. The identified constructs included: achievement motivation, academic goals, institutional commitment, perceived social support, social involvement, academic self-efficacy, general self-concept, academic skills and contextual influences (i.e., financial

support and availability of bursaries, size of tertiary institution, institutional selectivity, see Robbins et al., 2004, p. 264). Achievement motivation relates to factors which motivate students to reach or achieve their goals at university, like graduating on time or receiving good grades. Here, a student might be motivated internally (by their own desire or drive to achieve), externally (by external rewards, for example receiving a student bursary or praise from their parents) or may not be motivated at all. Academic goals were defined by Robbins et al. (2004) as student behaviours related to attaining set goals, in particular the dedication and persistence it takes to graduate from university. Institutional commitment refers to how attached students are to the university and if they identify themselves with the institution. This also includes their level of satisfaction with and adjustment to the university and if their academic and social needs or expectations have been fulfilled. Perceived social support relates to the amount and/or quality of social support students perceive to receive from friends, family members, relatives, fellow students or lecturers during their time at university. Social involvement refers to students' interaction with the university environment and to their social adjustment on campus. For example, the quality and/or levels of social interaction students have with fellow students and/or lecturers on campus. Academic self-efficacy is often defined as how self-confident, independent and self-reliant students are in their abilities and actions at university. The general self-concept relates to student beliefs, attitudes, values and level of self-esteem. Lastly, academic related skills refer to students learning approaches, strategies or skills. This, for example, includes time-management skills, communication skills, problem-solving strategies and the ability to ask for academic help if needed.

Results of Robbins et al. (2004, p. 270) study showed that academic self-efficacy ($\bar{r} = .378$) was the best predictor of academic performance, followed by achievement motivation ($\bar{r} = .257$). Additionally, academic goals ($\bar{r} = .155$), academic related skills ($\bar{r} = .129$) and

social involvement ($\bar{r} = .124$) predicted academic performance. Weaker relationships were found for institutional commitment ($\bar{r} = .108$), perceived social support ($\bar{r} = .096$) and general self-concept ($\bar{r} = .037$). Further analysis revealed that the psychosocial factors of academic self-efficacy, achievement motivation and academic goals alone, accounted for 16.4% of the variance in academic performance; demonstrating the efficacy and substantial contribution psychosocial factors can provide when investigating academic performance at university. Although the explained variance of psychosocial factors was slightly less than the explained variance of 21.9% by the traditional factors of high school marks and assessment test, their contribution remains substantial and important. Psychosocial factors may also be seen as a viable alternative to more traditional factors, not only in explaining academic performance at university, but also in areas of selection procedures (e.g., admission to university, admission to post-graduate studies). The use of high school marks as a predictor of academic performance at university in South Africa has raised doubts on their effectiveness and reliability - and psychological factors may offer a fair alternative, both over the short-term and long-term (Chisholm, 2004; De Villiers, 1999; Fraser & Killen, 2005; Huysamen, 2000; Nunns & Ortlepp, 1994; Petersen et al., 2009; Petersen et al., 2010; Shochet, 1994, Sommer & Dumont, 2011). As demonstrated by Robbins et al. (2004), six of the nine psychosocial constructs (self-efficacy, institutional commitment, academic goals, academic related skills, perceived social support and social involvement) were also related to and predictive of retention. Similar to predicting academic performance, the psychosocial factors explained 13.2% of the variance in university retention. Although the explained variance in the Robbins et al. (2004) study was less compared to academic performance; it explained more of the variance in retention than the traditional constructs of previous school performance, socioeconomic status and standardized tests, which only accounted for 9.1%.

This result demonstrates once more the usefulness and predictive power of psychosocial factors. Hence, Robbins et al.'s (2004) study established the usefulness of psychosocial factors in predicting both academic performance and retention at university. Robbins et al.'s (2004) work may also be seen as a first step towards an integrative and unified framework of psychosocial variables for predicting academic performance as well as retention at university. Besides identifying academic performance as a major indicator of students' academic success at university; Robbins et al. (2004) were also the first to include and advocate the importance of adjustment as a predictor variable (although they referred to adjustment using the terms of institutional commitment and social involvement).

Le, Casillas, Robbins and Langley (2005) further reviewed theories and models on academic performance and retention that were not addressed in Robbins et al.'s (2004) meta-analysis, to identify potential additional predictor variables. Upon their review of the personality and organizational literature in psychology, the five dominant personality constructs (conscientiousness, agreeableness, extraversion, neuroticism and openness) and their predictive powers of two concepts in the organizational literature (job performance and turnover) were identified. Le et al. (2005) argued that job performance and turnover "are analogous to the criteria of academic performance and retention in the educational literature" (p. 485). Research to some extent supports their suggestion of including personality constructs when predicting academic performance. However, results are mixed, with conscientiousness appearing to be the best predictor variable (Poropat, 2009; Trapmann, Hell, Weigand & Schuler, 2007).

In summary, the above review supports and provides evidence for the following assumptions about student success at university:

a) adjustment is an important predictor variable of students' success at university and related to academic performance. Additional empirical evidence for this assumption has been found

by numerous researchers (e.g., Abdullah, Elias, Mahyuddin, & Uli, 2009; Baker, 2003; Baker & Siryk, 1984a, 1984b; Gillock & Reyes, 1999; Petersen et al., 2009; Sennett, Finchilescu, Gibson, & Strauss, 2003; Wintre & Bowers, 2007);

b) psychosocial variables are related to and influence students' adjustment to university (e.g., Baker, 2003; De Raad, 1996; DeVilliers, 1999; Fleming, 1981; Greer & Chwalisz, 2007; Halamandaris & Power, 1997; Heppner & Anderson, 1985; Ramsay, Jones, & Barker, 2007; Robbins et al., 2004; Vallerand & Bissonnette, 1992); and

c) psychosocial variables are related to and influence students' academic performance at university (e.g., Allen & Robbins, 2010; Allen, Robbins, Casillas, & Oh, 2008; Baker, 2003; Clifton, Perry, Roberts, & Peter, 2008; Gerdes & Mallinckrodt, 1994; Lecompte, Kaufman, & Rousseeuw, 1983; Lotkowski, Robbins, & Noeth, 2004; Pokay & Blumenfeld, 1990; Reynolds & Weigand, 2010; Robbins et al., 2004; Robbins et al., 2009; Robbins, Allen, Casillas, Peterson, & Le, 2006; Struthers, Perry, & Menec, 2000; Terenzini & Pascarella, 1978).

In addition, the present study is based on previous work conducted by Petersen et al. (2009), who tested the demonstrated relationships of psychosocial variables and academic performance identified by Robbins et al.'s (2004) meta-analysis in a longitudinal study in the South African context. Petersen et al.'s (2009) study was the first to propose a new psychosocial model to predict and explain student adjustment and academic performance at university (see Figure 1 below) as well as placing importance on the predictive value and influence of a number of psychosocial variables

Their study was carried out with 194 historically disadvantaged students at the University of Cape Town. These students were all on financial aid and regarded as both economically and educationally disadvantaged. The sample size was composed of 85 females and 109 males, with 184 first year students being black. The average age of

participants was 19 years. The following psychosocial variables were included in their study: help-seeking, academic motivation, self-esteem, perceived stress, academic overload and adjustment.

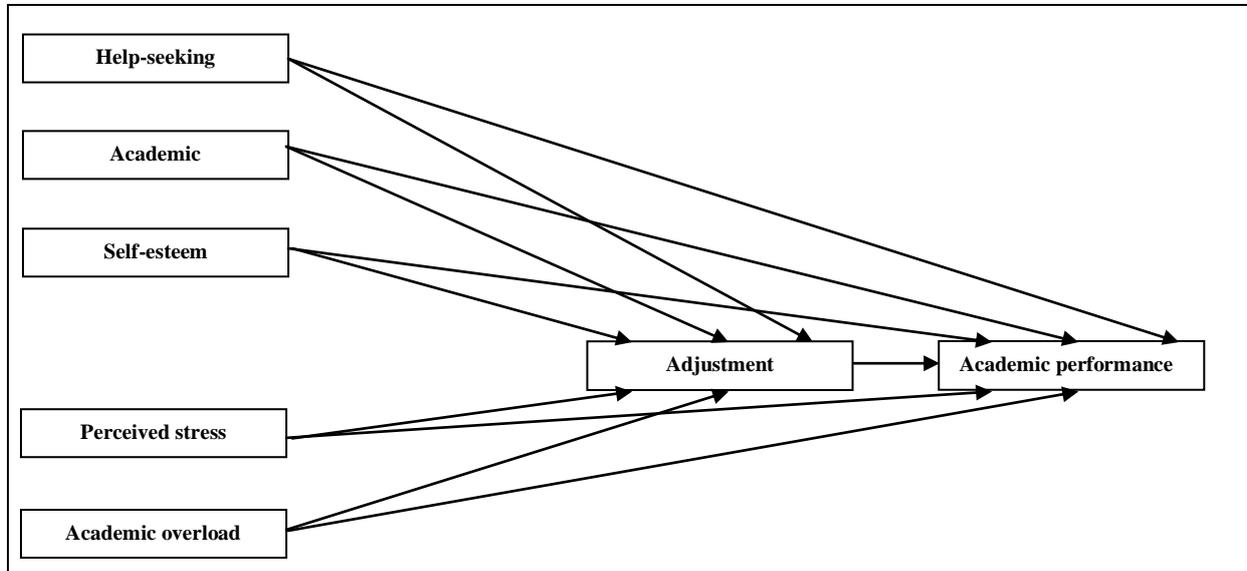


Figure 1. Petersen et al. (2009) model to predict adjustment and academic performance at university

The results of their study revealed significant relationships between the psychosocial variables and adjustment, and between the psychosocial variables and academic performance. Self-esteem was found to be positively related to all four adjustment dimensions as well as academic performance. The variables of academic overload and perceived stress were all significantly negatively related to adjustment, with academic overload also having a negative impact on academic performance. Perceived stress had no significant relationship to academic performance. Academic motivation was divided into intrinsic, extrinsic and amotivation. Intrinsic motivation was also positively related to all four adjustment dimensions, but not to academic performance. Extrinsic motivation and amotivation were both negatively related to all four adjustment dimensions as well as

academic performance. In addition, academic adjustment and personal/emotional adjustment were both significantly positively related to academic performance.

Petersen et al. (2009) conducted three path analyses to determine if adjustment functioned as a mediator variable between the independent psychosocial variables and dependent variable of academic performance; as well as to establish which of their three proposed models explained most of the variance in student adjustment and academic performance at university. Results of their study revealed that their model (see Figure 1) with direct paths from the psychosocial variables to academic performance as well as mediated paths (via adjustment) from the psychosocial variables to academic performance had a good overall fit to the data. The alternative models all displayed an inadequate fit to the data. As a result, the partially mediated model was chosen to explain the results of the study. In summary, motivation, self-esteem, perceived stress and academic overload explained 59% of the variance in student adjustment to university; while adjustment, motivation and academic overload explained 20% of the variance in student academic performance at university. Furthermore, results of their study revealed that the psychosocial variables explained student adjustment to university quite well, while student academic performance at university was less well explained.

There are, however, certain limitations to the Robbins et al. (2004) and Petersen et al. (2009) studies, which are addressed in the present study. First, although Robbins et al. (2004) reviewed the motivational theories in psychology, their study did not consider the research by Pintrich (1989, 2000), Pintrich and De Groot (1990) and Pintrich, Smith, Garcia and McKeachie (1993) predicting academic performance at university. The aforementioned studies, based on both motivational and cognitive constructs, all added the construct of test-anxiety, which is perceived to play an important role in explaining student academic performance at university. As further research has shown, and as indicated by the meta-

analysis by Richardson, Abraham and Bond (2012), test-anxiety has a significantly negative correlation with academic performance and explains a considerable amount of variance in student academic performance. The construct of test-anxiety was also not included in the Petersen et al. (2009) study. Secondly, although Robbins et al. (2004) identified the constructs of self-efficacy and social support, they were not tested and included in Petersen et al.'s (2009) psychosocial model. Thirdly, help-seeking was only assessed by a single question in Petersen et al.'s (2009) study and not by an appropriate scale as the other constructs. Fourthly, Robbins et al. (2004) and Petersen et al. (2009)⁷ did not test for possible moderator effects / difference (e.g., age, gender, etc.) among psychosocial variables and academic performance, which might show significant differences among students at university. Lastly, there is no previous comprehensive model which has tested / addressed all of the psychosocial factors (help-seeking, academic motivation, self-esteem, perceived stress, academic overload, test-anxiety, self-efficacy and perceived social support) together, to account for and determine their influence on student adjustment to and academic performance at university. The psychosocial factors of test-anxiety, self-efficacy and perceived social support have not previously been used in a South African study to assess their relationship to student adjustment and academic performance at university. The outlined limitations above thus substantiate the necessity for additional research.

The next part of the literature review summarizes and details past research studies which have focused especially on students' academic performance at university and on their adjustment to university.

⁷Petersen et al. (2009) did not report a moderator analysis in their published article. The original dissertation by Petersen (2006) did, however, include a moderator analysis for gender.

2.2 Academic performance

The single most important and widely used indicator of student academic achievement or student success at university is their academic performance (Dayioğlu & Türüt-Asik, 2007; Richardson et al., 2012). As such, research on the academic performance of students at university has been conducted using a diversity of sample sizes and sample compositions; including undergraduate (mainly 1st year) and postgraduate students, young and mature age students, minority students, traditional students, and students from different departments and faculties. Previous research has investigated and applied a multitude and variety of different combination of factors when predicting or explaining the academic performance of students at university; containing demographic (e.g., age, gender, race), economic (e.g., financial status, work status), sociological (e.g., socio-economic status, extracurricular activities), academic (e.g., prior academic achievement at high school, learning approaches and learning strategies / skills, time management skills, language proficiency), cognitive (e.g., intelligence, memory ability) and psychological factors (e.g., motivation, personality, self-efficacy, self-esteem, test-anxiety). As a result, previous research has reported relationships and links to numerous factors predictive of student academic performance at university (e.g., McKenzie & Schweitzer, 2001; Petersen et al., 2009; Richardson et al., 2012; Robbins et al., 2004); and it is beyond the scope of the present study to provide a detailed review of all previous factors. The focus is thus on psychosocial factors included in the present study.

Richardson et al.'s (2012) meta-analysis and review of psychological correlates with academic performance provided a current and comprehensive summary of the main psychological variables applied in previous research⁸. In their review of 7 167 studies, 50

⁸ For a complete review and summary of all factors, please refer to Richardson et al. (2012, p. 355, 367).

different factors were identified that all showed a correlation with academic performance, including three demographic factors (age, gender, socio-economic status) and five factors related to cognitive ability, intelligence or prior academic achievement (e.g., matric marks). The remaining 42 factors were classified into five distinct categories: personality traits, motivational factors, self-regulatory learning strategies, student approaches to learning, and psychosocial contextual influences (Richardson et al., 2012). Results of the meta-analysis showed that demographic factors and factors in the psychosocial category had small mean effect sizes on academic performance, whereas prior academic achievement at high school displayed a medium mean effect size.

More specifically, results indicated that the factors of performance self-efficacy ($\bar{r} = .59$), grade goal ($\bar{r} = .35$), effort regulation ($\bar{r} = .32$), academic self-efficacy ($\bar{r} = .31$), strategic approach to learning ($\bar{r} = .23$) and time / study management ($\bar{r} = .22$) had the highest positive mean correlations with academic performance (Richardson et al., 2012, p. 366). The factors of test-anxiety ($\bar{r} = -.24$), procrastination ($\bar{r} = -.22$), surface approach to learning ($\bar{r} = -.18$), general stress ($\bar{r} = -.13$) and academic stress ($\bar{r} = -.12$) recorded the highest negative mean correlations with academic performance (Richardson et al., 2012, p. 366). Their review also incorporated most of the variables used previously by Petersen et al. (2009, 2010), as well as the variable of social support included in the present study. In summary, help-seeking ($\bar{r} = .15$), intrinsic motivation ($\bar{r} = .17$) and self-esteem ($\bar{r} = .09$) indicated small correlations with academic performance; while social support ($\bar{r} = .08$), academic integration ($\bar{r} = .07$), social integration ($\bar{r} = .04$), institutional integration ($\bar{r} = .04$) and extrinsic motivation ($\bar{r} = .01$) displayed very low mean correlations with academic

performance (Richardson et al., 2012, p. 366)⁹. Their review, however, did not include the variables of academic overload and personal/emotional adjustment, both of which were used in the present study.

Nonetheless, prior research indicated that previous academic performance at high school (i.e., matric marks, GPA in North America) tends to be the single most important predictor variable for students' academic performance at university, as it accounts for more variance in academic performance than any other single variable. For example, in the meta-analyses of Trapmann et al. (2007, p. 17), Robbins et al. (2004, p. 270) and Burton and Ramist (2001, p. 6), the mean effect size (Pearson's \bar{r}) of the relationship between prior academic achievement and academic performance at university was .51, .41, and .42, respectively (students who performed well at high school are likely to perform well at university). The reported results from the meta-analyses indicate, however, that prior academic achievement only accounts for or can explain up to 28% of the variance (on average) in academic performance at university, at best. Therefore, other variables must be involved.

Secondly, the usefulness and efficiency of previous academic performance at high school level is debatable and may be more appropriate internationally than under local conditions. Research has shown, for example, that there are "persistent test differences across racial and ethnic groups" (Robbins et al., 2004, p. 262) when examining standardized test scores. Locally, a number of researchers have expressed reasonable doubt on the effectiveness, fairness and reliability of matric marks in determining students' academic success at university (Chisholm, 2004; De Villiers, 1999; Fraser & Killen, 2005; Nunns &

⁹The variables of academic, social and institutional integration in Richardson et al. (2012) meta-analysis may be seen as synonymous to the variables of academic and social adjustment and institutional attachment conceptualized by Baker and Syrik's (1984a, 1989, 1999) Student Adaption to College Questionnaire (SACQ) and used by Petersen et al. (2009, 2010) and in the present study.

Ortlepp, 1994; Shochet, 1994). Their argument is certainly valid, considering that the majority of students entering university today are characterized as coming from historically disadvantaged backgrounds. The majority of students are likely to come from remote and rural areas and have attended a public and government funded high school which lacks resources for adequate training and teaching. Comparing their matric marks to students who attended a private school in an urban setting is unrealistic and should not be used as a deciding factor for university access. Research further indicates that the academic performance of students from historically disadvantaged backgrounds will improve over time and become comparable to students who were not disadvantaged (Huysamen, 2000, 2002) – which is referred to as the late blooming hypothesis.

The late blooming hypothesis theorizes that as students adjust to university life and their new environment, they become accustomed to the demands and expectations of university, participate in academic and student development programs, and improve their level of competency in English language through the interaction with both fellow students and lecturers – therefore their academic performance at university will continually improve (Huysamen, 2000, 2002). Prior academic performance at high school then may be seen as an inaccurate predictor of academic performance at university for the majority of students, as it does not indicate or reflect their true potential or academic performance abilities. To this end, Huysamen (2000, 2002) showed that academic performance of students at university is a better predictor of academic performance for successive years at university than previous academic performance at high school. This further implies the importance of considering alternative factors to predict and explain the academic performance of historically disadvantaged students at university.

The academic performance of students at university not only indicates how well a student is performing academically but also determines the likelihood or possibility of student

retention and successful graduation (Allen & Robbins, 2010; Robbins et al., 2009). Predicting the academic performance of students at university is important, as academic performance has been found to be directly related to and indicative of student retention (Allen et al., 2008; Robbins et al., 2009), to graduating on time (Allen & Robbins, 2010), to degree persistence (Allen & Robbins, 2008), and to university persistence in general (Pascarella & Terenzini, 2005). Students that perform well academically are more likely to move on to the next year of study and to graduate. Moreover, students that perform well academically are also more likely to graduate on time (normal prescribed time to complete a degree or diploma). As the South African Higher Education system is characterized by high dropout and failure rates and low graduation and retention rates (as mentioned earlier) – predicting the academic performance is of vital importance to students and universities alike and has theoretical and practical implications. For example, variables found to be related to adjustment and academic performance will inform the university about specific students' behaviours. On the practical side, these variables could identify areas where students are struggling or need assistance. The university may then decide to target specific areas to offer support or guidance to students to enhance their adjustment and academic performance at university, which in turn, may reduce the drop out and failure rate. Previous academic performance at university also becomes critically important when students apply for postgraduate studies or seek employment – and has often been used to predict the performance of further study at university, the performance of postgraduate study and the selection for postgraduate study (e.g., Kuncel, Hezlett, & Ones, 2001). For example, Kuncel et al. (2001) indicated in their meta-analysis that previous undergraduate performance is correlated with postgraduate performance. Hence, students with good academic marks are more likely to be selected for postgraduate studies and to have better employment opportunities (e.g., Albrecht, Carpenter, & Sivo, 1994).

In order to predict academic performance it has to be measured. In South Africa, student academic performance at university is expressed in terms of percentage points ranging from 0% to 100%, with higher percentages indicating better academic performance. In contrast, other countries use different measures of academic performance. For example, in North America, the usual measure is the Grade Point Average (GPA), which ranges from a low of 1.0 to a high of 4.0. The only limitation in the literature to the use of GPA or percentage points when assessing academic performance relates to the validity and reliability of the academic marks. That is, academic marks might be inflated (Johnson, 2003) and / or universities might assess the same course differently (Didier, Kreiter, Buri, & Solow, 2006). For example, academic marks may be artificially pushed up for all students in a course to reflect better overall performance and success – thereby distorting the actual result. Different universities might assess student performance in similar courses differently – making it difficult to compare the results between institutions.

An important aspect to consider is in which way the academic marks are obtained and what kind of academic mark is used to assess student's performance. Researchers tend to disagree with regard to the method used to measure, interpret and assess academic performance of students at university and also high school. While numerous researchers advocate using actual (official) academic marks when predicting academic performance (Goldman, Flake, & Matheson, 1990); others advocate that the use of self-reported marks is just as viable (Cassady, 2001). While it may be more practical, easier, or sometimes the only opportunity to assess academic performance, self-reported marks can never be more accurate than actual academic marks. For example, student self-reported marks may be under-reported or over-reported, with previous research indicating that students are more likely to over-report their academic marks (Bahrack, Hall, & Berger, 1996; Zimmerman, Caldwell, & Bernat, 2002). Hence, using self-reported academic marks may lead to inaccurate results. To

this end, Kuncel, Crede and Thomas (2005) conducted a meta-analysis to ascertain the accuracy of self-reported academic marks. Surprisingly large mean effect sizes were reported between self-reported and actual academic marks for college students ($\bar{r} = .90$; $n = 12\ 089$, $k = 12$) and high school students ($\bar{r} = .82$; $n = 44\ 176$, $k = 17$) (Kuncel et al., 2005, p. 73). Although no demographic moderators were identified in the analysis, for example, males ($\bar{r} = .79$, $n = 14\ 315$, $k = 7$) reported their academic marks similar to females ($\bar{r} = .82$, $n = 13\ 179$, $k = 5$); results did show that white students ($\bar{r} = .80$, $n = 13\ 831$, $k = 3$) reported their academic marks more accurately than non-white students ($\bar{r} = .66$, $n = 5\ 544$, $k = 8$) (Kuncel et al., 2005, p. 73). The results were, however, moderated by a student's achievement status and cognitive ability. Students with a high cognitive ability and who also perform well academically at university tend to report reasonable accurate academic marks; while self-reported marks from low achieving students tend to be less accurate or unreliable (Kuncel et al., 2005). Hence, results of self-reported marks must be interpreted with caution; especially depending on the kind of sample chosen in the particular research studies.

2.3 Adjustment

The transition from high school to university can be a stressful experience (Anderson, 1994; Dyson & Renk, 2006; Fisher, 1994; Leong, Bonz, & Zachar, 1997; Ramsay et al., 2007) and a challenging time for students (Boyer, 1987). The transition period involves the separation from a previously familiar environment with accustomed daily life routines to a totally new physical, social and personal environment with new rules, demands, expectations and responsibilities. Pascarella and Terenzini (1991) summarized the transition period from high school to university as a "culture shock involving significant social and psychological relearning in the face of encounters with new ideas, new teachers and friends with quite

varied values and beliefs, new freedoms and opportunities, and new academic, personal and social demands” (pp. 58-59). For example, students are likely to be separated from their friends and family members for the first time and have to interact with new individuals to form new social relationships and friendships. Students may also have to adjust from a rural environment to an urban environment; from living at home to living in a university residence; and from the familiar high school and home environments to the unfamiliarity of the university campus. The transition to university also leads students to evaluate their previous expectations and beliefs held about university. Research indicates that the sooner and better students come to terms with reality and adjust their expectations toward university; the more likely they are to commit to studying and to complete their academic work (Ramsay, Barker, & Jones, 1999). But not all students adjust equally well to university or at the same rate. While some students adjust well and relatively quickly, others do not. Backhaus (2009), for example, found that students from low socioeconomic backgrounds are less adjusted academically, personally, emotionally and are less attached to the university. Students who fail to adjust to university are more likely to drop out of the institution (Gerdes & Mallinckrodt, 1994; Tinto, 1996). For example, Baker and Siryk (1986) indicated that the dropout rate may be three times as high among students who are poorly adjusted to university. Similarly, Kantanis (1995) argues that students will face extreme difficulties at university if they do not adjust to the social and academic demands of university life. Poor student adjustment to the demands and requirements of university life may also impact on the psychological and physical health of students (Aspinwall & Taylor, 1992; van Rooijen, 1986).

Over recent years, South African universities have experienced a dramatic increase in student numbers, mostly from historically disadvantaged students. Historically disadvantaged students are faced with additional challenges and problems not faced by other

students (e.g., language, urban environment, etc.). As a result, their adjustment to university is even more difficult and may be one of the reasons why South African universities are faced with high student dropout numbers (e.g., Department of Education, 2005; Macfarlane, 2006; University World News, 2007a). Therefore, students who are maladjusted to university should be identified early (by the university), in order for them to be referred to and placed into academic support programs, student development programs or counselling services. This is especially important, as research has shown that students who are in need of assistance or help at university are unlikely to approach student support services independently (Baker & Nisenbaum, 1979). It is equally important to assess students' adjustment to university, as adjustment can serve as an indicator of whether a student is likely to stay at an institution or likely to drop out. For example, in a study with 952 first year students in 1989 and 1 026 first year students in 1990, Krotseng (1992) indicated that a measure of students' adjustment predicted which students were retained and which were lost from the institution. Overall, the study accurately predicted 79% of the students who continued their studies and 85% of the students who discontinued their studies.

According to Baker and Siryk (1984a) adjustment is multifaceted and not a one dimensional concept. These authors defined students' adjustment to university as a multidimensional dynamic process where students interact with their new environment to establish a fit between their demands, values and expectations and the demands and regulations of university life over time. Anderson (1994) argued that student adjustment to university is an on-going learning experience which is influenced by significant events that students experience. These events can be positive or negative in nature. Arguing that adjustment to university is multidimensional implies that students have to adjust to a number of specific and different requirements simultaneously when entering university.

Academically, students have to adapt to new methods of teaching and are required to read

and prepare for courses independently. Teaching at university moves along at a far more rapid pace than at high school and demands and expects as a prerequisite certain academic competencies in math, language and literature, as well as disciplined independent learning. Students have to develop new learning routines and learning skills (Parker, Summerfeldt, Hogan, & Majeski, 2004). Socially, students have to form and establish new friendships – both with fellow students and lecturers. This may be especially difficult for students who do not have an outgoing or extroverted personality. Students who have difficulty adjusting socially to university may feel isolated or alone; and as a result experience a lack of self-esteem and start to develop negative attitudes towards university. In contrast, students who engage in and who are part of social activities (e.g., study groups, sport activities) may adjust better. Students have to come to terms with the stress and psychological and physical discomfort that may be associated with being in a new and strange environment.

By developing a measure to assess student levels of adjustment to university, the Student Adaption to College Questionnaire (SACQ), Baker and Siryk (1984a, 1989) divided adjustment into four distinct dimensions: academic adjustment, social adjustment, personal and emotional adjustment, and institutional commitment. The current study follows the distinction provided by Baker and Siryk (1984a, 1989, 1999). Empirical evidence for the four distinct dimensions of adjustment has been established by Crede and Niehorster's (2012) meta-analysis.

Academic adjustment refers to academic and educational demands of the university with which students are confronted. This also includes the interaction with lecturers and fellow students about academic tasks (Baker & Siryk, 1999). Previous research has pointed towards a positive relationship between academic adjustment and academic performance, indicating that students who are well adjusted academically achieve higher academic marks (e.g., Baker & Siryk, 1984a; Napoli & Wortman, 1998; Sennett et al., 2003; Wintre & Yaffe,

2000). Academic adjustment has also been found to be related to students career plans (e.g., Chartrand, Camp, & McFadden, 1992; Lopez, 1989), and to students selecting and settling timely on a course of studies and curriculum (e.g., Smith & Baker, 1987).

Social adjustment refers to interpersonal challenges and experiences at university. This contains the interaction with fellow students as well as lecturers on a social level, the forming of new friendships and the level of social involvement in university activities. Research has shown that students who are well adjusted socially are more likely to take part and be involved in social activities at university (e.g., Baker & Siryk, 1984b; Beyers & Goossens, 2002). Terenzini et al. (1994), in a study of 132 students, indicated that social support from friends is positively related to social adjustment at university. They found that having friends from the same high school attending the same university helps students to adjust to university.

Personal and emotional adjustment refers to the psychological and physical distress and discomfort students may experience entering university. Students who are well adjusted on a personal and emotional level have been found to display low levels of stress at university (e.g., Mathis & Lecci, 1999), and are less likely to seek help for personal or academic problems from student support services (i.e., counselling centres, academic support programs) (e.g., Beyers & Goossens, 2002; Johnson, 2001). Pancer, Hunsberger, Pratt and Alisat (2000), for example, found that students with low levels of stress are well adjusted to university.

Institutional attachment refers to the level of attachment associated with the attending university, to how satisfied students are with the university, to how committed students are towards achieving their academic goals (i.e., graduating, receiving good grades), and if students feel a part of the institution. Research indicates that students with high levels of attachment to the institution are more likely to stay and continue their studies and less likely

to drop out (e.g., Baker & Siryk, 1984a; Beyers & Goossens, 2002; Krotseng, 1992; Napoli & Wortman, 1998). Students are also more likely to be satisfied with their university experience and to have a positive attitude towards their university (e.g., Martin, Swartz-Kulstad, & Madson, 1999; Napoli & Wortman, 1998).

Previous research related to students' academic success at university, have examined the role of adjustment to university differently (Robbins et al., 2004). Some researchers have used adjustment to university as an independent variable to predict student academic performance or retention (e.g., Ross & Hammer, 2002; Schnuck & Handal, 2011; Sennett et al., 2003; Strahan, 2003). Other researchers have used adjustment to university as a dependent variable to identify and study possible factors which influence how students adjust to university (e.g., Aspinwall & Taylor, 1992; Schneider & Ward, 2003). In the present study the variable of adjustment fulfils a dual role, acting as independent and dependent variable simultaneously, also referred to as a mediator variable. That is, adjustment acts as a criterion of multiple independent psychosocial variables and as a predictor variable to academic performance. It focuses on adjustment being a predictor variable for students' academic performance at university, but at the same time also concentrates on the influence a number of psychosocial variables might have towards student adjustment to university and towards student academic performance.

Previous research has also indicated that first generation students and international students face difficulties adjusting to university and have been found to be less adjusted to university (Church, 1982; Kaczmarek, Matlock, Merta, Ames, & Ross, 1994; Kagee et al., 1997; Morrison, Merrick, Higgs, & Le Métais, 2005; Ramsay et al., 2007). For example, first generation students (first members of a family to attend university) have more difficulty adjusting to university than second or third generation students (Orozco, 1999, Hertel 2002, Kagee et al., 1997). First generation students may face more difficulties adjusting to

university because of a lack of a role-model (i.e., parents have no prior university experience to pass along and may not be able to prepare or explain what to expect at university); because there is intense pressure and expectations from family members for students to perform well academically; because of the huge financial burden placed on the family for students to attend university; and because first generation students are more likely to be economically and educationally disadvantaged (Hertel, 2002) – which may lead to increased pressure and stress for students. There is, however, also research that has found no differences between the adjustment of first and second generation students (see for instance Bartels, 1995).

Church (1982; as cited in Kaczmarek et al., 1994) indicated that international students' adjustment faces the difficulties of language competence, financial difficulties, homesickness and problems in adjusting to a new educational system and social norms. The problems faced by international students and first generation students are similar if not synonymous to the adjustment problems encountered by historically disadvantaged students within the South African context. Foremost, historically disadvantaged students are mostly likely to be first generation students; are confronted with financial problems (e.g., DHET, 2010; Jansen et al., 2007; Jones et al., 2008; Scott et al., 2007), language problems (e.g., Jones et al., 2008; Naidoo, 2008), a new educational system (e.g., CHE, 2010; Jones et al., 2008), and have to adjust from a rural to an urban environment (e.g., Miller et al., 1998; Sennett et al., 2003). Although international students usually have high academic skills (Kaczmarek et al., 1994), historically disadvantaged students in South Africa usually lack these as a result of poor education and schooling by the high school system (e.g., Du Pre, 2003; Holder et al., 1999; Nair et al., 2005; Scott et al., 2007; Yeld et al., 2004). Kagee et al. (1997) even suggested that insufficient educational preparation by high school may lead to “anxiety and alienation from their lecturers” (p. 249) at university. Similarly, Warren (1997)

advocated that poor prior high school education may result in higher anxiety and lower self-confidence.

Research further showed that adjustment is of vital importance to first year students and that first year students have the most difficulty adjusting to the university (Aspinwall & Taylor, 1992; Baker, 2003; Baker & Siryk, 1986; Halamandaris & Power, 1999; Sennett et al., 2003). There is further evidence that adjustment of first year students is significantly related to and influences their academic performance (Abdullah et al., 2009; Baker & Siryk, 1984a, 1984b; Crede & Niehorster, 2012; Sennett et al., 2003; Wintre & Bowers, 2007). Research has, for example, indicated that first year students experience higher levels of stress than students in subsequent years of study (Jay & D'Augelli, 1991). Another example by Abdullah et al (2009), who studied 250 first year university students, indicated that adjustment significantly predicted students' academic performance, especially academic adjustment and personal and emotional adjustment. Their study showed that students who are well adjusted to university perform better academically; and that academic and personal and emotional adjustment together explained 32% of the variance in students' academic performance. Furthermore, Beyers and Goossens (2002), in a study with 368 first year psychology students in Belgium, reported that social adjustment and institutional attachment had a significant relationship with student dropout, indicating that the lower the level of adjustment and attachment the higher the likelihood of students dropping out of university. Additionally, academic adjustment was found to have a significantly positive relationship to academic performance, although not consistently (the relationship was only significant for first examinations, but not for subsequent examinations) (Beyers & Goossens, 2002). Further empirical evidence for the relationship between adjustment and academic performance (particularly for first year students) comes from the meta-analysis conducted by Crede and Niehorster (2012). In their analysis of 237 studies, medium to small mean effect sizes were

found between academic adjustment and academic performance ($\bar{r} = .39, n = 9\ 000, k = 45$), social adjustment and academic performance ($\bar{r} = .11, n = 8\ 787, k = 44$), personal / emotional adjustment and academic performance ($\bar{r} = .17, n = 7\ 738, k = 38$) and between institutional attachment and academic performance ($\bar{r} = .19, n = 8\ 009, k = 36$) (Crede & Niehorster, 2012, p. 147). Similar results were obtained among first year students' academic performance and adjustment. Academic adjustment ($\bar{r} = .36, n = 5\ 518, k = 27$) was found to be most strongly related to academic performance, followed by personal / emotional adjustment ($\bar{r} = .19, n = 4\ 060, k = 12$), institutional attachment ($\bar{r} = .19, n = 5\ 436, k = 22$) and social adjustment ($\bar{r} = .10, n = 5\ 267, k = 25$) (Crede & Niehorster, 2012, p. 147). Crede and Niehorster (2012) found that “the four college adjustment constructs together increase the proportion of variance in college grades that can be explained by more than 50%” (p. 156).

Lastly, there is evidence in the adjustment literature, that non-white students find it harder to adjust to university, especially at traditional or historically white universities (e.g., Ancis, Sedlacek, & Mohr, 2000; Biasco, Goodwin, & Vitale, 2001; Sennett et al., 2003). For example, Sennett et al. (2003) investigated if there are differences between the levels of adjustment to university among black and white students at the University of Cape Town. In their sample of 339 first year students, including 158 black and 181 white students, significant differences were found for both social adjustment as well as personal and emotional adjustment. White students were found to be better adjusted socially and personally/emotionally than black students, suggesting that black students were less socially integrated and had less social support structures (Sennett et al., 2003). Black and white students displayed no difference in their level of academic adjustment and institutional attachment. Results did, however, indicate that students who expressed thoughts about dropping out of university were less adjusted academically, socially, personally / emotionally

and displayed less institutional attachment (Sennett et al., 2003). This study also supports the indication reported by other studies that there is a significant relationship between adjustment and academic performance, with better adjustment indicating higher academic performance of students at university.

The following parts of the literature review summarize previous research on psychosocial variables included in the present study and their relationships to adjustment and academic performance. This encompassed the variables of help-seeking, academic motivation, self-esteem, perceived stress, academic overload, test-anxiety, self-efficacy and perceived social support from friends and family members.

2.4 Psychosocial predictors of adjustment and academic performance

2.4.1 Help-seeking

According to Ames (1983) “help-seeking is conceptualized as an achievement behaviour involving the search for and employment of a strategy to obtain success. In this context, help-seeking is considered a proactive problem-solving strategy employed by persons who desire to achieve some goal” (p. 165). In order for students to effectively seek help, they first have to identify the problem they need assistance with (Newman, 2002), accept that they need help with a particular problem, and believe that going for help will be beneficial. Numerous students, during their time at university, may require psychological or academic assistance to help them with inter-personal, social, academic or career related problems. As such, knowing where to go for help, knowing what type of help services are available on campus, and to utilize the available help services is of utmost importance to students. This is especially important considering that previous research has found that informal student-faculty interactions, student-faculty contact, and the utilization of available support services and programs on campus are associated with better socialization at

university (Tinto, 1975) as well as having a positive influence on students adjustment and academic performance (Boulter, 2002; DeStefano, Mellott & Petersen, 2001; Grant-Vallone, Reid, Umali, & Pohlert, 2003-2004).

Previous research indicates that students in need of assistance often do not utilize the help that is available on campus (e.g., Constantine, Anderson, Berkel, Caldwell, & Utsey, 2005; Knapp & Karabenick, 1988; Friedlander, 1980; Oliver, Reed, Katz, & Haugh, 1999; Raunic & Xenos, 2008; Russell, Thomson, & Rosenthal, 2008). For example, Oliver et al. (1999) in a study of 248 undergraduate students found that only 30% of students in need of psychological assistance seek for counselling services. Additionally, Raunic and Xenos (2008) in their review of students' utilization rates of counselling services reported that only between 2% to 4% of university students seek help from counselling services on campus. The low rate of students seeking help from counselling services should be of particular concern to universities, as the majority of students seek help for academic and educational problems.

However, despite the importance of student help-seeking behaviour at university, only a small amount of research has investigated the relationship between help-seeking and adjustment and academic performance. The meta-analysis by Richardson et al. (2012), for example, only identified eight independent correlations out of 241 data sets¹⁰ (published between 1997 and 2010) where help-seeking was used to predict students' academic performance at university. Results of their study revealed that help-seeking has a positive mean effect size with academic performance ($\bar{r} = .15, n = 2\ 057, k = 8$) (Richardson et al., 2012, p. 366), suggesting that help-seeking leads to higher academic performance. An example is the study of 240 Belgian university students by Van Overwalle (1989, p. 297),

¹⁰In total, 1 105 independent correlations were analyzed from 241 data sets. Richardson et al. (2012) reviewed 7 167 English language articles.

who reported a significant relationship between help-seeking and academic achievement ($r = .22$). Another example was provided by Karabenick and Knapp (1988). Their study of 612 university students assessed the relationship between perceived academic performance and help-seeking tendencies. They found that students who expected very high marks as well as students who expected very low marks were less likely to ask for help. Instead, students that expected marks “between a B- and a C+” (Karabenick & Knapp, 1988, p. 406) were most likely to seek out help for academic problems.

Based on previous research it is assumed that help-seeking is positively related to academic performance. A positive relationship between help-seeking and adjustment is tentatively hypothesised.

2.4.2 Academic motivation

One theoretical approach that has been widely used to explain the relationship between students’ motivation and their academic performance is Deci and Ryan’s (1985, 1991) self-determination theory. According to their theory, students’ academic behaviour at university is either intrinsically motivated, extrinsically motivated or amotivated. Intrinsic motivation may be defined as “the drive to pursue an activity simply for the pleasure derived from it” (Fairchild, Horst, Finney, & Barron, 2005, p. 332). Reading additional books not prescribed for a particular course out of interest to learn more because a student is enjoying the subject, or attending extra-curriculum lectures because students find them interesting or stimulating are examples of academic intrinsic motivated behaviour. Extrinsic motivation refers to behaviour that is directed outwards. Here the motivation is not internal or for self-determination goals but a means to an end (Vallerand & Bissonnette, 1992) – to achieve an external reward (e.g., praise, acceptance, attending university to attain a high paying job, etc.) or to avoid undesirable events (e.g., disappointing parents or family members, avoiding

criticism, etc.). According to self-determination theory, there are four types of extrinsic motivation: external regulation, introjected regulation, identified regulation and integrated regulation (Ryan & Deci, 2000, pp. 61-62). External regulation refers to behaviour as described under extrinsic motivation. Introjected regulation is defined as “the process whereby an external demand becomes an internal representation which the person uses to approve or disapprove of his or her own actions” (Fortier, Vallerand, & Guay, 1995, p. 259). For example, a student studies for an exam in order to impress their parents or family members. Identified regulation, on the other hand, has been defined as “attributing personal value to a behaviour while still being externally motivated” (Deci & Ryan, 2000, p. 236). Here, a student may not be interested in a particular course and finds the contents irrelevant for his or her field of study, but studies for it in order to pass examinations and to achieve the overall goal of attaining a degree. Integrated regulation “occurs when identified regulations have been fully assimilated to the self [...] through self-examination and bringing new regulations into congruence with one’s other values and needs” (Ryan & Deci, 2000, p. 62). In contrast, amotivated students may be characterized by lacking both intrinsic and extrinsic motivations. Amotivated students do not value the activity or believe they can attain a favourable result (Coakley & White, 1992). That is, amotivation occurs when students believe that their actions are not going to make a difference; in that events or circumstances are caused by factors they cannot control (Cokley, Bernard, Cunningham, & Motoike, 2001). Students with high levels of amotivation may find it hard to explain why they are at university in the first place.

Research indicates that high intrinsic motivation is related to a deeper approach to learning (Ames & Archer, 1988), higher self-esteem (Deci & Ryan, 1995) and lower self-perceived stress (Baker, 2004). Students which are intrinsically motivated are less likely to procrastinate, are confident and in control of their academic tasks, use self-initiated

exploratory strategies and are likely to display autonomy (Pintrich, Smith, Garcia, & McKeachie, 1991; Seifert & O'Keefe, 2001; Senecal, Koestner, & Vallerand, 1995). Intrinsic motivation and the more self-determined type of extrinsic motivation (identified regulation) have also been found to be related to lower dropout and higher retention of students; while amotivation and extrinsic motivation (external regulation and introjected regulation) were either found to have no or a negative relationship to dropout or retention of students (Vallerand & Bissonnette, 1992; Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992).

Previous research indicated that motivation significantly predicts students' adjustment and academic performance at university (Allen & Robbins, 2010; Aspinwall & Taylor, 1992; Baker, 2004; Conti, 2000; Davy, Smith, & Rosenberg, 2009; Deci & Ryan, 1985; Garcia & Pintrich, 1996; Jones et al., 2008; Petersen et al., 2009; Prus, Hatcher, Hope, & Gabriel, 1995; Richardson et al., 2012; Robbins et al., 2004; Robbins et al., 2006; Sikhwari, 2007; Struthers et al., 2000; Vallerand & Bissonnette, 1992). Similar to findings of dropout and retention, intrinsic motivation has mostly been found to be positively associated with adjustment and academic performance; while extrinsic motivation and amotivation are predominantly reported to exhibit a negative or no association with adjustment and academic performance. For example, Allen and Robbins (2010) in their model to predict academic performance and timely degree attainment showed that motivation is predictive of first year students' academic performance. Among 3 072 students studying for a bachelor degree at a four year institution and 788 students studying for a certificate at a two year institution, motivation significantly predicted academic performance ($\beta = .213, p < .01$ and $\beta = .119, p < .05$, respectively) (Allen & Robbins, 2010, pp. 30-31). Furthermore, the meta-analysis by Robbins et al. (2004) as well as the study by Robbins et al. (2006) found a significant positive relationship between motivation and academic performance, even after controlling for prior

academic performance and socio-demographic factors. Similarly, the meta-analysis by Richardson et al. (2012, p. 366), including 22 independent associations for intrinsic motivation and 10 independent correlations for extrinsic motivation, reported a mean effect size for the relationship between intrinsic motivation and academic performance ($\bar{r} = .17, n = 7414, k = 22$) but almost no mean effect size for the relationship between extrinsic motivation and academic performance ($\bar{r} = .01, n = 2\ 339, k = 10$). The final example mentioned here is a study conducted by Baker (2004) which assessed psychological well-being and adjustment to university of 92 second year undergraduate psychology students. The results showed a positive relationship between intrinsic motivation and adjustment ($r = .28, p < .01$), a negative relationship between amotivation and adjustment ($r = -.63, p < .001$), and no relationship between extrinsic motivation and adjustment; indicating that higher intrinsic motivation was associated with better adjustment at university, while higher amotivation was associated with poorer adjustment to university (Baker, 2004, p. 195). There was, however, no relationship between the various motivation variables and academic performance.

In the present study it is assumed that motivation variables may have had indirect effects on academic performance via adjustment, a premise tested by Petersen et al. (2009). Based on previous research findings it is supposed that intrinsic motivation is positively related to adjustment and academic performance. Extrinsic motivations and amotivation are hypothesized to have a negative relationship with adjustment and academic performance.

2.4.3 Self-esteem

Self-esteem is a concept that has been extensively studied in the psychological literature and may be defined as “the individual’s positive or negative attitude toward the self as a totality” (Rosenberg, Schooler, Schoenbach & Rosenberg, 1995, p. 141). Harter (1993) defined self-esteem slightly differently by referring to it as “the level of global regard that

one has for the self as a person” (p. 88). Self-esteem is related to a number of variables that may lead to better adjustment and academic performance of students. For example, happiness (Lyubomirsky, Tkach, & DiMatteo, 2006), life-satisfaction (Baumeister, Campbell, Krueger, & Vohs, 2003; Diener & Diener, 1995), self-efficacy (Lane, Lane, & Kyprianou, 2004; Pajares & Miller, 1994), a deep learning approach (Phan, 2010) and low levels of stress (Abouserie, 1994) have all been found to be related to a student’s level of self-esteem.

Students who have less non-persistence decisions have been reported to display a higher level of self-esteem and to feel more positive about completing academic tasks (Gloria, Kurpius, Hamilton, & Willson, 1999). Numerous studies have demonstrated that there is a positive association between self-esteem and the important educational variables of adjustment (Crede & Niehorster, 2012; DuBois, Bull, Sherman, & Roberts, 1998; Grant-Vallone et al., 2003-2004; Haynes, 1990; Mooney, Sherman, & Lo Presto, 1991; Petersen et al., 2009; Ullman & Tatar, 2001); and academic performance (Baumeister et al., 2003; Lockett & Harrell, 2003; Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005; Marsh & Yeung, 1997; Reitzes & Mutran, 1980; Richardson et al., 2012; Tice & Gailliot, 2006; Valentine, DuBois, & Cooper, 2004; van Overwalle, 1989; Whitesell, Mitchell, Spicer, & Voices of Indian Teens Project Team, 2009; Woo & Frank, 2000; Woodard & Suddick, 1992).

For example, Woo and Frank (2000, p. 223) reported a significant positive relationship between academic self-esteem and academic performance ($r = .41, p < .001$) among 208 first to fourth year American undergraduate students. Similarly, Reitzes and Mutran (1980, p. 29) also indicated an association between self-esteem and self-reported academic performance among 396 second to fourth year undergraduate students, with results of the regression analysis showing that self-esteem has a direct positive effect on students’ academic performance ($\beta = .179, p < .05$). In addition, the result of the meta-analysis carried out by Richardson et al. (2012) reported a small but positive association between self-esteem

and academic performance. In their analysis of 21 independent correlations, self-esteem had a small positive mean effect size predicting academic performance ($\bar{r} = .09$, $n = 4\,795$, $k = 21$, Richardson et al., 2012, p. 366).

Research has also shown that there is a link between self-esteem and adjustment for students at university. That is, researchers have repeatedly found a positive relationship between self-esteem and all four dimensions of adjustment (e.g., Hertel, 2002; Napoli & Wortman, 1988; Wintre & Yaffe, 2000; Yaffe, 1997). For example, in a survey investigating the relationship between self-esteem, family and friend support, academic support programs and adjustment to university, Grant-Vallone et al. (2003-2004) reported that students with high levels of self-esteem and friend support were better adjusted academically and socially at university. Additionally, the meta-analysis by Crede and Niehorster (2012) provides substantial evidence about a link between self-esteem and the different facets of adjustment. Overall adjustment of students to university, as well as all individual facets of adjustment to university showed strong relationships with self-esteem. In their substantial review spanning 1872 to 2010 and comprising multiple databases, overall adjustment and personal/emotional adjustment had the strongest relationship with self-esteem ($\bar{r} = .53$, $n = 7\,345$, $k = 27$ and $\bar{r} = .47$, $n = 3\,783$, $k = 16$, respectively), followed by academic adjustment ($\bar{r} = .43$, $n = 3\,497$, $k = .13$), social adjustment ($\bar{r} = .42$, $n = 3\,607$, $k = 14$) and institutional attachment ($\bar{r} = .39$, $n = 2\,438$, $k = 9$) (Crede & Niehorster, 2012, p. 150). Thus, previous research indicates that there is a stronger association between self-esteem and adjustment than between self-esteem and academic performance. This conclusion might also apply locally, as Petersen et al. (2009) found that self-esteem is predictive of students adjustment to university but not academic performance.

As the majority of studies between self-esteem and academic performance have been correlational in nature there is disagreement about the directionality of the relationship. That is, does high self-esteem lead to better academic performance or does good overall academic performance lead to higher levels of self-esteem? Hence, systematic research is needed to establish if self-esteem predicts academic performance or if academic performance predicts self-esteem. For the present study it is assumed that self-esteem has a positive relationship with adjustment and academic performance and that the relationship is stronger for adjustment.

2.4.4 Perceived stress

According to Putwain (2007), there are two distinct ways to defining the term stress. Stress may either refer to the characteristics, stimuli or factors which are responsible for causing stress; or it may refer to the subjective, personal experience felt by persons, which usually includes feelings of anxiety, worry or guilt. Students at university may experience stress because of intense and demanding academic requirements (e.g., preparing and studying for upcoming exams or assignments, meeting deadlines, managing a high course load by attending lectures and tutorials, adjusting to a new university environment). Academic factors aside, students at university may also experience stress due to financial problems, relationship difficulties or because of pressure and expectations from parents and family members to perform well at university. Previous research indicates that students experience the most amount of academic stress shortly before and during exams time, when they may realize that there is still a lot of academic work left to do in a relatively short amount of time (Abouserie, 1994). Research also showed that students are likely to react differently to different stimuli – that is what may be stressful for one student (e.g., an upcoming final exam) may not be stressful for another (Omura, 2007).

Numerous studies have reported that there is a relationship between the level of stress experienced by students and adjustment to university (Anderson, 1994; Coffman & Gilligan, 2002-2003; Crede & Niehorster, 2012; Dyson & Renk, 2006; Gall, Evans, & Bellerose, 2000; Greer & Chwalisz, 2007; Leong et al., 1997; Malefo, 2000; Mallinckrodt, 1988; Petersen et al., 2009), and between experienced stress and academic performance at university (Akgun & Ciarrochi, 2003; Blumberg & Flaherty, 1985; Chow, 2007; Clark & Rieker, 1986; Felsten & Wilcox, 1992; Hackett, Betz, Casas, & Rocha-Singh, 1992; Linn & Zeppa, 1984; Neville, Heppner, Ji, & Thye, 2004; Pritchard & Wilson, 2003; Richardson et al., 2012; Struthers et al., 2000; Talib & Sansgiry, 2011). The above mentioned studies indicated that students with high levels of stress are less well adjusted to university life and perform less well academically than students with lower levels of stress.

For example, Talib and Sansgiry (2011) in a study with 199 undergraduate and graduate students reported a significant negative relationship between stress and academic performance ($r = -.392, p < .001$), indicating that higher stress leads to poorer performance. Struthers et al. (2000) in a model testing the effects of stress, motivation and coping style to predict the academic performance of college students found that higher levels of stress were associated with lower course grades. Among 203 psychology students, stress directly and inversely predicted their course grades ($\beta = -.40, p < .05$) (Struthers et al., 2000, p. 587). Similar findings were obtained by Neville et al. (2004) and Chow (2007). Neville et al. (2004, p. 611) found in their study of 260 black first to fourth year undergraduate students attending a predominantly white university, that academic stress predicted negatively students' academic performance ($\beta = -.334, p < .01$). Of particular interest was the finding that academic stress explained more of the variance in first year students' academic performance than traditional university entry examinations. Chow (2007), on the other hand, examined twelve different variables, among them stress, to predict the academic performance

of Canadian university students. Results indicated that in a sample comprising 373 undergraduate students, financial stress ($\beta = -.101, p < .05$) and stress due to academic, social and work requirements ($\beta = -.108, p < .05$) were both negatively related to and predictive of students' academic performance (Chow, 2007, p. 486). Lastly, the study by Hackett et al. (1992) examined the relationship between educational and psychosocial factors and academic performance, and included a measure of perceived stress. Stress was found to be negatively related to first and second year students' semester results as well as final results (both $r = -.14, p < .05$) (Hackett et al., 1992, p. 534). Additionally, strain – defined by the authors as stress interfering with students' academic performance, was negatively related to students' semester and year end results (both $r = -.28, p < .001$); as well as a significant predictor for both semester and final results¹¹ ($\beta = -.21$ and $\beta = -.12$ respectively) (Hackett et al., 1992, pp. 534-535). Previous research further indicates that stress has a negative relationship with all four adjustment dimensions and that the relationship is highest for personal/emotional adjustment (Hunsberger, Pancer, Pratt, & Alisat, 1996; Wintre & Yaffe, 2000; Yaffe, 1997).

To conclude, the meta-analysis by Richardson et al. (2012) on factors related to academic performance and the meta-analysis by Crede and Niehorster (2012) on factors related to adjustment provided further evidence that stress is inversely related to students' performance and adjustment at university. Richardson et al. (2012, p. 366) reported that among eight independent associations, stress had a negative small mean effect size with academic performance ($\bar{r} = -.13, n = 1\,736, k = 8$); with similar results obtained among four independent correlations examining academic stress and academic performance ($\bar{r} = -.12, n = 941, k = 4$). Findings from Crede and Niehorster (2012, p. 150) revealed that overall adjustment to university had the strongest negative relationship with stress ($\bar{r} = -.37, n = 2$

¹¹*p* values were not reported by Hackett et al. (1992).

563, $k = 15$), followed by personal/emotional adjustment ($\bar{r} = -.29$, $n = 2\,615$, $k = 15$), academic adjustment ($\bar{r} = -.28$, $n = 2\,522$, $k = 15$), social adjustment ($\bar{r} = -.19$, $n = 2\,522$, $k = 15$) and institutional attachment ($\bar{r} = -.12$, $n = 1\,249$, $k = 7$). Previous research suggests that stress may have a stronger negative association with adjustment than with academic performance (i.e., Crede & Niehorster, 2012; Richardson et al., 2012). This trend was also found in the local study conducted by Petersen et al. (2009) where stress was found to be negatively related to and directly predictive of students adjustment to university but not to their academic performance. Based on the literature review perceived stress is expected to have negative associations with both adjustment and academic performance.

2.4.5 Academic overload

Academic overload refers to students' feelings of being overwhelmed by their academic requirements or responsibilities while pursuing a degree at university. Academically overloaded students might feel that there is insufficient time to effectively and adequately manage all academic tasks (e.g. tests, exams, research assignments, essays, oral presentations). For example, in a survey conducted with 261 217 first year college students at 462 two and four year institutions, it was found that 30% of the students felt overwhelmed by their academic requirements (Reisberg, 2000). Students may cope with and/or avoid academic overload at university by learning how to effectively manage their curriculum, by learning and applying time management skills, as well as learning effective study techniques. Some researchers argue that particularly part-time students are likely to feel overloaded and stressed (Watts & Pickering, 2000).

Despite the influence academic overload might have on students' adjustment and academic performance at university, only a few studies actually tested the relationship (Bean & Hammer, 2006; Bitzer & Troskie-De Bruin, 2004; Chambel & Curren, 2005; Macan,

Shahani, Dipboye, & Phillips, 1990; Petersen et al., 2009), with the majority of these studies indicating that academic overload has a negative influence on student adjustment and academic performance (i.e., higher academic overload leads to poorer adjustment and academic performance at university). For example, Bean and Hammer (2006) studied the relationship between students' stress and academic workload with 130 first to third year pharmacy students and found that 55% of the students were overloaded – in that they had to completely ignore one course in order to effectively prepare for a second course. Chambel and Curren's (2005) study evaluated the relationship between students' academic workload, peer support, satisfaction with university and academic performance. In their study of 825 Portuguese students, it was found that experiencing difficulties with the academic workload at university has negative influences on their adjustment and academic performance. In a local study conducted by Bitzer and Troskie-De Bruin (2004) with 1 868 first year students at the University of Stellenbosch, factors related to improving the learning experiences of students were assessed. A major finding of the study was that first year students tend to underestimate the time required for independent study and course preparation (Bitzer & Troskie-De Bruin, 2004). This may lead to academic overload, which in turn leads to poor adjustment and academic performance. The only other identified local study which focused on students' academic overload to predict their adjustment and academic performance at university was the one conducted by Petersen et al. (2009). They found that among a sample of 194 students at the University of Cape Town, academic overload negatively predicted students' adjustment to university ($\beta = -.111, p < .05$) as well as their academic performance ($\beta = -.212, p < .01$) (Petersen et al., 2009, p. 110). As only a few studies have assessed academic overload and its relationship to adjustment and academic performance at university, more research is required to confirm earlier findings. For the present study, academic

overload is hypothesized to have negative associations with adjustment and academic performance.

The first aim of the present study was to replicate Petersen et al. (2009) study by applying their model to university students but in a different (although more common for South Africa) context. As such, this study was interested to test, if and to what extent results may be similar or comparable to the findings reported by Petersen et al. (2009). This study used the same variables as proposed by Petersen et al. (2009), the same measurement instruments, as well as the same strategy to analyse the data. However, as help-seeking was not related to either adjustment or academic performance in Petersen et al.'s (2009) study (attributed by the authors as a methodological issue) it was assessed differently in the present study. There were three additional reasons to conduct a replication study of the Petersen et al. (2009) model. First and according to Kline (2005), it is vital to replicate path models with different samples to establish their meaningfulness – a task which is rarely done in academic research. Secondly, Petersen et al. (2009) could not demonstrate the multidimensionality of adjustment in their model – a result which was in contrast to the majority of previous research findings. The present study therefore aimed to establish if this also applies to another sample of South African students. Thirdly, the present study aimed to replicate the findings of Petersen et al. (2009) which suggest that their model rather explains students' adjustment to university than their academic performance.

As outlined above, the Peterson et al. (2009) model has certain limitations. The second aim of the study was therefore to extend the original model proposed by Petersen et al. (2009). This was necessary because of two primary reasons. First, the Petersen et al. (2009) model explained students' adjustment to university quite well, but their academic performance less well. Secondly, the factors of stress, self-esteem and help-seeking were not found to be predictive of students' academic performance at university in Petersen et al.'s

(2009) study. Accordingly it was decided to extend the proposed model by Petersen et al. (2009) with three additional constructs inherent or related to the main theories of student retention from Tinto (1975) and Bean (1985), as well as to the psychological model of college student retention from Bean and Eaton (e.g., see Bean & Eaton, 2001-2002). This included the constructs of test-anxiety, self-efficacy and perceived social support. For Tinto and Bean, academic and social integration (adjustment) into the university and how students interact with their environment are central to explaining retention and persistence (i.e., academic success). It is reasoned that a student's level of test-anxiety and self-efficacy plays a role in their academic integration to university; whereas the amount of perceived social support students receive from family and friends may play a role in determining how students integrate on a social level to the institution. Additionally, Bean (1985) theorizes, that psychosocial factors (e.g. alienation and social life) influence academic performance and integration at university. The amount of perceived social support a student receives from both their family and friends relates to and taps into Bean's constructs of alienation and social life. Furthermore, Bean and Eaton's psychological model of college student retention is partly based on self-efficacy theory and suggests that self-efficacy influences a student's academic and social integration to university, with a positive level of self-efficacy leading to successful integration and academic performance. As such, the construct of self-efficacy was hypothesized to be a vital addition to the extended model.

The next part of the literature review summarizes the main research findings for the constructs of test-anxiety, self-efficacy, perceived social support from friends and perceived social support from family members and their relationship to adjustment and academic performance at university.

2.4.6 Test-anxiety

Test anxiety, as defined by Suinn (1968), refers to the “[...] inability to think or remember, a feeling of tension, and difficulty in reading and comprehending simple sentences or directions on an examination” (p. 385). Similarly, Zeidner (1998) defined test-anxiety as a “[...] set of phenomenological, physiological, and behavioural responses that accompany concern about possible negative consequences or failure on an exam or similar evaluative situation” (p. 17). Students who experience test-anxiety during an examination have been reported to feel tense and to worry about a possible negative outcome (Gierl & Rogers, 1996). Feeling slightly nervous and tense, and experiencing low to moderate levels of stress about an upcoming examination is considered to be normal. Elevated levels of test-anxiety, however, may have adverse consequences for students’ academic success at university.

Previous research shows decisive evidence for a strong inverse association between student test-anxiety and academic performance, consistently finding that high test-anxiety leads to lower academic performance (e.g., Cassady & Johnson, 2002; Chapell, Blanding, Silverstein, Takahashi, Newman, Gubi, & McCann, 2005; Everson, Millsap, & Rodriguez, 1991; Faleye, 2010; Garcia & Pintrich, 1996; Gaudry & Spielberger, 1971; Hancock, 2001; Hembree, 1988; Jing, 2007; Justice & Dornan, 2001; Putwain, 2007; Rana & Mahmood, 2010; Rezazadeh & Tavakoli, 2009; Seipp, 1991; Smith, Arnkoff, & Wright, 1990; Talib & Sansgiry, 2011). For example, the studies of Chapell et al. (2005), Cassady and Johnson (2002) and Faleye (2010) showed that students with low levels of test-anxiety displayed higher levels of academic performance than students with moderate or high levels of test anxiety; and students with moderate levels of test-anxiety displayed higher levels of academic performance than students with high levels of test-anxiety. Additionally, three meta-analyses reporting on the relationship between test-anxiety and academic performance were identified; all showing a significant negative relationship between test-anxiety and academic

performance. The meta-analysis by Hembree (1988) reviewed 562 studies conducted from 1950 to 1986. In total, 32 studies were identified that examined university students, classified according to how test-anxiety and academic performance were assessed. The relationship between test-anxiety and academic performance was therefore assessed three times, once for course grades and test-anxiety (14 studies), once for GPA and test-anxiety using the Test Anxiety Questionnaire (9 studies), and once for GPA and test-anxiety using the Anxiety Achievement Test (also 9 studies). Results showed a negative mean effect size between course grades and test-anxiety ($\bar{r} = -.15$, $n = 1\ 644$, $k = 14$), between GPA and the Test Anxiety Questionnaire ($\bar{r} = -.12$, $n = 1\ 499$, $k = 9$), and between GPA and the Anxiety Achievement Test ($\bar{r} = -.29$, $n = 1\ 423$, $k = 9$) (Hembree, 1988, p. 55). Similarly, the meta-analysis by Seipp (1991, p. 35) also displayed a negative mean effect size ($\bar{r} = -.233$, $n = 28\ 424$, $k = 114$) between test-anxiety and academic performance. The more recent meta-analysis by Richardson et al. (2012) confirmed these earlier results. In their assessment of 29 independent correlations, amounting to a total sample size of 13 497 students, the relationship between test-anxiety and academic performance had a negative mean effect size ($\bar{r} = -.24$) (Richardson et al., 2012, p. 366).

Research further indicated that high levels of test-anxiety are related to: a) low or poor self-esteem (Hembree, 1988; Hojat, Callahan, & Gonnella, 2004; Thomas & Gadbois, 2007; Wachelka & Katz, 1999); b) poor study habits, poor study techniques and high procrastination (Cassady, 2004; Hembree, 1988; Naveh-Benjamin, McKeachie, & Lin, 1987; Rasor & Rasor, 1998; Swanson & Howell, 1996); c) feelings of academic overload and poor time-management (Sansgiry & Sail, 2006); and d) poor motivation, negative self-evaluation and concentration difficulties (Swanson & Howell, 1996). The meta-analysis by Hembree (1988), moreover showed that students with high levels of test-anxiety experience a “lower

sense of well-being, less self-acceptance, less self-control, less acceptance of responsibility, lower capacity for status, less tolerance, and lower intellectual efficiency” (p. 56) than students with low levels of test-anxiety.

The review of the literature failed to identify previous research related to students’ adjustment to university and the influence test-anxiety might have. Additionally, test-anxiety has never been used to predict the adjustment and academic performance of historically disadvantaged students in South Africa. Both gaps in current knowledge were addressed by the present study. As indicated by previous research, a negative association between test-anxiety and academic performance is hypothesized. In addition, test-anxiety is tentatively assumed to have a negative relationship with adjustment.

2.4.7 Self-efficacy

Self-efficacy may be defined as “people’s judgement of their capabilities to organize and execute courses of action required to attain designated types of performances” (Bandura, 1986, p. 395). In the context of higher education, self-efficacy refers to an individuals’ ability to independently and efficiently accomplish academic tasks (Schunk, 1991). Students with sufficient levels of self-efficacy may believe in their abilities to perform and carry out tasks at university. They are likely to perceive difficulties and demanding tasks as a challenge and not as a threat. Students with identical skills levels may perform differently academically because of different levels of perceived self-efficacy (Bandura, 1986). Students with high levels of self-efficacy at university have been found to a) experience less stress and to cope better with academic difficulties (Zajacova, Lynch, & Espenshade, 2005); b) receive more social support and to be better integrated academically (Gore, Leuwerke, & Turley, 2005-2006); c) be intrinsically and extrinsically motivated, especially towards academic tasks (Chowdhury & Shahabuddin, 2007; Prat-Sala & Redford, 2012; Reynolds & Weigand, 2010); and d) be more

likely to complete their degree and to be satisfied with their academic progress (Ojeda, Flores, & Navarro, 2011).

Self-efficacy beliefs as possible predictors of academic performance and adjustment have been explored in numerous studies in the psychological and educational literature, showing a consistent and positive relationship between the variables (e.g., Brown, Lent, & Larkin, 1989; Chemers, Hu, & Garcia, 2001; Chowdhury & Shahabuddin, 2007; Crede & Niehorster, 2012; DeWitz & Walsh, 2002; Elias & Loomis, 2000; Finn & Frone, 2004; Hackett, Betz, Casas, & Rocha-Singh, 1992; Hoover, 2003; Klomegah, 2007; Lane & Lane, 2001; Lane, Lane, & Cockerton, 2003; Lent, Brown, & Larking, 1984, 1987; Lent, Taveira, Sheu, & Singley, 2009; Multon, Brown, & Lent, 1991; Ramos-Sanchez & Nichols, 2007; Richardson et al., 2012; Solberg, O'Brien, Villareal, Kennel, & Davis, 1993; Solberg & Villareal, 1997; Vuong, Brown-Weltry, & Tracz, 2010; Zajacova et al., 2005). There is, however, no local research available on students' self-efficacy beliefs and their relationship to academic performance and adjustment at university.

For example, in a study among Bangladesh university students, which examined the relationship between self-efficacy, motivation and academic performance; Chowdhury and Shahabuddin (2007, p. 5) reported a significant relationship between self-efficacy and academic performance ($r = .289, p < .01$). Klomegah (2007) assessed the factors of self-efficacy, personal goals and academic ability in a sample of 103 students to determine if they were better predictors of academic performance than the traditional factor of previous high school performance. Although the study used course grades and not students' overall GPA as dependent variable; a significant relationship was found between self-efficacy and course grades ($r = .32, p < .001$), with self-efficacy also being a significant predictor of students course grades ($\beta = .372, p < .01$) (Klomegah, 2007, pp. 411-412). The study by Fenollar, Roman and Cuestas (2007) tested a conceptual framework with 533 students at a Spanish

university - with the independent variables of self-efficacy, achievement goals and class size, the mediator variable of study strategies, and the dependent variable of academic performance. Results indicated a positive association ($r = .19, p < .01$) between self-efficacy and academic performance (Fenollar et al., 2007, p. 881). Although self-efficacy had no direct effect on students' academic performance, results showed a strong indirect effect on academic performance via study strategies. Their results implied that being confident about one's abilities at university leads to adopting a deep learning approach, which in turn has a positive influence on academic performance.

The meta-analyses by Multon et al. (1991) and Richardson et al. (2012), as well as other research studies (i.e., Lane & Lane, 2001; Lane et al., 2004; Zajacova et al., 2005) confirmed the influence of self-efficacy on academic performance. Self-efficacy has been reported to explain up to 11% of the variance in academic performance among postgraduate students (Lane & Lane, 2001; Lane et al., 2004). Similarly, in a study by Zajacova et al. (2005) with 107 first year students, self-efficacy was found to be the strongest predictor of academic performance. In their assessment of self-efficacy, stress, high school GPA, age, gender, race and language, self-efficacy was a stronger predictor of academic performance than either background variables or previous high school performance. Furthermore, Multon et al.'s (1991, p. 33) meta-analysis of 38 studies published between 1977 and 1988 indicated that self-efficacy is positively related to academic performance, finding a medium mean effect size of $\bar{r} = .35$ ($n = 1\,924, k = 11$) among college students and a medium mean effect size of $\bar{r} = .38$ ($n = 4\,998, k = 38$) among the total sample (including high school students), showing that self-efficacy accounts for up to 14% of the variance in academic performance. Similar results were demonstrated in the meta-analysis by Richardson et al. (2012). Among 67 independent correlations a positive medium mean effect size was reported between academic self-efficacy and academic performance ($\bar{r} = .31, n = 46\,570$), showing that self-

efficacy accounts for up to 10% of the variance in academic performance (Richardson et al., 2012, p. 366).

Previous research also supports a positive link between self-efficacy and students adjustment to university (Byars-Winston, Estrada, Howard, Davis, & Zalapa, 2010; Crede & Niehorster, 2012; DeWitz & Walsh, 2002; Lent et al., 2009; Ramos-Sanchez & Nichols, 2007). For example, Davis (1988) found that self-efficacy is positively related to all four dimensions of adjustment. In a study of 223 first to fourth year undergraduate students, Byars-Winston et al. (2010) showed that self-efficacy was positively associated with interest, degree goals and campus climate. Their results implied that students with higher levels of self-efficacy are more interested in academic activities, more inclined to finish their degree, and better adjusted academically and socially at university. Additionally, Lent et al. (2009), showed in their study of 252 undergraduate psychology, pre-medicine and education students at a Portuguese university, that students were better adjusted academically when they were more confident about their own abilities and skills. The meta-analysis by Crede and Niehorster (2012) further supports the influence self-efficacy has on adjustment. Findings from their review revealed that self-efficacy had the strongest positive relationship with academic adjustment to university ($\bar{r} = .42, n = 988, k = 5$), followed by social adjustment ($\bar{r} = .27, n = 988, k = 5$) and personal/emotional adjustment ($\bar{r} = .27, n = 839, k = 4$), and institutional attachment ($\bar{r} = .17, n = 695, k = 3$), (Crede & Niehorster, 2012, p. 150).

Based on the outlined research the present study hypothesised that self-efficacy is positively related to adjustment and academic performance.

2.4.8 Perceived social support

Social support is commonly defined as “information from other people that one is loved or cared for, esteemed and valued, and part of a network of communication and mutual

obligation” (Taylor, 1999, p. 222). Perceived social support refers to the belief that assistance, help and support is available from parents, family members, friends and significant others when required. Adequate social support for students is instrumental in helping and supporting them in their transition from high school to university, as well as adjusting to the new demands, tasks, responsibilities and requirements of university life. Students entering the university for the first time are also likely to redefine or establish new social support networks. While many students form new supportive networks, students with difficulties in establishing new ties and friendships may lack the support from friends and significant others they need. This may initiate feelings of isolation and alienation at university, which in turn can lead to poor adjustment and academic performance at university. Previous research indicates for example, that students with higher levels of perceived social support are less lonely (e.g., Halamandaris & Power, 1999; Jackson, Fritch, Nagasaka, & Gunderson, 2002; Nicpon, Huser, Blanks, Sollenberger, Befort, & Robinson Kurpius, 2006-2007).

Many students may also experience threats to their self-esteem or their beliefs about their own academic abilities during their first year at university. A supportive social network of family and friends where experiences are shared or discussed may protect or buffer students against negative effects or psychological distress (e.g., Constantine, Wilton, & Caldwell, 2003; Dean & Lin, 1977; Tao, Dong, Pratt, Hunsberger, & Pancer, 2000). Research has shown that students are unlikely to experience or suffer from depression or anxiety if they receive sufficient social support from their families and friends (e.g., Compas, Wagner, Slavin, & Vannatta, 1986; Eldeleklioglu, 2006). Lidy and Kahn (2006) in their research on students’ adjustment to university stated that social support “facilitates the mobilization of interpersonal resources to help students cope with the stress of adjusting to college” (p. 124).

Previous research with undergraduate students has also shown that social support is related to and predictive of academic performance (Barnes, Potter, & Fielder, 1983; Bordes, Sand, Arredondo, Kurpius, & Rayle, 2006; Cutrona, Cole, Colangelo, Assouline, & Russell, 1994; DeBerard, Spielmans, & Julka, 2004) and adjustment (Aspinwall & Taylor, 1992; Friedlander, Reid, Shupak, & Cribbie, 2007; Halamandaris & Power, 1997, 1999; Hertel, 2002; Hinderlie & Kenny, 2002; Holahan, Valentiner, & Moos, 1995; Lidy & Kahn, 2006; Pratt, Hunsberger, Pancer, Alisat, Bowers, Mackey, Ostaniewicz, Rog, Terzian, & Thomas, 2000; Schwitzer, Robbins, & McGovern, 1993; Solberg & Villareal, 1997; Tao et al., 2000).

For example, based on a sample of 418 undergraduate students Cutrona et al. (1994) reported that social support from parents was predictive of students' academic performance; but not social support from friends or romantic partners. Similarly, Bordes et al. (2006) assessed the validity of four different social support measures by studying 112 Hispanic and 597 white first year students. In their analysis, perceived social support from family members was predictive only for the white students' academic performance ($\beta = .148, p < .01$), explaining 2.7% of the variance in performance (Bordes et al., 2006, p. 77). Perceived social support from friends was not predictive of academic performance for either group. Further evidence for a small positive association between perceived social support and academic performance ($\bar{r} = .08, n = 5.840, k = 14$) was provided by Richardson et al.'s (2012, p. 366) meta-analysis.

Empirical evidence is also available on perceived social support and student adjustment to university. Higher levels of social support have been found to lead to higher levels of adjustment to university (e.g., Okun, Sandler, & Baumann, 1988; Wintre & Yaffe, 2000). Results actually suggest that perceived social support may be a better predictor for students' adjustment than their academic performance. For example, Halamandaris and Power (1999, p. 675) found that perceived social support was not related to academic

performance, but predictive of students' psychosocial adjustment to university ($\beta = .35, p < .001$). The more social support students received, the better adjusted they were to university. Similarly, in an earlier investigation by Halamandaris and Power (1997, p. 99), a significant relationship between social support and adjustment ($r = .47, p < .001$) was found with 123 first year students. Students who were well adjusted to university reported to receive more social support than moderately or poorly adjusted students. Furthermore, Tao et al. (2000) indicated that perceived social support is associated with academic, social, and personal/emotional dimensions of adjustment – with the strongest relationship between perceived social support and social adjustment. Similarly, Lafreniere, Ledgerwood and Doherty (1997) demonstrated a significant relationship between social support from family members and social adjustment to university. The higher the level of social support was from family members, the higher was the adjustment of first year students to university. Holahan et al. (1995) found that first year students with higher levels of perceived social support from family members were better adjusted to university than students with lower levels of perceived social support from family members. Additionally, Hertel (2002) reported perceived social support from university friends (but not from friends outside the university) to be predictive of students' academic adjustment, social adjustment and institutional commitment towards university. The study by Friedlander et al. (2007) investigated the relationship of perceived social support, stress and self-esteem on student's adjustment to university with a sample of 115 first year students. Perceived social support from friends was predictive of adjustment but not perceived social support from family members; with higher perceived social support from friends being indicative of better adjustment to university. The latter suggests that perceived social support from friends may be a better predictor variable than perceived social support from family members. However, perceived social support from friends was predictive of overall students adjustment ($\beta = .19, p < .05$), social adjustment ($\beta =$

.20, $p < .05$) and personal/emotional adjustment ($\beta = .19$, $p < .05$) to university; but not towards their academic adjustment (Friedlander et al., 2007, p. 267). Lastly, the meta-analysis by Crede and Niehorster (2012) further established the positive influence social support has on adjustment. Findings from their review revealed that social support from family members ($\bar{r} = .26$, $n = 1\,964$, $k = 13$), social support from parents ($\bar{r} = .21$, $n = 3\,921$, $k = 18$) as well as social support from peers ($\bar{r} = .31$, $n = 2\,850$, $k = 16$) had positive mean effect sizes with all four adjustment variables to university, with social adjustment having the strongest relationship with all social support variables (Crede & Niehorster, 2012, p. 151). Based on the outlined research it is hypothesized for the present study that perceived social support is positively related to adjustment and academic performance.

The present study thus tested the assumption that the inclusion of the additional factors of test-anxiety, self-efficacy and perceived social support will improve the proposed model of Petersen et al. (2009), especially in explaining students' academic performance at university. It is also proposed that an extended model, with additional variables, will further improve on the overall explanation of students' adjustment and academic performance at university. The additional variables included in the extended model were also identified by Robbins et al. (2004) and Le et al. (2005), as well as reviewed in Richardson et al.'s (2012) recent meta-analysis; but not used in the Petersen et al. (2009, 2010) study. The inclusion of these three factors was furthermore informed by two aspects. Firstly, research has indicated that these three factors are important in predicting adjustment to the university and academic performance (e.g., Aspinwall & Taylor, 1992; Barnes et al., 1983; Brown et al., 1989; Crede & Niehorster, 2012; Hancock, 2001; Hembree, 1988; Richardson et al., 2012; Siegel, Galassi, & Ware, 1985). In particular, the analysis by Richardson et al. (2012) showed that test-anxiety and self-efficacy were among the highest correlates of academic performance (on average), out of 50 measures. Secondly, the constructs of test-anxiety, self-efficacy and

perceived social support and their impact on academic success have not been tested previously within the South African context.

2.5 Consideration of moderator variables

The third aim of the present study was to test the extended model for possible moderator effects. Previous research has consistently indicated that correlations between some of the predictor variables and adjustment and academic performance used in the present study vary across demographic characteristics. Previous research has also reported that there are demographic differences among the variables of adjustment and academic performance. That is, results or research findings may be different among different subgroups of students (e.g., psychosocial variables might better explain students' adjustment and academic performance for female than for male students). For example, recent research indicated that students with an urban background perform better academically at university than students with a rural background (Polasek & Kolcic, 2006). Similarly, females and students from a high socio-economic background are believed to perform better academically, compared to males and students with a lower socio-economic background (Dennis, Phinney, & Chuateco, 2005; La Forge & Cantrell, 2003; Robbins et al., 2004; Smith & Naylor, 2001). As such results may not apply equally to all students and should not be generalized, without considering the possible impact a moderator might have. A moderator variable is defined as a variable with the possibility of influencing the significance, magnitude, and relationship between two or more other variables.

The inclusion and identification of moderator variables for the present study was based on a qualitative review of the literature related to the various psychosocial variables, mediator and dependent variable. The review revealed that often used moderator variables in research of students' adjustment and academic performance at university included the

variables of age, gender and race (e.g., Weissberg & Owen, 2005). As the majority of students that participated in the current study were black, the moderator variable of race was not applied. Instead it was decided to include the moderator variable of residence status to the present study – here defined as students living on campus in university residences or off campus in private accommodation for the duration of an academic year. Although this variable has been applied to a lesser extent in previous research, recent findings point towards significant differences among students. Also, as Petersen et al. (2009, 2010)¹² did not conduct a moderator analysis for their suggested model explaining adjustment and academic performance at university; no previous knowledge is available on how their model explains adjustment and academic performance among different subgroups of students. Although the meta-analyses by Robbins et al. (2004), Richardson et al. (2012) and Crede and Niehorster (2012) provided an overview on which and to what extent psychosocial variables influence adjustment and academic performance; they did not account for or reflect on the possible influence of moderator variables. That is, a moderator analysis (e.g., for age, gender, etc.) was not carried out. For example, although Crede and Niehorster (2012) assessed the variables of age and gender and their relationship to adjustment, which was found to be unrelated, they did not test if age or gender functioned as a moderator for the relationship between psychosocial constructs and adjustment. However, it should be noted that meta-analyses are limited “by the quality of the original research findings that are summarized, particularly the quality of research designs” (Crede & Niehorster, p. 158, 2012). Nonetheless, Crede and Niehorster (2012) do acknowledge that, based on their meta-analytic results, “any moderators are likely to have a small effect on the strength of the relationship between adjustment constructs and academic performance (p. 147). Similarly, Richardson et al.’s

¹²Petersen et al. (2009, 2010) did not report a moderator analysis in their published articles. The original dissertation by Petersen (2006) did, however, include a moderator analysis for gender.

(2012) recent meta-analysis specifically acknowledges that to move research forward, moderators have to be identified and tested to ascertain which and for whom psychosocial variables are important predictor variables of academic performance. The present study (to some extent) aims to address this gap. The paragraphs below review the influence (or lack of) moderator variables had in earlier research.

2.5.1 Gender differences and gender as moderator

Previous results about gender differences in academic help seeking behaviour have varied. Some research suggests that female students seek out more help or are more willing to seek help than their male counterparts (e.g., Butler, 1998; Nadler & Fisher, 1986; Ryan, Hicks, & Midgley, 1997; Türküm, 2004 & 2005). Previous research has also indicated that female students have more positive views and attitudes toward seeking psychological help than male students (Addis & Mahalik, 2003; Komiya, Good, & Sherrod, 2000; Koydemir-Özden, 2010; Tedeschi & Willis, 1993; Vogel & Wester, 2003). In addition, female students have been found to utilize psychological services more often than male students (Ang, Lim, Tan, & Yau, 2004; Fischer & Farina, 1995; Morgan, Ness, & Robinson, 2003; Raunic & Xenos, 2008). On the contrary, other research findings indicate that male students are less fearful of seeking help from their teacher, and less concerned “about the negative images and reactions they may provoke in others” (Pajares, Cheong, & Oberman, 2004, p. 498) than female students (Kennedy, 1997; Newman & Goldin, 1990; Newman & Schwager, 1993). On the other hand, studies also indicate that there are no gender differences in students’ help seeking behaviour (e.g., Newman & Schwager, 1993; Ryan & Pintrich, 1997; van der Meij, 1988, 1990) and attitudes toward seeking professional psychological help (Atkinson, Lowe, & Matthews, 1995; Dadfar & Friedlander, 1982; Furnham & Andrew, 1996; Masuda, Suzumura, Beauchamp, Howells, & Clay, 2005). Based on these reported mixed findings, it

is tentatively hypothesized that female students will have a more positive attitude towards help-seeking than male students.

Previous research also showed gender differences in the motivational variables related to academic performance. For example, Nunn (1994) found that women are more achievement-orientated than men and Vallerand et al. (1992) reported that female students have a higher self-determined motivational profile than male students. Women have also been found to be more motivated towards academic activities (Karsenti & Thibert, 1994; Sikhwari, 2007) and to have a higher desire to finish university than men (Allen, 1999). Vermeir and Van Kenhove (2008), Roxas and Stoneback (2004) and Jeffrey, Atkins, Laurs and Mann (2009) reported that males are more externally motivated and females more internally motivated. Similarly, a study with 123 undergraduate students at the University of Cape Town conducted by Muller and Louw (2004) in South Africa found significant gender differences in motivation. Female students displayed higher levels of intrinsic motivation and lower levels of amotivation compared to male students. Therefore, it is hypothesized that female students display higher levels of intrinsic motivation, whereas male students are hypothesized to display higher levels of extrinsic motivation and amotivation.

The meta-analysis of self-esteem by Kling, Hyde, Showers and Buswell (1999) indicated that males score higher on self-esteem measures (i.e., Rosenberg self-esteem scale) than females. This was true for all age groups, except for participants over 60 years of age. Although males were found to display higher levels of self-esteem, the overall difference was small ($\bar{d} = .21, n = 97\ 121, k = 216$) (Kling et al., 1999, p. 470). However, the meta-analysis of Trzesniewski, Donnellan and Robin (2003) did not find any gender differences. Research among student populations for the variable of self-esteem has found mixed results, with either no gender differences (Gloria et al., 1999; Halamandaris & Power, 1997) or females displaying higher levels of self-esteem than males (Phan, 2010). The above mentioned

research focused on global self-esteem. Domain specific self-esteem focuses on specific areas (i.e., academic self-esteem) and may display different results to global self-esteem. The meta-analysis by Gentile, Grabe, Dolan-Pascoe, Twenge, Wells and Maitino (2009) assessed ten specific domains of self-esteem, including academic self-esteem. The results indicated no significant differences between males and females on academic self-esteem. However, a small difference was evident during adulthood (18-22 years of age) with females having higher levels of academic self-esteem than males (Gentile et al., 2009). Hence, no significant gender differences are hypothesized for the variable of self-esteem.

The existing literature suggests that females at university experience higher levels of stress than males (Abouserie, 1994; Baker, 2003; Greer, 2008; Hudd, Dumlao, Erdman-Sager, Murray, Phan, Soukas, & Yokozuna, 2000; Michie, Glachan, & Bray, 2001; Misra & McKean, 2000; Misra, McKean, West, & Russo, 2000; Wohlgemuth & Betz, 1991). Misra et al. (2000) for example, found that females reported a greater number of academic stressors than males; and that females had higher scores on reported self-imposed stressors than males. It is thus hypothesized that female students will demonstrate higher levels of perceived stress at university than male students.

Bitzer and Troskie-De Bruin (2004) surveyed 1 868 first year students at the University of Stellenbosch about their perception of their academic workload at high school. Results indicated that more female students (7.4 %) than male students (3.9%) found their workload at high school overwhelming. Although this is no direct indication of gender differences in perceived workload at university level, one might draw the conclusion that this difference may also be present at tertiary level. This is because the academic workload (time requirements for out of class work, preparation, self-study, assignments, tutorials, etc.) at university is usually higher than at high school. Hence, female students are hypothesized to show higher levels of academic overload at university than male students.

Previous research reports gender differences for students in test-anxiety (e.g., Hembree, 1988; McDonald, 2001; Zeidner, 1998). Numerous findings indicate that female students score higher than male students in test-anxiety (Abdel-Khalek, 2000; Bandalos, Yates, & Thorndike-Christ, 1995; Cassady & Johnson, 2002; Chapell et al., 2005; Crocker, Schmitt, & Tang, 1988; Feingold, 1994; Gierl & Rogers, 1996; Hembree, 1988; McCarthy & Goffin, 2005; Mueller, Jacobsen, & Schwarzer, 2000; Mwamwenda, 1994; Rasor & Rasor, 1998; Rezazadeh & Tavakoli, 2009; Seipp & Schwarzer, 1996). The meta-analysis by Seipp and Schwarzer (1996) across 12 different cultures found gender differences in test anxiety in all countries except for China and Turkey. Meta-analytic findings, however, indicate that gender group differences in test anxiety are rather small (Hembree, 1988; Seipp & Schwarzer, 1996). Subsequently, it is hypothesized that female students will display higher levels of test-anxiety than male students.

Female students generally display lower levels of self-efficacy than male students in traditionally male-dominated subjects (involving quantitative skills, i.e., mathematics, computer; see Betz & Hackett, 1981; Betz & Hackett, 1983; Ferla, Valcke, & Cai, 2009; Hackett, 1985; Lent, Lopez, & Bieschke, 1993; Pajares & Miller, 1994). In a study by Busch (1995) on perceived self-efficacy, gender differences among 154 college students indicated that female students had significantly lower self-efficacy in computing and marketing subjects; but higher self-efficacy levels in statistics than their male counterparts. Reisberg, Bailey, Burger, Hamann, Raelin and Whitman (2010) in a study of 990 first year undergraduate engineering students, found that academic self-efficacy is significantly higher among male students than female students. DeWitz and Walsh (2002), however, reported different findings. They assessed the variable of college self-efficacy among 312 undergraduate students in an introductory psychology course and found that female students had significantly higher levels of self-efficacy than male students. Hence, previous research

indicates that gender differences in self-efficacy at university might be related to specific courses or subjects students are enrolled for. As with previous variables related to academic performance, some of the research showed no significant gender differences (Brown et al., 1989; Hackett et al., 1992; Justice & Dornan, 2001; Luzzo, 1995; Santiago & Einarson, 1998; Williams, 2004) in relation to academic self-efficacy. Based on the diverse findings of previous research for the variable of self-efficacy, no significant gender effects are assumed.

In assessing possible gender difference on the level of perceived social support students receive at university, Lyons, Perrotta and Hancher-Kvam (1988) found that among a class of 92 undergraduate students, no gender differences were reported among students for the amount of perceived social support from family members. However, women reported significantly higher levels of perceived social support from friends than men. Similarly, Rueger, Malecki and Demaray (2008) reported that perceived social support from close friends was higher for girls than for boys at high school. This is in contrast to a study which has found that women at university perceived receiving more social support from both, friends and family, than men (Nicpon et al., 2006-2007). Other research has found no gender differences among students with regard to social support (Gloria et al., 1999; Halamandaris & Power, 1997). According to previous findings, it is hypothesized that female students will report to receiving more social support from their friends than male students; whereas no gender differences are expected for the social support students receive from their family.

Halamandaris and Power (1999) in a study of 183 first year undergraduate students found that females are better adjusted to university life than males. This finding was supported by research from Leong et al. (1997) who studied 161 first year students using the *Student Adaption to College Questionnaire (SACQ)*. Although no statistically significant gender differences were found among the sub-scales of adjustment; there was a trend of female students being better adjusted academically and socially than male students. More

recent research indicated that there is support for the assumption that male students are better adjusted to university than female students (Abdullah, Elias, Mahyuddin, & Uli, 2009; Enochs & Roland, 2006; Wintre & Jaffe, 2000). There is however also other research which has reported no gender differences in academic and social adjustment to university (e.g., Jdaitawi, Ishak, & Mustafa, 2011). As previous research has found rather mixed results, no prediction is made with regard to female or male students being better adjusted to university.

Previous research indicated that female students earn higher grades and perform better academically than male students (Akgun & Ciarrochi, 2003; Baker, 2004; Baker, 2003; Chow, 2007; Dolado & Morales, 2007; Fergusson & Horwood, 1997; Furnham, Chamorro-Premuzic, & McDougall, 2002; Hyde & Kling, 2001; Linver, Davis-Kean, & Eccles, 2002; Spitzer, 2000; Yousefi, Mansor, Juhari, Redzuan, & Talib, 2010). For example, Dayioğlu and Türüt-Aşık (2007) found, in a study with 10343 undergraduate students in Turkey, that women outperform their male counterparts, even after controlling for the field of study and individual attributes. In contrast, a study in South Africa with 200 second year students at the University of Venda found no significant differences among female and male students regarding their academic achievement (Sikhwari, 2007). In line with the dominant trend of results, it is hypothesized that female students will perform better academically than their male counterparts.

In summary, female students are hypothesized to have a more positive attitude towards help-seeking, display higher levels of intrinsic motivation, demonstrate higher levels of perceived stress, show higher levels of academic overload, display higher levels of test-anxiety, report to receive more social support from their friends, and perform better academically than their male counterparts. Male students, on the other hand, are hypothesized to display higher levels of extrinsic motivation and amotivation. No significant gender differences are hypothesized for the variable of self-esteem, self-efficacy and social support

from family members. As previous research has found contradicting results, no prediction is made with regard to female or male students being better adjusted to university.

Davy et al. (2009) tested a model of cheating behaviour which included the factors of motivation, academic performance, neutralization tendencies, self-reported cheating behaviour and likelihood of future cheating. Their model was tested with 2 088 undergraduate students, including 1 140 females and 948 males. Although their model included the variable of academic performance, it was measured with students' self-reported academic marks. Of interest here was the path from motivation to academic performance. Results of their study indicated that introjected regulation was not a significant predictor of academic performance for either males or females. The path for intrinsic motivation to academic performance however, was significant, but there were no gender differences as the path coefficients were identical for males and females ($\beta = .099, p < .01$) (Davy et al., 2009, p. 20). The paths for identified regulation to academic performance and amotivation to academic performance on the other hand, showed that gender acted as a moderator. The effect of identified regulation on academic performance was only significant for male students ($\beta = -.114, p < .05$); whereas the path from amotivation to academic performance was a significant predictor for males ($\beta = -.258, p < .01$) and females ($\beta = -.132, p < .01$), but significantly more important for male students (Davy et al., 2009, p. 20). This indicated that amotivated males performed lower academically than females.

Test-anxiety was one of the few factors identified where previous research has investigated the possible moderating role of gender for the relationship between test-anxiety and academic performance. Previous research suggests that the negative relationship between test-anxiety and academic performance is higher for males than females (McCarthy & Goffin, 2005; Sipos, Sipos, & Spielberger, 1986; Smith, Michael, & Hocesvar, 1990; Spielberger, 1980). For example, Benson, Bandalos and Hutchinson (1994) in a study of 204 male and

412 female college students tested a model to assess which factors influence statistical test-anxiety. Of interest here is the specified path from general test-anxiety to students' achievement which was assessed by the mid-term results of a statistics course. Results showed that general test-anxiety had a significant negative effect on students' achievement, but was a more important predictor for males ($\beta = -.236, p < .05$) than for females ($\beta = -.164, p < .05$; (Benson et al., 1994, p. 139). Although their model included the variable of self-efficacy, it was not found to be a predictor of achievement for either male or female students. McCarthy and Goffin (2005) argued that female students might have more coping resources available to them, both before and during an examination, which may reduce the influence of test-anxiety on academic performance. The variable of test-anxiety illustrates a very important point that may also apply to other variables. That is, although the majority of previous research has shown that test-anxiety is higher among females than males, it also indicated that the impact test-anxiety has on academic performance is stronger for males than for females. This shows why it is so important to identify and assess moderator variables, as there might be differences in how specific psychosocial variables influence students' adjustment and academic performance for different groups of students.

This is further illustrated by the meta-analysis from Seipp (1991). It is important to emphasize, however, that the study focused on general anxiety rather than test-anxiety. Seipp's (1991) study investigated the influence general anxiety has on academic performance in studies conducted in Germany, United States of America and other countries¹³. Results showed no gender differences for the effect of anxiety on performance among the German sample with both males ($\bar{r} = -.183, n = 2\ 154, k = 9$) and females ($\bar{r} = -.175, n = 2\ 092, k = 9$) being equally negatively affected (Seipp, 1991, p. 33). Also, no gender differences for the

¹³ No indication was made by Seipp (1991) as to the composition of other countries. It is therefore unknown to which countries 'other countries' refers.

effect of anxiety on performance was found among ‘other countries’ with both males ($\bar{r} = -.206, n = 4310, k = 9$) and females ($\bar{r} = -.213, n = 693, k = 7$) being equally negatively affected (Seipp, 1991, p. 33). For the sample of studies conducted in the USA, however, gender moderated the effect of anxiety on performance, with females ($\bar{r} = -.241, n = 2\,926, k = 22$) exhibiting a stronger negative relationship than males ($\bar{r} = -.167, n = 3\,937, k = 18$) (Seipp, 1991, p.33). Seipp (1991) suggested that gender might only moderate the relationship between anxiety and performance in the USA and not among different countries/cultures.

Ojeda et al. (2011), in a study with 457 Mexican American students, evaluated a social cognitive model to explain students’ academic and life satisfaction. Academic satisfaction may be seen as synonymous to academic adjustment. Among the specified paths in their model was also a path from self-efficacy to academic satisfaction. Results of a multiple group analysis indicated however that all paths were invariant for gender.

The only other identified research which previously assessed the moderating function of gender on the relationship between psychosocial factors and adjustment and academic performance is the study conducted by Petersen (2006) at the University of Cape Town with historically disadvantaged undergraduate students. Among the included psychosocial variables of help-seeking, motivation, self-esteem, perceived stress and academic overload; gender moderated several relationships - for adjustment and academic performance. The paths for introjected regulation to adjustment, self-esteem to adjustment and stress to adjustment indicated that gender acted as a moderator. The effect of introjected regulation on adjustment was only significant for male students ($\beta = .184, p < .05$); whereas the effect of self-esteem on adjustment was only significant for female students ($\beta = .376, p < .001$) (Petersen, 2006, p. 88). The path from stress to adjustment was a significant predictor for males ($\beta = -.531, p < .001$) and females ($\beta = -.216, p < .01$), but significantly more important

for male students (Petersen, 2006, p. 88). Similarly, the paths from amotivation to academic performance, self-esteem to academic performance, academic overload to academic performance, and adjustment to academic performance also showed that gender acted as a moderator. The effect of self-esteem on academic performance ($\beta = .197, p < .05$), effect of academic overload on academic performance ($\beta = -.330, p < .001$), and effect of adjustment on academic performance ($\beta = .358, p < .01$) were all only significant for male students; whereas the effect of amotivation on academic performance was only significant for female students ($\beta = -.399, p < .001$) (Petersen, 2006, p. 88).

As there are only limited studies which have previously assessed the possible moderating effect of gender on the relationship between psychosocial variables and adjustment and academic performance it is difficult to predict and formulate hypotheses for all relationships. Based on the reported research it is hypothesized that introjected regulation is an important predictor for adjustment for male students; while self-esteem is expected to be an important predictor for adjustment for female students. Additionally, perceived stress is predicted to be an important predictor of adjustment for all students, but considered to be more important for male students. It is also hypothesized that the paths from identified regulation, self-esteem, academic overload and adjustment to academic performance are significant for male students; whereas the path from amotivation to academic performance is predicted to be important for female students [although Davy et al. (2009) found this path to be significant among all students and more important for male students]. Furthermore, the effect of test-anxiety on academic performance is assumed to be significant for all students, but a more important predictor for male students. Finally, gender is hypothesized not to moderate the paths between intrinsic motivation and academic performance nor between self-efficacy and academic performance. No previous moderating tests were found for the relationships between help-seeking, intrinsic motivation, academic overload, test-anxiety,

self-efficacy, perceived social support from friends, perceived social support from family members and adjustment; nor for the relationships between help-seeking, perceived social support from friends, perceived social support from family members and academic performance. These relationships are also tested and elaborated in the present study.

2.5.2 Age differences and age as moderator

Previous research indicates that older students are more likely to attend university because of being internally motivated (Klein, 1990; Nunn, 1994), whereas younger students are more likely to display external motivations (Jacobson, 2000). In a study with 566 undergraduate students Isiksal (2010) reported that older students were more intrinsically motivated than younger students. Similarly, Jeffrey et al. (2009) studied 1 811 students in New Zealand and also found that older students were more intrinsically motivated than younger students. Studies by Justice and Dornan (2001) and Bye, Pushkar and Conway (2007) however, reported that younger and older age college students did not differ in their motivations to achieve at university. It is thus hypothesized that older students will display higher levels of intrinsic motivation whereas younger students will display higher levels of extrinsic motivation.

Malefo (2000) indicated that student stress decreases with decreasing age. First year students reported higher levels of stress than second year students, and third and fourth year students had lower levels of stress than first or second year students. Similarly, Michie et al. (2001) in a study with 112 undergraduate psychology students reported higher levels of academic stress for younger students. Therefore, younger students are hypothesized to show higher levels of perceived stress than older students.

Results on age differences in test-anxiety at university are inconsistent. Older university students have been found to display lower levels of anxiety related to their

academic performance (Mueller et al., 2000; Nunn, 1994; Yarbrough & Schaffer, 1990). Other findings of age differences in test anxiety reported that younger students have lower test anxiety compared to older students (Baloğlu, 2003; Sansgiry & Sail, 2006). The studies of Justice and Dornan (2001) and Rasor and Rasor (1998), in contrast, reported no age difference. As a result of previous inconsistent findings, no prediction is made for the variable of test-anxiety.

Age differences in terms of academic self-efficacy have been less reported in the literature. In a study at the Queensland University of Technology in Australia with 1 193 first year undergraduate students McKenzie and Gow (2004) found that older students displayed higher levels of self-efficacy than younger students. As with previous variables related to academic performance, some of the research showed no significant age differences in relation to academic self-efficacy (Justice & Dornan, 2001). It is therefore hypothesized that older students will display higher levels of self-efficacy than younger students at university.

In assessing possible age differences in the level of perceived social support students receive at university, Lyons et al. (1988) found that in a class of 92 undergraduate students, no age differences existed in the measure of perceived social support from friends or family. Hence, it is hypothesized that students do not differ in terms of perceived social support.

Graham and Donaldson (1999) indicated that younger college students were predominantly involved with similarly aged students on campus and in peer-related activities, whereas older college students participated less in campus activities and tended to devote more time for family members. Hence older students might display less (social) adjustment to university. However, Ramsay et al. (2007) reported no significant difference between young and older students' level of adjustment to university in their sample of 280 first year undergraduate students at an Australian university. Additionally, no differences in students' academic and social adjustment to university were reported amongst a sample of 289 first

year students in North Jordan (Jdaitawi et al., 2011). Contrary to the findings mentioned above, Clifton et al. (2008) reported that older students were better adjusted to university than younger students in their sample of 854 undergraduate students at a Canadian university. Following the major trends of findings, it is hypothesized that younger students will be better adjusted socially at university than older students; and that younger and older students do not differ in terms of academic adjustment to university.

In terms of academic performance, older students have been found to perform as well academically as younger students and to earn higher grades than younger students (e.g., Baker, 2003; Cantwell, Archer, & Bourke, 2001; Clifton et al., 2008; Etcheverry, Clifton, & Roberts, 2001; Graham & Donaldson, 1996; Kasworm, 1990; Malefo, 2000; Richardson, 1995; Richardson & King, 1998; Sheehan, McMenamin, & McDevitt, 1992; Spitzer, 2000). For example, Carney-Crompton and Tan (2002) found that older students performed better academically than younger students. Similarly, Kember and Harper (1987) indicated that older students perform better academically than younger students. In contrast, there are also studies which have found no significant differences in academic performance due to age (e.g., Farsides & Woodfield, 2007; Justice & Dornan, 2001; Ting & Robinson, 1998), whereas other studies have found that younger students are more successful (i.e., Clark, 1993). Considering the trends of findings, it is hypothesized that older students will perform as well academically at university as younger students.

In summary, younger students are expected to display higher levels of extrinsic motivation, to have higher levels of perceived stress and to be better adjusted socially to university than older students. Older students are hypothesized to have higher levels of intrinsic motivation and self-efficacy than younger students; and to perform as well academically as younger students. Additionally, it is predicted that younger and older students will not differ in terms of their academic adjustment to university and in the amount

of social support they receive from friends and family members. As previous findings for test-anxiety have been contradicting, no prediction is made for the present study.

Multon et al's. (1991) meta-analysis investigated the moderator effect of age for the relationship between self-efficacy and academic performance. However, the influence of self-efficacy on academic performance was compared between older students (high school and college students) and younger students (elementary school children); and not between younger and older university students as in the present study. Their findings may therefore not apply to university students. Nonetheless, results showed that the relationship between self-efficacy and academic performance was more important (higher) for older students. Older students might therefore benefit more from programs improving their self-efficacy which will help them perform better academically. Multon et al. (1991) argues that older students have more experience and know their relative academic strengths and weaknesses and therefore better estimate their level of self-efficacy. Based on previous research by Multon et al. (1991) it is hypothesized that self-efficacy is an important predictor for academic performance for older students. No further research was identified which previously tested the moderator effect of age for the relationships between psychosocial variables (variables included in the present study) and adjustment or academic performance. This gap was addressed in the present study.

2.5.3 Residence status differences and residence status as moderator

Less research has assessed and reported differences in terms of students living on or off campus with regard to the psychosocial variables of the current study (or part thereof). One exception is the study by Gloria et al. (1999) with 98 African American undergraduate students, who found no significant differences between students living on or off campus among the variables of self-esteem, self-efficacy, stress and social support.

Three previous studies were identified which assessed if there are differences between students living on or off campus in terms of their academic performance. An early study by Graff and Cooley (1970) with 185 students living on campus and 116 students living off campus found no difference in their academic performance. This result should, however, be interpreted with caution as it compared students' academic performance after only one semester and not for the whole first academic year. A later study by Blimling (1999) nonetheless supported these early findings. In a review of 21 studies Blimling (1999) indicated that there was no significant difference in academic performance between students living on campus in university residences and students living off campus at home. In a more recent study of 401 first year college students, however, Nicpon et al. (2006-2007) reported higher academic performance for students who lived on campus than those who lived off campus.

Murtaugh, Burns and Schuster (1999) found that students who lived off campus had a higher dropout rate than students who lived in university residences. Furthermore, in a recent local research study by Jones et al. (2008), students living in university residences during the academic year were found to be better adjusted socially to university life than students who lived off campus. It is thus hypothesized that students who live in a university residence on campus during the academic year will perform better academically and be better adjusted socially than students who reside off campus or in private accommodation. No differences are expected for the variables of self-esteem, perceived stress, self-efficacy and social support for students living on or off campus during the academic year.

No research was identified which previously tested the moderator effect of students' residence status for the relationships between psychosocial variables (variables included in the present study) and adjustment or academic performance. These relationships are tested for possible moderation and elaborated in the present study.

In summary, the review of psychosocial variables showed that there is empirical support for the assumption that the factors of help-seeking, motivation, self-esteem, perceived stress, academic overload, test-anxiety, self-efficacy and perceived social support are related to and predictive of student adjustment and academic performance at university. This may lead towards one important conclusion. That is, the good predictive nature of psychosocial variables for students' academic performance at university, as indicated by numerous studies (e.g., Abdullah et al., 2009; Crede & Niehorster, 2012; DeBerard et al., 2004; Lane & Lane, 2001; Lane et al., 2004; Richardson et al., 2012; Robbins et al., 2004; Russell & Petrie, 1992; Solberg & Villareal, 1997; Tracey & Sedlacek, 1984, 1985; Zajacova et al., 2005). This questions the practice of traditional measures (e.g., high school grades, university aptitude scales, etc.), especially locally, to account for students' academic performance at university. As such, psychosocial factors might be used to determine and identify what kind of support students need to perform better academically and to be successful at university; as well as to inform universities what type of support structures are beneficial to students and where available resources could be effectively utilized or put into place.

To conclude, the literature review further indicated that studies in South Africa related to the adjustment and academic performance of university students are limited and mainly concentrated on academic factors, cognitive factors or a combination of both; with academic factors being used most frequently. Only a limited number of studies focused on additional factors, such as demographics (Beneke & Beeming, 2011), student wellness (Lingen, Douman, & Wannenburg, 2011), students or lecturers perception of what constitutes academic success (Fraser & Killen, 2005; Ngidi, 2007), or psychosocial factors (Davidowitz & Schreiber, 2008; Malefo, 2000; Sikhwari, 2007) to explain students' adjustment and academic performance at university in South Africa. Also, the focus has been almost entirely on academic performance with research on students' adjustment to university being very

limited; despite the significance that has been established regarding the relationship between adjustment and academic performance and the key role adjustment plays in explaining academic performance of students at university (e.g., Crede & Niehorster, 2012; Petersen et al., 2009, 2010; Sennett et al., 2003; Sommer & Dumont, 2011; Strahan, 2003). Academic factors encompassed the constructs of lecture or class attendance (e.g., Müller, Swanepoel, & De Beer, 2010; Steenkamp, Baard, & Frick, 2009; Swanepoel, De Beer, & Müller, 2009; Thatcher, Fridjhon, & Cockcroft, 2007; Thatcher, Rosenstein, Grootenhuis, & Haiden, 2010; van Schalkwyk, Menkveld, & Ruiters, 2010), matric marks or previous academic performance (e.g., Bothma, Botha, & LeRoux, 2004; Downs, 2009; Huysamen, 2000, 2002; Jawitz, 1995; Potter & van der Merwe, 1994), work status or experience (e.g., Welman, 2003) and English language proficiency (e.g., Naude, Jansen, Greyling, & Esterhuyse, 2011; Pretorius, 2002; Stephen, Welman, & Jordaan, 2004). Cognitive factors included the constructs of verbal and numerical aptitude (e.g., Kotze & Griessel, 2008) and learning potential (e.g., van der Merwe & de Beer, 2006); whereas previous psychosocial factors included the variables of stress, motivation, attitude and self-esteem (e.g., Davidowitz & Schreiber, 2008; Goodman et al., 2011; Malefo, 2000; Sikhwari, 2007).

In order to advance research and to ascertain how previous knowledge applies to the South African context more research is essential. This is especially important in light of the continuing high number of student dropouts from university, low retention rates and poor graduation rates. Further research not only needs to test simple relationships previously untested among historically disadvantaged students (and university students in general), but also more complex interactions. Here the research by Petersen et al. (2009), who tested a theoretically based psychosocial model to explain and predict students' adjustment and academic performance at university, offers a starting point to move research forward. By including additional theoretically identified and previously untested variables; the aim of the

present research is not only to replicate Petersen et al.'s (2009) model, but also to theoretically extend it and improve on the variance it may explain for adjustment and academic performance among historically disadvantaged students. A further aim is to test and identify possible moderator effects for the variables in the model. Identifying and testing for possible moderator effects has rarely been done in previous research concerned with explaining or predicting student adjustment and academic performance at university. The next part of the literature review details the research model of the present study and summarizes all hypotheses based on the presented literature.

2.6 Research model and summary of hypotheses based on previous research

The model of the present study is illustrated in Figure 2 and depicts the hypothesized relationships of the independent variables to the mediator variable and dependent variable. The independent variables included help-seeking, intrinsic motivation, external regulation, identified regulation, introjected regulation, amotivation, self-esteem, perceived stress, academic overload, test-anxiety, self-efficacy, perceived social support from friends and perceived social support from family.

Adjustment to university was the mediator variable, whereas academic performance was the dependent variable. The path model included all of the original variables used by Petersen et al. (2009) and the additional variables of test-anxiety, self-efficacy, perceived social support from friends and perceived social support from family which have not previously been used in a South African context to predict the adjustment and academic performance of students at university.

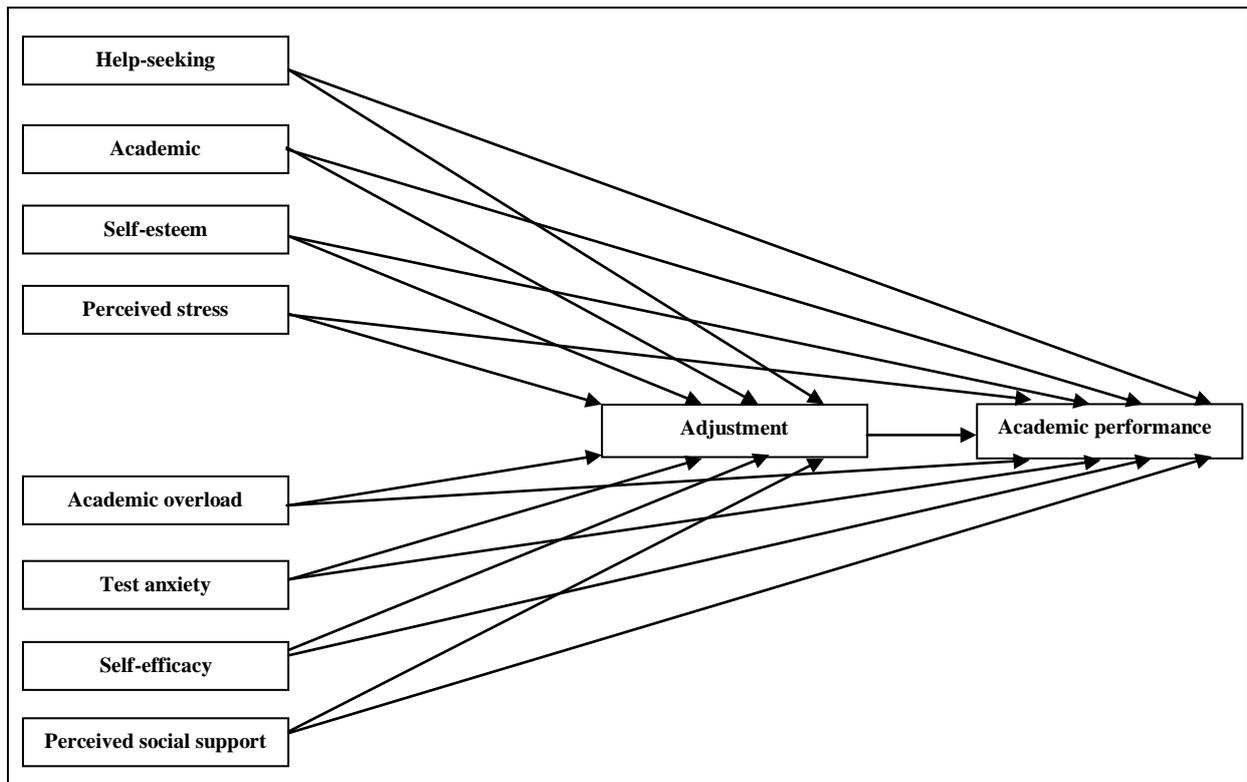


Figure 2. Research design depicting the relationships of the independent variables to the mediator variable and dependent variable

The research was designed to test four different hypotheses: first, to test the relationships between the independent variables, mediator variable and dependent variable; second, to replicate that the partially mediated model proposed by Petersen et al. (2009) exceeds the alternative models that assume total mediation of the psychosocial factors on academic performance via adjustment and only direct effects between psychosocial factors, adjustment and academic performance, respectively; third, to extend the original model by Petersen et al. (2009) by including the constructs of test-anxiety, self-efficacy and perceived social support from friends and family and to test if the extended model explains more of the variance in adjustment and academic performance and fits the data better than the proposed model by Petersen et al. (2009); and finally, to test whether the factors of gender, age and students' residence status moderate the psychosocial variables in predicting adjustment and

academic performance at university. The detailed hypotheses of the study are outlined below:

2.6.1 Hypothesis 1 – Relationships between independent variables, mediator variable and dependent variable

The independent variables of help-seeking, intrinsic motivation, self-esteem, self-efficacy, perceived social support from friends and perceived social support from family members will have a positive relationship with adjustment and academic performance (H1.1). The independent variables of extrinsic motivation, amotivation, perceived stress, academic overload and test-anxiety will have a negative association with adjustment and academic performance (H1.2). Adjustment will have a positive relationship with academic performance (H1.3).

2.6.2 Hypothesis 2 – Model Comparison

The partially mediated model proposed by Petersen et al. (2009) will exceed the alternative models to predict the adjustment and academic performance of students at the University of Fort Hare. Specifically, the partially mediated model will explain more of the variance in adjustment and academic performance than the direct or completely mediated model (H2.1). Furthermore, the variables of help-seeking, intrinsic motivation, identified regulation, and self-esteem will have positive associations with adjustment and academic performance (H2.2). The variables of external regulation, introjected regulation, amotivation, academic overload and perceived stress will have negative associations with adjustment and academic performance (H2.3). Adjustment will have a positive association with academic performance (H2.4).

2.6.3 Hypothesis 3 – Model Extension

The extended model with the added paths of self-efficacy, test-anxiety, perceived social support from friends and perceived social support from family will explain more of the variance in adjustment and academic performance of students at university than the original model proposed by Petersen et al. (2009) (H3.1). Furthermore, self-efficacy and the social support variables will have positive associations with adjustment and academic performance (H3.2). The variable of test-anxiety will have negative associations with adjustment and academic performance (H3.3). Adjustment will have a positive association with academic performance (H3.4).

2.6.4 Hypothesis 4 – Age, gender, and students' residence status as moderators

a) Gender differences

i) Female students were hypothesized to have a more positive attitude towards help-seeking, display higher levels of intrinsic motivation, demonstrate higher levels of perceived stress, show higher levels of academic overload, display higher levels of test-anxiety, receive more social support from their friends, and perform better academically than their male counterparts (H4a1).

ii) Male students were hypothesized to display higher levels of extrinsic motivation and amotivation than female students (H4a2).

iii) No significant gender differences were hypothesized for the variable of self-esteem, self-efficacy and social support from family members (H4a3).

iv) As previous research has found contradicting results, no prediction was made with regard to female or male students being better adjusted to university.

v) It was further hypothesized that introjected regulation is an important predictor for adjustment for male students; self-esteem is an important predictor for adjustment for female

students; and perceived stress is an important predictor of adjustment for all students, but more important for male students (H4a4).

vi) It was also hypothesized that the paths from identified regulation, self-esteem, academic overload and adjustment to academic performance are significant for male students; whereas the path from amotivation to academic performance was predicted to be important for female students. Furthermore, the effect of test-anxiety on academic performance was hypothesized to be significant for all students, but to be a more important predictor for male students (H4a5).

vii) Finally, gender was hypothesized not to moderate the paths between intrinsic motivation and academic performance and between self-efficacy and academic performance (H4a6).

b) Age differences

i) Older students were hypothesized to be more intrinsically motivated, to have higher levels of self-efficacy than younger students at university and to perform better academically than their younger counterparts (H4b1).

ii) Younger students were expected to display higher levels of extrinsic motivation, to have higher levels of perceived stress and to be better adjusted socially to university than older students (H4b2).

iii) Also, no significant age differences were hypothesized for the variables of academic adjustment to university and perceived social support from friends and family members (H4b3).

iv) No prediction was made for the variable of test-anxiety as previous research has been inconsistent.

v) Also, it was hypothesized that self-efficacy is an important predictor for academic performance for older students (H4b4).

c) Differences for students residing on campus or off campus

i) Students who reside in a university residence during the academic year will perform better academically and receive higher grades, as well as be better adjusted socially to the university than students who reside off campus and live in private accommodation (H4c1).

ii) In addition, no differences are expected for the variables of self-esteem, perceived stress, self-efficacy, perceived social support from friends and perceived social support from family members for students living on or off campus during the academic year (H4c2).

iii) Finally, it was tentatively predicted that a student's residence status will function as a moderator variable and that there will be path differences between students living on campus and off campus for the independent variables on adjustment and academic performance (H4c3).

The final section of the literature review details the context of the research study. Here, background information about the locality, the institution and its students is presented. This information needs to be considered when comparing results of the present study to similar and previous research on students' adjustment and academic performance at university.

2.7 Research context of the present study

The present study investigated the influence of psychosocial variables on students' adjustment and academic performance at the University of Fort Hare. The University of Fort Hare is classified as a historically disadvantaged university, with limited resources and a predominantly black and poor student population. Although the student population at Fort Hare University increased by 15% from 8590 students in 2006 to 10111 students in 2009, the university relies largely on black Eastern Cape matriculants (6378 in 2006 and 7662 in 2009; see Santed, 2009). As it is located in one of the poorest provinces (Eastern Cape) in the

country, it brings with it the legacies and consequences of socio-economic underdevelopment (e.g., low resources, poor infrastructure and poor high school education as indicated by low matric pass rates). For example, the Matric pass rate of high school students in the Eastern Cape was only 58.3% in 2010 and 58.1% in 2011 (Mbabela & de Jager, 2013). Letseka (2001) and Letseka, Breier and Viseer (2009) argue that the majority of students attending UFH originate from rural areas and with a socio-economically disadvantaged background. Thus, the majority of students entering the university come from resource-poor environments which have not adequately prepared them for tertiary studies.

The Petersen et al. (2009, 2010) study was conducted with disadvantaged students on need-based financial aid at the University of Cape Town (UCT). Comparing the two institutions indicates that they are rather dissimilar. Not only is UCT considered to be a historically advantaged university, there are distinct differences which sets the two institutions apart. In 2012, UCT was ranked the top academic university in South Africa and Africa, and is currently ranked at number 390 internationally according to the Ranking Web of Universities (Webometrics, 2012, 2013) and among the top 300 universities according to the Institute of Higher Education of Shanghai Jiao Tong University (ARWU, 2012). The University of Fort Hare has a historical background that is different to the University of Cape Town. It is much smaller in terms of its student population and the degree programs it offers; and it is currently ranked at number 66 in Africa and at number 3 954 internationally (Webometrics, 2013). Furthermore, the University of Cape Town has a much higher graduation rate, more academic staff with doctoral degrees and a higher research output. For example, in 2007 the University of Cape Town had 4483 graduates (UCT graduation results, 2007) compared to 1609 graduates from Fort Hare (Council on Higher Education, 2009). In terms of publication output units in 2007, the University of Cape Town reported 917.7 units (UCT Research Office, 2010) compared to only 88.2 units from Fort Hare (Council on

Higher Education, 2009). While the study conducted by Petersen et al. (2009) focused on a minority group of students within the University of Cape Town context, the present study addressed similar students as Petersen et al. except that these students more or less present the majority of students at the University of Fort Hare. The subsequent paragraphs illustrate student demographics at UFH for the last few years, as well as student dropout and graduation rates.

The high dropout and low graduation rate South African universities are experiencing are also present at the University of Fort Hare. Data on student dropout and graduation collected and compiled by the university's Planning Office at UFH confirmed this concern. The following tables provide a brief overview of the situation at UFH over the past few years. As indicated in Table 2 below, UFH attracts a considerable number of first year undergraduate students each year, which has steadily risen over the past three years to 2456 new first time entering undergraduate students in 2010.

Table 2

New First Year Undergraduate Students at UFH, by Year

Year	2006	2007	2008	2009	2010
Students (N)	1989	2475	2245	2359	2456

The majority of new undergraduate students seeking an academic qualification at UFH come from the historically disadvantaged groups. As indicated in Table 3, over the last five years the intake of new undergraduate students at UFH, on average, was comprised of 93% black, 2% coloured, 1% Indian and 4% white students. Additionally, there has been a steady increase in black first year undergraduate students over the last three years from 2105 students in 2008 to 2287 in 2010.

UFH offers both three year and four year undergraduate degree programs; and the dropout and retention rates of students indicate that differences exist not only across faculties but also across three and four-year degree programs. As illustrated in Table 4 and 5 the annual dropout rate (i.e., how many students are lost from the institution in one year) for three-year programs is considerably higher than those for four-year programs.

Table 3

New first Year Undergraduate Students at UFH, by Year and Race

<u>Race</u>	<u>Year</u>					<u>Total</u>
	2006	2007	2008	2009	2010	
Black	1834	2312	2105	2197	2287	10735
Coloured	40	61	56	47	66	270
Indian	14	13	9	12	14	62
White	101	89	75	103	89	457
Total	1989	2475	2245	2359	2456	11524

Table 4

Dropout Rate for Three-Year Programs at the End of First Year of Study (in %)

<u>Faculty</u>	<u>2006-2007</u>	<u>2007-2008</u>	<u>2008-2009</u>	<u>2009-2010</u>
Management & Commerce	17.8	21.9	13.2	16.8
Science & Agriculture	10.5	21.8	7.9	13.5
Social Science & Humanities	23.8	19.1	23.6	17.9
UFH Total	18.4	20.9	15.6	16.2

For example, the total dropout rate for first year students for three-year programs in 2009 was 16.2% compared to four-year programs with only 7.7%. Although the reported

dropout rates for first year students at the UFH are lower than those reported by the Department of Education in 2005 (30%) and HSRC in 2007 (40%) they are still substantial; especially as one has to consider that additional students will be lost in subsequent years of academic study. For three-year programs, the highest dropout rate for first year students in 2009 was in the faculty of Social Science and Humanities with 17.9%. For four-year programs the faculty of Law displayed the highest dropout rate with 21.5%.

Table 5

Dropout Rate for Four-Year Programs at the End of First Year of Study (in %)

Faculty	2006-2007	2007-2008	2008-2009	2009-2010
Education	21.2	19.0	9.1	10.9
Law	17.6	25.8	14.6	21.5
Science & Agriculture	1.9	3.2	1.4	4.7
Social Science & Humanities	13.4	4.0 ¹⁴	0 ⁶	0 ⁶
UFH Total	12.9	11.8	5.2	7.7

Table 6 below indicates in percent the rate of students that graduated at UFH over the last few years. The graduation rate for students is displayed once for the minimum / regular time of study - expressed here as (n); and for students who needed two additional years to graduate - expressed here as (n+2). Results indicated that for three-year programs, students always had a higher graduating rate for (n+2) than (n) at UFH. For four-year programs the situation was similar. More students tended to graduate after additional years of study, except for the 2006 academic year. Although the graduation rate of undergraduate students at UFH

¹⁴This indicates/includes students transferring from other institutions and faculties into the Faculty of Social Science & Humanities. More students entered / transferred into the Faculty of Social Science & Humanities during a year than were lost in a year.

is above the rate reported by the Department of Education in 2005 and HSRC in 2007 it remains relatively low. This is especially true for three-year degree programs, where not even one third of all undergraduate students graduate in the specified time frame and where only half the students are able to successfully complete their studies after two additional years. Hence, it remains doubtful if the remaining students (and that includes students from both three and four-year degree programs) that have not graduated after two additional years will be successful after subsequent years of study – or if they will eventually drop out of the institution without graduating. Thus, identifying which psychosocial variables predict students’ adjustment and academic performance at university may play a vital role. For example, it may inform and assist universities in their efforts to enhance, redefine or adjust current student development and support programs. It may also lead towards developing completely new methods or approaches to assist and help students during their time at university.

Table 6

Institutional Undergraduate Graduation Rates for Three and Four-Year Degree Programs, in (n) and (n+2) for 2006 to 2009, in (%)

Type of degree program	Graduating by	2006	2007	2008	2009
3 year	n	22.8	18.6	29.6	26.9
3 year	n+2	27	57.3	43.8	50.1
4 year	n	34.8	44.6	41.2	48.8
4 year	n+2	24	74.9	63.6	62.1

Chapter III: Method

Two cross-sectional surveys were conducted over a period of two years (2008 and 2010, respectively) with students at the University of Fort Hare using the non-probability sampling technique of convenience sampling. Students had to meet the following set of criteria for inclusion in the study: a) be registered for a full-time degree at UFH; b) be registered for undergraduate studies; and c) be either in their first or second year of study. In total 398 students responded to the online questionnaire. In total, 64 responses were discarded because they contained incomplete data; a further 49 responses were excluded from further analysis because they were duplicates from students; and 5 responses were dismissed because students were registered for postgraduate studies. A total of 280 students met the outlined criteria and were included into data analysis.

3.1 Procedure

All 1st and 2nd year students of the University of Fort Hare were approached and contacted via e-mail, inviting them to participate in the study. Contacting students via email is the best method for inviting them to participate as all students are assigned an e-mail address at registration and this is the manner in which university personnel contacts them. The students' e-mail addresses were obtained from the registrar's office. Students received a total of five e-mails including a brief description of the study and procedure to be followed in filling out the online questionnaire (see Annexure A). This included four reminders to participate.

In order for participants to access the questionnaire electronically, it was designed and placed online with an online survey tool called SurveyMonkey (see www.surveymonkey.com). SurveyMonkey is highly customizable and user friendly. For example, SurveyMonkey was able to accommodate a variety of scales and different answer

formats, which was ideal for the current study. Both surveys were conducted at similar time periods over the duration of approximately seven weeks, that is, from the 1st of October up until the end of the academic year.

Students were informed that participation in this study was voluntary and that they were able to withdraw or discontinue participation at any time. Students were also informed that their responses will be kept confidential. All students completing the questionnaire were entered into a lucky draw with a chance to win the first prize of a remuneration of R 2000. The questionnaire took approximately 40 minutes to complete. Approval and ethical clearance for this study was obtained from the university's Planning Office. After the data collection process was finalized, the lucky draw was carried out and one participant was the lucky recipient of R 2000.

3.2 Research measures

The present study used a number of quantitative self-report measures to assess the independent and mediator variables. The students' academic performance as dependent variable was conceptualised as final academic year marks which were obtained from the university's Planning Office. The scales used for the present study as well as how the academic marks were calculated are discussed in the next section.

3.2.1 Demographic measures

Demographic measures included information about the participants' age¹⁵, gender, population group, mother tongue or first language, current year of study at UFH, what kind

¹⁵ This study distinguishes between younger and older students. Participants aged 17 – 20 are referred to as 'younger students'; whereas participants aged 21 years and above are referred to as 'older students'.

of high school students attended (i.e., government, private or mission), and whether the participants reside on or off campus during the academic year.

3.2.2 Independent measures

One major methodological concern for the present study was the overall length of the questionnaire and the total answering time for students. Research has shown that shorter instruments or measures are less intimidating for participants. Participants in a research study are also more likely to complete a particular scale in full, if the measure is time-efficient and includes fewer items as opposed to a large number of items (Lounsbury, Gibson, & Soudargas, 2006; Madonna & Ponterotto, 2006). If the instrument is too long, participants might become distracted more easily, skip items, lose interest and concentrate less. In contrast to the study conducted by Petersen et al. (2009) – the present study included a number of additional constructs that were assessed simultaneously. Hence, the overall length of the questionnaire was increased significantly. Furthermore, as the present study was conducted by means of an online survey, a concern was the amount of time and access students had to a computer on campus, as access and availability is sparse and limited at UFH.

In an effort to curtail the length while still retaining the additional constructs of the overall questionnaire and keeping within an acceptable time limit; a number of scales were shortened and only included a limited number of items of the full scale to form measures for the present study. It is acknowledged that this may have influenced the psychometric properties of the items and the reliability of the measures. The inter-item total correlation as well as the reliability of all scales is thus reported in Chapter IV under preliminary analysis. The selected items were chosen based on content and face validity and on the grounds that they were thought or believed to be related to adjustment and academic performance.

3.2.2.1 Help seeking

Help seeking was assessed differently from Petersen et al. (2009) by using an adaptation of a 6-item help seeking attitude scale developed by Karabenick and Knapp (1991, p. 223). The wording of one item in the scale was changed to accommodate the current study. That is, the word “tutoring” was replaced with the word “help”. The answer format used was a Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). In the present study 4-items were included which measure students' perceptions of seeking help in an academic setting. Two items were excluded because of measuring a “threat to self-esteem engendered by help seeking” (Karabenick & Knapp, 1991, p. 223) for which the scale was originally designed. The items were reversed and consequently, a higher score indicates a positive attitude towards help seeking. Karabenick and Knapp (1991) reported a reliability of .74 for the 6-item scale. An example of items included in this scale is, “Getting help in my academic work would be an admission of my own lack of ability or ignorance”.

3.2.2.2 Academic motivation

Academic motivation was measured by the *Academic Motivation Scale*¹⁶ (AMS) developed by Vallerand et al. (1992), which is based on Deci and Ryan’s self-determination theory (SDT) (Deci, Vallerand, Pelletier, & Ryan, 1991). The scale was designed to measure to what extent an individual’s academic motivation is internally or externally driven. The scale consists of 28 items measuring the following 5 sub-dimensions: Intrinsic motivation, introjected regulation, identified regulation, external regulation and amotivation. Intrinsic motivation included 12-items. The other sub-scales consisted of 4-items each. The answer

¹⁶ Originally developed in French, an English version of the scale can be downloaded from, for example: <http://ebookily.org/pdf/academic-motivation-scale-ams-c-28-college-version-45971745.html>

format used was a Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). High scores indicate a high level of motivation. An example item for the sub-scale of intrinsic motivation is, “Because I experience pleasure and satisfaction while learning new things”. An example item for the sub-scale of introjected regulation is, “To prove to myself that I am capable of completing my university degree”. Example items for the two sub-scales of identified and external regulation are: “Because I think that a university education will help me better prepare for the career I have chosen” and “Because with only a high-school degree I would not find a high-paying job later on”, respectively. An example item for the sub-scale of amotivation is, “Honestly, I don't know; I really feel that I am wasting my time in university”. Vallerand et al. (1992) reported reliability coefficients ranging from .83 to .86 for the different subscales of the AMS; except for the subscale of identified regulation which only reached an internal consistency of .62. Similarly, Petersen et al. (2009) reported alpha coefficients for the AMS scale ranging from .47 to .81 with identified regulation and intrinsic motivation reaching internal consistency of .81 and .79, respectively. Introjected regulation had a reliability of .62, while both sub-scales of external regulation (.47) and amotivation (.48) had rather unacceptable reliabilities.

3.2.2.3 Self-esteem

Students' self-esteem was measured by the Rosenberg self-esteem scale (Rosenberg, 1979, p. 291). The scale consists of ten items measuring the participant's global self-esteem. The answer format used was a Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). High scores indicate a high level of self-esteem. An example of items included in this scale is, “On the whole I am satisfied with myself”. Bornman (1999) and Rosenberg (1979) reported reliability coefficients ranging from .67 to .88 for the Rosenberg self-esteem scale.

Petersen et al. (2009) reported a Cronbach alpha value of .83 for the Rosenberg self-esteem scale with South African students.

3.2.2.4 Perceived stress

Perceived stress was assessed by using 10-items out of the 14-item scale of the *Perceived Stress Scale* (PSS) developed by Cohen, Kamarck and Mermelstein (1983, p. 394-395). The PSS was developed to assess the extent to which the respondents “found their lives unpredictable, uncontrollable, and overloading” (Cohen et al., 1983, p. 387). Scores on the PSS range from 0 (low stress) to a maximum of 4 (high stress). An example of items included in this scale is, “In the last month, how often have you been upset because of something that happened unexpectedly”. Cohen et al. (1983) reported reliability coefficients ranging from .83 to .87. Petersen et al. (2009) found a slightly lower reliability coefficient of .74 in their study with students at the University of Cape Town.

3.2.2.5 Academic overload

Academic overload was measured via the 6-item scale used by Muller and Louw (2004, p. 175) and evaluates the students’ perceptions of the fit of requirements between student and the educational environment. Students were asked to rate their responses on a 5-point Likert scale ranging from 1 (does not apply at all) to 5 (applies completely). A high score on the scale indicates a high level of academic overload, (i.e. the student is experiencing difficulties and finds university very demanding). Muller and Louw (2004) reported a reliability coefficient of .84 for the full scale, while Petersen et al. (2009) found an alpha estimate of .75. An example of items included in this scale is, “In my studies the volume of work is too high”.

3.2.2.6 *Test anxiety*

Test anxiety was assessed by a self-report measure constructed by Wrench, Richmond, and Gorhan (2009, p. 62-63) and is composed of statements students have used to describe how they feel in evaluation / examination / test-like situations. The instrument is a 20-item scale, of which 10-items were chosen to be included in present study. The answer format used was a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Like other test anxiety instruments, this measure taps the level of apprehension that students experience when they know they will be evaluated by a test. An example of items included in this scale is, "I feel tense when I am studying for a test or exam". Richmond, Wrench, and Gorhan (2001) reported a reliability coefficient of .85 for the full scale.

3.2.2.7 *Self-efficacy*

Self-efficacy was assessed by the *Academic Confidence Scale* (ACS) developed by Sander and Sanders (2003). The ACS measures individuals' confidence in their ability to perform a wide range of tasks. Sander and Sanders (2003, p. 15) believe that the ACS could be used to identify students who are coping less well with a course. The answer format used was a 5-point Likert scale ranging from 1 (not at all confident) to 5 (very confident). The ACS is a 24-item scale, of which 5-items have been chosen for the present study to form the self-efficacy variable. High scores correspond with a high level of self-efficacy. An example of items included in this scale is, "Study effectively on your own in independent / private study". Sanders and Sander (2007) reported a reliability coefficient of .88 for the full scale.

3.2.2.8 *Perceived Social Support from friends and family*

The *Perceived Social Support* (PSS) measures, designed by Procidano and Heller (1983, p. 20-22) was used to measure the extent to which individuals perceive that their

needs for support are fulfilled by friends (PSS-Fr) and by family (PSS-Fa). The PSS-Fr and PSS-Fa measures are 20-item scales, of which 5-items were selected to form the perceived social support from friends and social support from family variables, respectively. Both measures used a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). High scores on the PSS-Fr and PSS-Fa measure indicate a high level of perceived social support from friends and family members for students. Procidano and Heller (1983) reported alpha coefficients of .88 (PSS-Fr) and .90 (PSS-Fa) for the full scales with university students. Examples of items included in this scale are, “I rely on my friends for emotional support” (PSS-Fr); and “Members of my family come to me for emotional support” (PSS-Fa).

3.2.3 Adjustment as mediator variable

The *Student Adaptation to College Questionnaire* (SACQ) developed by Baker and Siryk (1989) was used to measure the quality of the students' adjustment to university. The SACQ is a 67-item self-report questionnaire assessing student adjustment to university. Participants were asked to indicate how closely each statement applies or does not apply to them on a 9-point Likert scale ranging from 1 (doesn't apply to me at all) to 9 (applies very closely to me). Higher scores indicate success in adjustment to university. The scale comprises four sub-scales: academic adjustment (24 items), social adjustment (20 items), personal-emotional adjustment (15 items), and institutional attachment (15 items). Ten items were chosen from each sub-scale for the present study. Baker and Siryk (1989) reported alpha coefficients for the full versions of the sub-scales to range from .81 to .90 for academic adjustment, from .83 to .91 for social adjustment, from .77 to .86 for personal-emotional adjustment and from .85 to .91 for institutional attachment. Similar reliability coefficients for the sub-scales of the SACQ were reported by Petersen et al. (2009). In their study with South

African undergraduate students at the University of Cape Town, the sub-scales of academic and social adjustment showed an alpha coefficient of .84; the sub-scale of personal-emotional adjustment reaching an internal consistency of .78 and the sub-scale of institutional attachment revealed an internal consistency of .86. An example of items included in the academic adjustment scale is, “I have been keeping up to date with my academic work”. An example of items included in the social adjustment scale is, “I feel that I fit in well as part of the university environment”. For personal-emotional adjustment an example is, “I have been feeling tense or nervous lately”; and for institutional attachment an example is, “I am pleased now about my decision to attend this university in particular”.

3.2.4 Academic performance as dependent variable

In line with Petersen et al. (2009) and previous research (e.g., Huysamen, 1999; Shochet, 1994), the students’ actual academic performance was used as the dependent variable of the present study. This information was accessed through the records obtained from UFH’s planning office. For each student, the record indicated the number of enrolled courses together with the obtained academic mark (in percentage) at the end of the year for each course. For every student, the obtained academic mark for each course was added together and divided by the number of enrolled courses. The average percentage that students obtained for all their courses at the end of their academic year was then used as the measure of academic performance. The time lag between assessing the independent and mediator variables and students’ academic year mark was 7-8 weeks. That is, the independent variables and mediator variable were assessed before students wrote their final exams.

3.3 Data analysis procedures

The data analysis included reliability analysis, descriptive statistics of the data, group comparison, correlation analysis and path analysis. The data analysis in the current study was conducted with the statistical package for social sciences, SPSS 18, and AMOS 18. SPSS is widely used in the social sciences and AMOS is a special add-on program from SPSS to conduct structural equation modelling (SEM) or path analysis (PA). SPSS 18 was used for descriptive statistics, reliability analysis and correlation analysis. AMOS 18 was used to conduct path analysis.

3.3.1 Reliability analysis

The first step of the data analysis was the item analysis of the independent and mediator variables to calculate the reliability of the scales and assess their psychometric properties. Reliability refers to the internal consistency of the scale (Lounsbury et al., 2006). It refers to what extent a scale is free from measurement error (Pedhazur & Schmelkin, 1991). In essence, reliability is a minimum criterion for scale validity (Lounsbury et al., 2006). Rightfully, Pedhazur and Schmelkin (1991) state that a “measure cannot be valid, if it is not reliable” (p. 81). According to Lounsbury et al. (2006), Cronbach’s alpha or alpha coefficient is the most commonly used technique in estimating internal-consistency reliability in psychological research. In the present study, the reliability of all scales was estimated using Cronbach’s alpha technique. Cronbach’s alpha for each scale was calculated by assessing the corrected inter-item total correlations for each item beforehand. That is, items which showed an inter-item correlation of less than .3 were excluded from the scale (given that their removal improved internal consistency) and from further analysis.

3.3.2 Descriptive and inferential statistics

The second step of the analysis involved the calculation of descriptive statistics for all scales in the present study. Descriptive statistics included the number of participants who took part in the survey, their age range, their gender, the race group to which they belong, their mother-tongue, what type of high school was attended and whether students lived on or off campus during the academic year. The descriptive statistics also included the calculation of means, standard deviations and range of scores (minimum and maximum) of all scales in the present study. Furthermore, one-sample t-test was used to estimate the differences between the mean and the midpoint of the scale.

3.3.2.1 *Group comparison*

Independent samples t-tests were conducted to test for possible gender differences, age differences and residence status differences amongst all independent variables, mediator variable and dependent variable. The confidence interval for t-tests was set to 95%.

3.3.3 Pearson's correlation matrix

The third step of the analysis was the calculation of the Pearson product-moment correlation matrix among all variables, which is considered to be the first main step in path analysis. The correlation matrix in the present study was calculated to determine if there were positive or negative associations between the independent, mediator and dependent variables as specified in the hypotheses. The correlation coefficient r can range from -1 to +1. Variables which did not have a significant correlation with either adjustment or academic performance were removed from further analysis. In psychology, more importance is generally given to correlation coefficients which are $\pm \geq .3$ (Dickter, 2006). It was hypothesized that there will be significant positive correlations between help-seeking,

intrinsic motivation, identified regulation, self-esteem, self-efficacy, perceived social support from friends, perceived social support from family and the mediator variable of adjustment and dependent variable of academic performance. Similarly, it was hypothesized that there will be significant negative correlations between external regulation, introjected regulation, amotivation, academic overload, perceived stress, test-anxiety and adjustment and academic performance. It was also hypothesized that there will be a significant positive correlation between adjustment and academic performance.

The next paragraphs outline and explain the different steps that were taken to test the hypotheses. In order to gain a brief overview and understanding of path analysis, the basic principles and procedure are defined.

3.3.4 Path analysis

Path analysis is a relatively complex technique which was first developed and conceptualized by Sewall Wright (Wright, 1921; 1934). Since its inception and origin, path analysis has been used across a wide range of different disciplines (i.e., economics, medicine, etc.) and has also been applied extensively in social science research, including psychology¹⁷. Path analysis is essentially a statistical technique for testing and estimating the assumed causal relationships of independent variables to dependent variables (Vaughan, 2007). A path analysis, however, does not establish causation. Accordingly, Wright (1934, p.

¹⁷ Path analysis is not used or applied extensively as often in social science research in South Africa as more traditional techniques. As such, an online literature search was conducted on the South African Thesis & Dissertation database, UNISA Electronic Theses and Dissertations (UNISA ETD), the index to South African periodicals and the African Journals archive using the keywords of path analysis and SEM. All databases combined, results indicated only eleven studies utilizing the techniques of path analysis or SEM. Six studies were found in the database of South African Thesis and Dissertations, which included five studies in the subject area of psychology and one in the subject area of education. The UNISA ETD database only listed one study in the subject area of psychology. The index to South African periodicals indicated four articles from South African journals; whereas the African Journals archive revealed no results. Internationally, SEM and path analysis is used more widely in social science research. For example, MacCallum and Austin (2000) reported that from 1993 – 1997 alone, about 500 published studies utilized the techniques of SEM - and this was only for research journals in psychology. About 25% of the studies used path models (MacCallum & Austin, 2000).

193) stated: “The method of path coefficients is not intended to accomplish the impossible task of deducing causal relations from the values of the correlation coefficients. It is intended to combine the quantitative information given by the correlations with such qualitative information as may be at hand on causal relations to give a quantitative interpretation”. As is true for other research techniques, the assumed relationships among a set of variables should ideally be based on theory or previous research findings in the scientific literature.

Path analysis can be seen as a means of showing the correlation between variables in a statistical study. Path analysis can also be understood as an extension of multiple regression analysis which allows more than one dependent variable as well as a number of paths that lead through more variables (Streiner, 2005). Path analysis normally starts with the formulation of assumptions (hypotheses) that are represented diagrammatically in the form of rectangles and arrows that indicate the possible causation. The task of path analysis is to predict the regression weights. The regression weights predicted during path analysis are then compared to the observed correlation matrix. Finally, the goodness of fit statistics are calculated to test if the model fits the data.

Path analysis was chosen as the technique for the current study for a number of reasons. In order to replicate and extend the previous research conducted by Petersen et al. (2009) it was essential to apply and follow identical research techniques. Furthermore, as the variable of adjustment in the hypothesized model acts as both, a criterion of multiple independent variables and predictor variable to academic performance (also called a mediator variable), alternative statistical techniques cannot be applied. For example, testing the mediator effect of adjustment using Sobel technique is based on a model consisting of one independent and one dependent variable. Also, path analysis was chosen instead of structural equation modelling (SEM) as the hypothesized model was not based on a latent variable structure (this distinction is described in the next paragraph).

Path analysis belongs to a family of statistical techniques known as structural equation modelling (SEM) (Hancock & Mueller, 2003; Vaughan, 2007) and is sometimes referred to as an early form of SEM (Lei, 2006). There is one major distinction that sets a path analysis apart to other forms of SEM. In a path analysis all variables are measured or observed. Other forms of SEM however, include latent variables in the model – variables which cannot be measured directly. Latent variables are also referred to as hidden or unobserved variables. A latent variable might best be understood as a hypothetical or theoretical construct that is explained or represented by a number of observed variables which can be measured (Byrne, 2001; Savalei & Bentler, 2006). In psychology an example of a latent variable is ‘intelligence’, similarly, in education, ‘reading ability or verbal ability’ are considered examples of latent variables. The following paragraphs outline the key concepts and steps that are necessary to conduct a path analysis.

3.3.4.1 Model definition in path analysis

The first step in a path analysis usually involves the drawing of a diagram which represents the independent and dependent variables of the study. Each variable in a path analysis is represented by a rectangular box. Here the model to be tested is specified and can be thought of as a graphical representation of the theory-based hypotheses. This graphical representation is called a path diagram. Path diagrams are schematic representations of models which provide a visual portrayal of relations which are assumed to be held among the variables under study (Byrne, 2001). A path diagram is defined as the “graphical equivalent of its mathematical representation whereby a set of equations relates dependent variables to their explanatory variables” (Byrne, 2001, p. 9).

Single headed arrows in a path analysis are used to indicate the assumed causation between two variables. The single headed arrows always point from the independent

variables to the dependent variables and from the mediating variables to the dependent variables. This means that a single headed arrow always points from an assumed cause to an assumed effect. For example, in the current study single headed arrows from all independent variables point towards adjustment as well as academic performance, with adjustment additionally pointing towards academic performance; which represents the assumption that the independent variables predict academic performance both directly and mediated via adjustment.

In a path analysis the independent variables (help-seeking, intrinsic motivation, identified regulation, introjected regulation, amotivation, self-esteem, academic overload, perceived stress, self-efficacy, test-anxiety, perceived social support from friends and family – in the present study) are categorized as exogenous variables. Exogenous variables are synonymous to independent variables. Exogenous variables are those variables whose causes are not explicitly represented in the model. The causes of exogenous variables are unknown and considered to be influenced by factors external to the model (Byrne, 2001). Adjustment and academic performance are termed endogenous variables. Endogenous variables are synonymous to dependent variables. The assumed causes of endogenous variables are specified in the model, that is, they are influenced either directly or indirectly by the exogenous variables. The endogenous variable of adjustment is also specified as a direct cause of the endogenous variable academic performance. As such, adjustment has a dual role, it is both a criterion and a predictor, which in path analysis is called a mediator variable. A mediator variable relates some effects of prior variables (independent variables) onto subsequent variables (dependent variables) (Kline, 2005). Important to point out here is that an endogenous variable cannot be an assumed cause of an exogenous variable.

Each single headed arrow between an exogenous and endogenous variable has a path coefficient. A path coefficient measures the direct effect of one variable on another, while at

the same time, controlling for all other variables in the path model. A path coefficient also indicates the direction and magnitude of the assumed causal relationship (Hancock & Mueller, 2003). A path analysis also uses double headed curved arrows, which are used to indicate correlations between exogenous variables. They do not, however, infer any causal relationships.

Furthermore, each endogenous variable (adjustment and academic performance) in a path analysis has a corresponding error term, also called disturbance term. These error terms represent the unexplained variance of endogenous variables. For example, there may be additional variables that affect adjustment and academic performance beyond those having been specified in the proposed path model. The learning strategies and achievement goals students have, as well as their personality characteristics and level of English language proficiency are just a few examples of other variables that might also influence how they adjust or perform academically at university.

3.3.4.2 Assumptions of path analysis

Path analysis is a statistical method and is therefore based on a number of assumptions that have to be met. The following are the assumptions that are typically applicable to a path analysis (Billings & Wroten, 1978; Garson, 2011; Olobatuyi, 2006):

1. Linearity, additivity and causality.

All relationships between exogenous and endogenous variables in a path model have to be linear (in a straight line) and their assumed causal relationships have to be indicated in the path diagram. An absence of a linear relationship between two variables indicates that there is no assumed relationship. In order to test for and ensure linearity between exogenous and endogenous variables, bivariate scatterplots were conducted with SPSS. The concept of

additivity infers that there are no significant interaction effects between variables. “If two variables interact in affecting a third variable, then causal inference based on ordinary path analysis may be incorrect” (Billings & Wroten, 1978, p. 683).

2. Measurement error.

All independent variables in a path analysis have to be measured without error to ensure that the measuring instruments are accurate. To meet this assumption, the internal consistency of all scales was calculated. The Cronbach’s alpha for all measuring instruments is reported in Chapter IV under preliminary analysis.

3. Lack of multicollinearity.

In order to conduct a path analysis a lack of multicollinearity among the independent variables has to be ensured. Multicollinearity occurs when one independent variable is perfectly correlated with another independent variable. This was tested by observing the calculated correlation matrix among independent and dependent variables – identifying possible perfect correlations between independent variables. According to the literature, multicollinearity causes a problem if there are correlations above .80 among independent variables (Jobson, 1991; Kmenta, 1986).

4. Error term.

The error term of an endogenous variable in a path analysis has to be uncorrelated with the other variables as well as with other error terms – as specified in the path model. If this assumption is violated or not adhered to the calculated path coefficients between the variables may not be accurate, that is, the estimated path coefficients might be smaller or

larger than they actually are which may result in a misinterpretation of the path coefficients in the model.

5. Recursiveness.

The assumed relationships between exogenous and endogenous variables in the path model are unidirectional. That is, for example, if test-anxiety is assumed to affect academic performance; academic performance cannot be assumed to affect test-anxiety, either directly or indirectly through another variable. The assumed relationship can only be in one direction; there is no reverse causation. This assumption has been met by specifying only unidirectional relationships in the path model.

6. Measurement level.

Path analysis, like other parametric statistics, assumes that all variables are measured on an interval scale (i.e., Billings & Wroten, 1978; Boss, Doherty, LaRossa, Schumm, & Steinmetz, 2008; Olobatuyi, 2006). A review of the path analysis literature indicates that Likert scales may be used. Here a Likert scale with at least five categories should be used, scales with seven or more categories is generally preferred. Billings and Wroten (1978) indicated that “measures employing a reasonable number of values and containing multiple items will yield data with sufficient interval properties” (p. 684). All independent variables in the current study were measured with a Likert scale of at least five categories and with multiple items.

7. Specification error.

The specification error refers to the selection of variables that should be included in a path analysis. That is, only relevant variables should be included in a path analysis, those

which are either based on theory or on previous research that may affect the dependent variable. Berry and Feldman (1985) advise that variables which have a theoretical significance should be included, while those which do not show any theoretical significance should be excluded from a path analysis. This assumption has been met by a) replicating previous research on adjustment and academic performance and b) reviewing the literature on adjustment and academic performance of students at university to decide which additional variables to include extending the original model by Petersen et al. (2009).

8. Sample size.

For the results to be significant, an adequate sample size of 5-10 cases per estimate in the path model is recommended (Sclove, 2006). The sample size considerations are explained in more detail in the next paragraph.

3.3.4.3 Sample size considerations

A very important requirement to conduct path analysis is to have an adequate sample size. In path analysis, a small sample size is usually considered to be $N < 100$ cases, a medium sample ranges between 100 – 200 cases and a large sample has $N > 200$ cases. This is considered to be a rough guideline only, as model complexity has to be considered in estimating an adequate sample size. Therefore, a model which is very complex (i.e., with many parameters) requires a larger sample size for results to be stable than a simple model (parsimonious, i.e., with less parameters). A too small sample size in path analysis indicates that the power of statistical tests may be very limited (Kline, 2005). According to Kline (2005), an adequate sample size should be 10 times the cases of parameters in path analysis (10:1). That is, for every one parameter there should be at least 10 responses / cases. An ideal sample size should be 20 times the cases of parameters in path analysis (20:1). In the

present study, the ratio of number of cases to number of parameters was 28:1 for the model comparison (Hypothesis 2) and 20:1 for the model extension (Hypothesis 3). These ratios were considered to be adequate.

3.3.4.4 Model identification

The second step in a path analysis is to determine if the proposed model is identified so that unique estimates for all variables can be calculated (Kline, 2005). The aim here is to specify a model that is overidentified. An overidentified model is one in which the number of estimable parameters is less than the number of variances and co-variances of the observed variables (Byrne, 2001). There have to be more observations than free model parameters, hence an overidentified model has degrees of freedom (df) which are > 0 . In the present study, the ‘direct and mediated’ model had $df = 17$; whereas the ‘mediated’ model as well as the ‘direct’ model each had $df = 26$ (Hypothesis 2). The extended model had $df = 47$ (Hypothesis 3).

Path models may also be classified as just-identified or underidentified. A just-identified model is one where the variances and co-variances are equal to the number of parameters specified. The $df = 0$ the model can never be rejected and is therefore not preferred in research (Byrne, 2001). An underidentified model is one in which the number of estimable parameters is more than the number of variances and co-variances. Such underidentified models “[...] contain insufficient information for the purpose of attaining a determinate solution of parameter estimation” (Byrne, 2001, p. 35).

Having established that the model is overidentified, the third step involved selecting appropriate measures (instruments) for the variables included in the path diagram and the collection and screening of data. Thereafter, the fourth step of a path analysis consisted of estimating how well the model fitted the data, by calculating the goodness of fit statistics

with the statistical program AMOS. The goodness of fit statistics are explained in more detail in the next paragraphs.

3.3.4.5 Model fit and Goodness of fit statistics

Model fitting involves the process of finding out whether a hypothesized model fits the sample data (i.e., how well does the model explain the data). This is expressed by the goodness of fit statistics. Numerous model fit indexes exist in the SEM literature and the statistical program AMOS calculates more indexes than are normally reported in psychological research. The most common reported fit indexes are: the chi-square fit index, the Normed Fit Index (NFI), the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA), which were used in the present study. It is important to keep in mind however, that just because a model fits the data, the fit indexes do not indicate if the results are theoretically meaningful (Kline, 2005).

When assessing the fit of a hypothesized model to the collected data, a chi-square index that is not statistically significant indicates a good overall fit of the model to the data. The chi-square statistic is also used when comparing nested models. The CFI and NFI are among the most widely used statistics in path analysis and evaluate the improvement in fit of the hypothesized model compared to a baseline model (Hancock & Mueller, 2003; Kline, 2005). Both the CFI and NFI range from zero to 1.00. A value which is $> .90$ originally indicated reasonably good fit for a model (Bentler, 1992). More recently, a value of $\geq .95$ has been recommended (Hu & Bentler, 1999; Lei, 2006). The RMSEA has been recognized as one of the most informative fit indexes in path analysis and measures the error of approximation in the population (Byrne, 2001; Kline, 2005). It asks the question, "How well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?" (Browne & Cudeck, 1993, pp. 137-138). A lower

RMSEA value is indicative of a better fit. Values which are $< .05$ indicate a good fit to the data, whereas values between $.05$ and $.08$ suggest reasonable error of approximation, and a RMSEA value $> .10$ indicates poor fit (Browne & Cudeck, 1993). The results of all fit indexes were then evaluated to determine if the hypothesized models displayed an acceptable fit to the data.

Model fit and path coefficients were estimated by using Maximum Likelihood (ML). In ML, estimates of all parameters in the model are calculated simultaneously (Kline, 2005). The technique of ML estimation is complex, complicated and often iterative, that is, estimates are repeatedly calculated (Kline, 2005). As described by Kline (2005), “the computer derives an initial solution and then attempts to improve these estimates through subsequent cycles of calculations” (p. 113). ML estimation is the recommended method to use as it calculates the most precise estimates for the model (Savalei & Bentler, 2006). Using a different estimation method involves explicit justification (Byrne, 2000; as cited in Kline, 2005).

3.3.4.6 Model interpretation

After adequate model fit has been ascertained by the fit indexes, the final step of path analysis was to interpret the theoretically assumed causal relationships in the model. Here, the path coefficients are evaluated. Path coefficients are “statistical estimates of direct effects” (Kline, 2005, p. 68). That is, path coefficients “control for correlations among multiple presumed causes of the same variable” (Kline, 2005, p. 68) and indicates the effects of independent variables on dependent variables. The statistical program AMOS calculates both standardized and unstandardized path coefficients. As different scales of measurement were applied in the current study (i.e., a 9-point Likert scale for the variable of adjustment, but 5-point Likert scales for the variable of academic overload and self-efficacy), it is

recommended to interpret the standardized path coefficients in order to contrast their relative effect on adjustment and academic performance (Vaughan, 2007). Similar to correlation coefficients, path coefficients range from -1 to +1, with higher values reflecting a stronger relationship between two variables. For example, a path coefficient of +.35 from motivation to academic performance would indicate that an increase in motivation is assumed to directly cause an increase in academic performance. That is, a 1-unit increase in scores on the motivation scale results in a .35 unit increase in scores on the academic performance scale.

3.3.4.7 Model comparisons (nested models approach)

The hypothesis (H2.1) in the present study stated that the partially mediated model will predict more of the variance in students' adjustment and academic performance at university than either the direct model or mediated model. Furthermore, hypothesis (H3.1) stated that the extended model, with the added paths of self-efficacy, test-anxiety, perceived social support from friends and perceived social support from family, will explain more of the variance in students' adjustment and academic performance at university than the original model proposed by Petersen et al. (2009). In order to test both of these hypotheses, it was necessary to conduct nested model comparisons to establish which model (direct, indirect, and partially mediated) explained more of the variance in students' adjustment and academic performance to university and whether the model extension increases the explained variance significantly.

Path models are considered to be nested (hierarchical) if they represent subsets of each other (Kline, 2005). This may be best explained by considering the illustrative example of Figure 3 and Figure 4 below. For example, if the paths of test-anxiety and self-efficacy of Model A (Figure 3) are dropped to form Model B (Figure 4), the two models are nested;

Model B (Figure 4) is nested under Model A (Figure 3). All parameters are freely estimated in Model A, but particular parameters in Model B are fixed to zero.

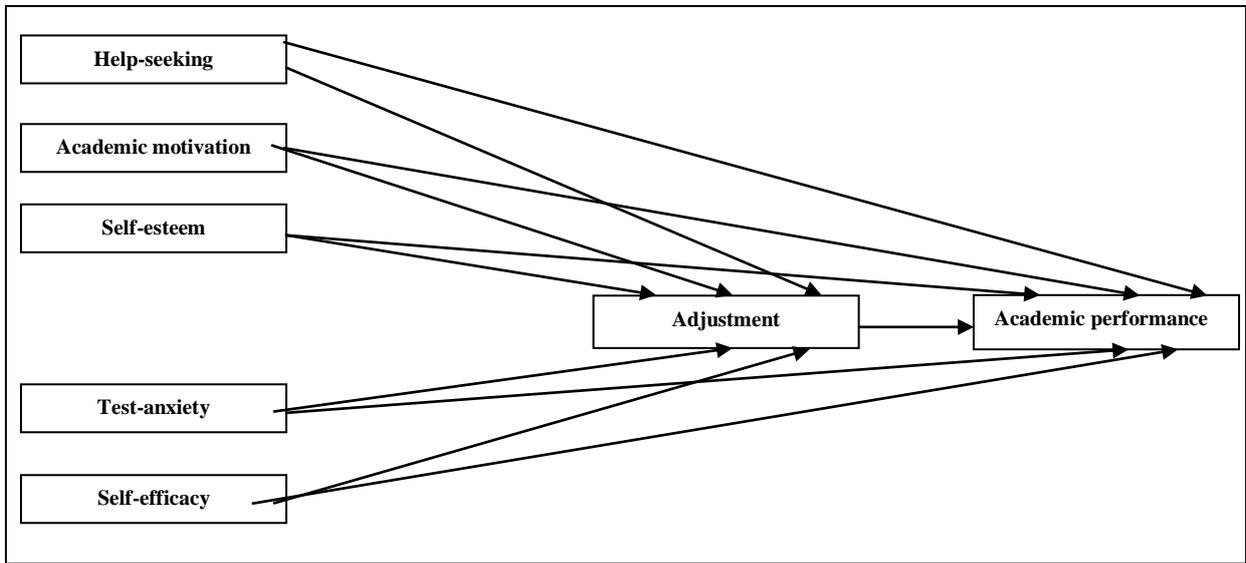


Figure 3. Model A

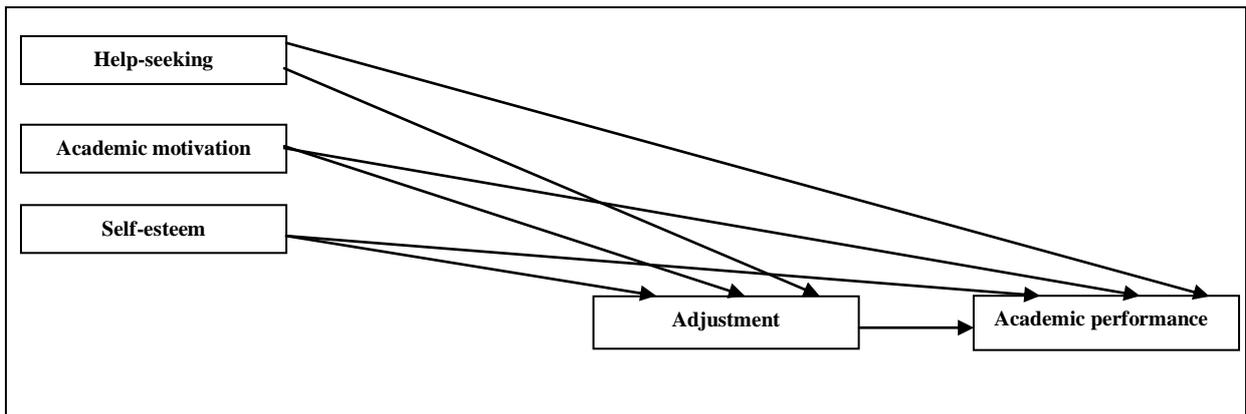


Figure 4. Model B

Thus, the nested models approach was used to conduct the “Model Comparison” (Hypotheses 2), as well as for the “Model Extension” (Hypothesis 3). For the Model Comparison, three different models were tested and calculated: a direct and mediated model (Model 1), a direct model (Model 2), and a mediated model (Model 3). All parameters were freely estimated for Model 1. For Model 2, all indirect paths (all paths to adjustment) were constrained to equal zero. Adjustment here was not a mediator variable, but acted as another exogenous variable. Similarly, for Model 3, all direct paths (all paths to academic

performance, except for adjustment) were constrained to equal zero. Both Model 2 and 3 were nested under Model 1.

The Model Comparison was in essence a replication study of Petersen et al. (2009) to determine if the findings and results were similar among another sample of university students from another university. Model replication is relatively rare in SEM, that is, models are seldom estimated across independent samples. Kline (2005) however stated that: “It is critical to eventually replicate a structural equation model if it is ever to represent anything beyond a mere statistical exercise” (p. 65).

The Model Extension, on the other hand, compared only two models. Model 1 from the Model Comparison (Hypothesis 2) was compared to an extended model (Model 4) – with the added paths of test-anxiety, self-efficacy, perceived social support from friends and perceived social support from family. Here, the added paths were constrained to equal zero for Model 1. Hence, Model 1 was nested under Model 4.

The chi-square difference statistic was then calculated with AMOS comparing the nested model(s) to the baseline model for the “Model Comparison” and “Model Extension”. According to Kline (2005), the chi-square difference statistic is “used to test the statistical significance of the decrement in overall fit as paths are eliminated or the improvement in fit as paths are added” (p. 146). A nested model is considered to be different from the baseline model if its chi-square value is statistically significant (AMOS FAQ #6: Nested Model Comparisons, 2011). If a significant difference between a nested model and baseline model is found, it indicates, that the elimination of paths from the baseline model to obtain nested model(s) (more parsimonious models), results in a worsening of the overall fit of the baseline model to the sample data (AMOS FAQ #6: Nested Model Comparisons, 2011). Hence, the parsimony reached by the elimination of paths from the baseline model comes at

too high a cost; and it is recommended to keep the baseline model and reject the nested (i.e., the more parsimonious) model (AMOS FAQ #6: Nested Model Comparisons, 2011).

3.3.4.8 Test for moderators

The fourth hypothesis in the present study stated that the factors of gender, age and students' residence status moderate the psychosocial variables in predicting adjustment and academic performance at university. The extended model to predict adjustment and academic performance of students at university was therefore further evaluated across three different moderators. Specifically, the model was tested across group difference for a) gender, b) age and c) whether students reside on or off campus during the academic year, to determine if the path coefficients vary across groups.

The test for moderators followed the procedure as outlined by Byrne (2004). The first step in testing for invariance across moderator variables in path analysis involved the calculation of the baseline model and model fit statistics (Byrne, 2004, p. 274). The baseline model is also referred to as the unconstrained model. That is, the extended model was calculated for the entire sample. Byrne (2004, p. 279) states that this is necessary because it “[...] provides the baseline value against which subsequent tests for invariance may be compared”. The second step to test for possible group differences in the extended path model involved setting cross-group equality constraints on all path estimates. That is, all indirect and direct paths of the exogenous variables to adjustment and academic performance in the path model were constrained to be equal across groups (i.e., the paths will not be different for females or males). This involved labelling all paths included in the group comparison. Hence, this model is referred to as the constrained model.

This is illustrated by considering the gender group comparison as an example. The procedure was identical for the other two group comparisons. All paths for the female group

were labelled from a1 to a13 and all paths for the male group were labelled from b1 to b13. For example, the path of help-seeking to adjustment was labelled a1 for the female group and b1 for the male group. Similarly, the path of intrinsic motivation to adjustment was labelled a2 for the female group and b2 for the male group. All individual paths are then set to be equal across the groups (e.g., for the path help-seeking to adjustment, $a1=b1$; for the path intrinsic motivation to adjustment, $a2=b2$; etc.). After setting all cross-group equality constraints, the model(s) was calculated.

The next step in testing for invariance was to examine and compare the model fit statistics of the unconstrained and constrained model. If the goodness of fit statistics for the constrained model is worse than those for the unconstrained model, it was concluded that there are differences among the groups (Kline, 2005; Pettey, n.d.). Byrne (2004) states that the invariance of a constrained model may be tested by calculating a chi-square difference value with the unconstrained model – with a significant result ($p < .05$) indicating that “[...] some equality constraints do not hold across ... groups” (p. 283). The last step then is to determine which path coefficients differ significantly among groups. Here a chi-square statistic was calculated by AMOS for each equality constraint path, which is utilized to test for significant differences among the paths. A significant chi-square statistic at the .05 significance level is then indicative of group differences.

Chapter IV: Results

Chapter IV outlines the results of the study. The demographic details and descriptive statistics of participants are presented first. This is followed by the reliability analysis of the independent measures and one sample t-tests. Thereafter, the correlation analysis and Pearson correlation matrix is presented, testing hypothesis H1.1 – H1.3. Then, group differences (age, gender and residence status) for all independent variables, mediating variable and dependent variable are presented. The remaining part of Chapter IV is utilized for hypotheses testing through path analysis. This involved the Model Comparison, testing hypothesis H2.1 – H2.4 and the Model Extension, testing hypothesis H3.1 – H3.3. The final step was to test whether the factors of gender (H4a1 – H4a6), age (H4b1 – H4b4) and students' residence status (H4c1 and H4c3) moderated the psychosocial variables in predicting adjustment and academic performance at university.

4.1 Preliminary analysis

4.1.1 Participants

The demographic characteristics of the 280 participants are summarized in Table 7. The age of participants ranged from 17-39 with a mean age of 21 years. More males 154 (55%) than females 126 (45%) participated in the present study. In total, 164 (58.6%) first year students and 116 (41.4%) second year students took part in the study. The majority of participants were registered in the Faculty of Management and Commerce (38.3%), followed by the Faculty of Social Science and Humanities (27.4%) and the Faculty of Science and Agriculture (19.7%). The remaining participants were registered in the Faculty of Law (8.0%) and the Faculty of Education (6.6%). The majority of students lived on-campus in a university residence 192 (68.6%) compared to 88 (31.4%) students who resided off-campus in private accommodation. The majority of the participants were black 270 (96.4%) and their

first language is Xhosa 195 (69.6%) – which was expected with a predominantly black student population at UFH. The majority of the participants attended a government high school 225 (80.4%) prior to attending university. This result was also expected as the university relies largely on black Eastern Cape matriculants (see Santed, 2009) who come from resource-poor environments.

Table 7

Demographic Characteristics of Participants

	n	%
<u>Gender</u>		
Male	154	55
Female	126	45
<u>Race</u>		
Black	270	96.4
Coloured	2	0.7
Indian	2	0.7
White	6	2.1
<u>Language</u>		
Xhosa	195	69.6
Shona	30	10.7
English	21	7.5
Ndebele	14	5.0
Sesotho	5	1.8
Zulu	4	1.4
<u>High School</u>		
Government	225	80.4
Private	46	16.4
Mission	6	2.1
Government & Private	2	0.7
<u>Year of study</u>		
1 st year	164	58.6
2 nd year	116	41.4
<u>Living during academic year</u>		
On campus, university residence	192	68.6
Off campus, private accommodation	88	31.4

The chi-square statistic revealed that there was no statistical significant relationship between a students' residence status (students living on or off campus) and gender with $\chi^2(1)$

= 1.42, $p = .234$. Furthermore, no statistical significant relationships were found between a student's year of study (1st or 2nd year) and gender; or between younger (18-21 years of age) or older (21 years and above) students and residence status with $\chi^2(1) = 2.29, p = .131$ and $\chi^2(1) = 1.19, p = .275$, respectively. In order to test if males and females differed in terms of age, an independent t-test was calculated which indicated only a marginal significant difference between the mean age for males ($M = 21.62, SD = 2.68$) and females ($M = 20.93, SD = 3.40$), $t(277) = 1.90, p = .058$. There was no significant statistical difference between the mean age of students living on campus ($M = 21.41, SD = 3.04$) compared to students living off campus ($M = 21.08, SD = 3.05$), $t(277) = 0.85, p = .395$. As expected, there was a statistical significant difference between the mean age for first year students ($M = 20.66, SD = 2.75$) and second year students ($M = 22.22, SD = 3.20$), $t(277) = -4.38, p < .001$.

4.1.2 Reliability analysis

The reliability analysis of all independent measures was conducted as follow: an item was removed from the scale and from further analysis if it had an inter-item total correlation below .3 and if the value of Cronbach's Alpha increased significantly. Items which did not significantly improve the reliability of the scale, although displaying an inter-item correlation below .3, were retained for further analysis.

4.1.2.1 Help seeking

Item analysis was conducted for the help seeking scale and no items were excluded from the 4-item scale and from further analysis. All items in the help seeking scale showed an inter-item total correlation $> .3$. The detailed results of the item analysis for the help seeking scale are provided in Annexure C. In the present study a reliability of $\alpha = .71$ was obtained which is similar to the reliability of .74 for the 6-item scale reported by Karabenick and

Knapp (1991). A one sample t-test was conducted to compare the mean of the scale to the midpoint of the scale (i.e., 3.5). Results indicated that participants scored significantly higher than the midpoint of the scale ($M = 4.45$, $SD = 1.03$), $t(279) = 15.41$, $p < .001$. This indicates that participants generally displayed positive attitudes towards help seeking in the academic environment.

4.1.2.2 Academic motivation

Item analysis was carried out for all sub-scales (intrinsic motivation, introjected regulation, identified regulation, external regulation and amotivation) of the academic motivation scale. All sub-scales displayed items with an inter-item total correlation larger than .3 and no items were removed. The detailed results of the item analysis for the academic motivation scale are depicted in Annexure C. Cronbach's Alpha estimate for the sub-scale of intrinsic motivation was .87 and introjected regulation revealed a Cronbach's Alpha of .78. The results obtained for intrinsic motivation is similar to those reported by Vallerand et al. (1992) and Petersen et al. (2009); whereas the results for introjected regulation are in line with Vallerand et al. (1992). Identified regulation ($\alpha = .57$) and external regulation ($\alpha = .63$) showed rather unsatisfied reliability coefficients. As the internal consistency of these two sub-scales is rather low, results were interpreted with caution, especially for the sub-scale of identified regulation. However, all items of these two scales showed an inter-item total correlation larger than .3. The item analysis of the sub-scale amotivation revealed a Cronbach's Alpha of only .67. However all four items of the scale displayed an inter-item total correlation larger than .4. The rather low reliabilities obtained for these three sub-scales may be due to each scale consisting of only 4 items. Low reliabilities for the sub-scales of external regulation and amotivation were also found by Petersen et al. (2009).

One sample t-tests were calculated for each sub-scale, comparing the mean of the

scale to the midpoint of each scale (the midpoint for each scale is 4). Results showed that participants exhibited levels of intrinsic motivation ($M = 5.01$, $SD = 1.01$), $t(279) = 16.70$, $p < .001$) that were significantly higher than the midpoint of the scale. Participants also exhibited levels of identified regulation ($M = 6.19$, $SD = 0.76$), $t(279) = 48.11$, $p < .001$, introjected regulation ($M = 5.06$, $SD = 1.46$), $t(279) = 12.12$, $p < .001$ and external regulation ($M = 5.63$, $SD = 1.10$), $t(279) = 24.83$, $p < .001$, that were significantly higher than the midpoint of the scale. The mean of the sub-scale amotivation was significantly lower than the midpoint of the scale ($M = 1.27$, $SD = 0.67$), $t(279) = -68.32$, $p < .001$. This implies that participants are motivated by intrinsic as well as extrinsic reasons to achieve at university. Furthermore, participants demonstrated very low level of amotivation.

4.1.2.3 Self-esteem

The inter-item total correlation of the Rosenberg self-esteem scale identified 4 items as poor (i.e., with inter-item total correlations below $< .3$). The items “I feel that I’m a person of worth, at least on an equal plane with others” and “I wish I could have more respect for myself” were thus omitted from the scale and from further analysis. The items “I feel that I have a number of good qualities” and “I am able to do things as well as most other people” were retained as their removal from the scale did not result in any significant improvement in the overall value of Cronbach’s Alpha. The detailed results of the item analysis for the self-esteem scale are provided in Annexure C. The remaining 6-items all showed an inter-item total correlation larger than $.3$ but the self-esteem scale reached a rather unsatisfactory internal consistency of $.63$. The reliability of the Rosenberg self-esteem scale for the present study was lower than the results reported by previous research (e.g. Bornman, 1999; Petersen et al., 2009; Rosenberg, 1979). The one sample t-test was conducted comparing the mean of the scale to the midpoint of the scale (i.e., 3.5). The results indicated levels of self-esteem that

were significantly higher than the midpoint of the scale ($M = 4.23$, $SD = 0.53$), $t(279) = 23.08$, $p < .001$, implying that participants displayed moderately high levels of self-esteem.

4.1.2.4 Perceived stress

Item analysis conducted for the perceived stress scale identified the item “In the last month, how often have you dealt successfully with day to day problems and annoyances?” as poor ($< .3$). The item was thus excluded from the scale and from further analysis. The detailed results of the item analysis for the perceived stress scale are reported in Annexure C. The remaining 9-items all showed an inter-item total correlation larger than .3 and an alpha coefficient of .78 was found which is similar to the reliability of .74 reported by Petersen et al. (2009). The one sample t-test was conducted comparing the mean of the scale to the midpoint of the scale (i.e. 2). The results showed levels of stress that are significantly lower than the midpoint (i.e. 2) of the scale ($M = 1.83$, $SD = 0.65$), $t(279) = -4.26$, $p < .001$, implying that participants experienced moderately low levels of stress.

4.1.2.5 Academic overload

The inter-item total correlation of the academic overload scale identified two items as poor ($< .3$). The items “I have the feeling that the courses ask too little of me” and “I want to change my major” were thus omitted from the scale and from further analysis. The detailed results of the item analysis for the academic overload scale are reported in Annexure C. The remaining 4-items reached an internal consistency of .72 and all displayed an inter-item total correlation larger than .4. The reliability of the academic overload scale is similar to the result by Petersen et al. (2009) who reported an alpha coefficient of .75. The one sample t-test revealed that participants displayed levels of academic overload that are similar to the midpoint (i.e., 3) of the scale ($M = 3.01$, $SD = 0.75$), $t(279) = .159$, $p > .05$. This implies that

participants perceived their academic workload at university as moderately demanding.

4.1.2.6 Test anxiety

The inter-item total correlation of the test anxiety scale identified the item “I feel apprehensive while preparing for a test” as poor ($< .3$) which was thus excluded from further analysis (see Annexure C). The alpha reliability estimate for the remaining 9-items of this scale was .79. All items revealed an inter-item total correlation larger than .3, except for item “I feel satisfied when my exam is completed” which displayed an inter-item total correlation of .234. It was decided to retain this item in the scale, since the removal of the item did not result in a significant increase in the value of Cronbach’s Alpha. The reliability of the test anxiety scale was slightly lower than the reliability of .85 reported by Richmond et al. (2001). The one sample t-test showed levels of test anxiety that were significantly lower than the midpoint (i.e. 3.5) of the scale ($M = 2.73$, $SD = 0.74$), $t(279) = -17.53$, $p < .001$, implying that participants reported moderately low levels of test anxiety.

4.1.2.7 Self-efficacy

Item analysis was conducted for the self-efficacy scale and identified the item “How confident are you that you will be able to study effectively on your own in independent / private study” as poor ($< .3$). However, the removal of this item did not result in a significantly higher value of Cronbach’s Alpha and it was thus retained for analysis. All other items showed an inter-item total correlation higher than .4. The detailed results of the item analysis for the self-efficacy scale are depicted in Annexure C. The 5-item scale reached an internal consistency of .74 which is lower than the reliability of .88 reported by Sanders and Sander (2007). The reported reliability by Sanders and Sander (2007), however, is based on their full 24-item scale. The one sample t-test revealed that levels of self-efficacy were

significantly higher than the midpoint (i.e., 3 of the scale ($M = 4.05$, $SD = 0.60$), $t(279) = 29.24$, $p < .001$, implying that participants reported high levels of self-efficacy.

4.1.2.8 Perceived Social Support from friends and family

Item analysis was conducted for the perceived social support from friends scale (Pss-Fr) and for the perceived social support from family scale (Pss-Fa). All items from the Pss-Fr scale, as well as all items from the Pss-Fa scale, revealed an inter-item total correlation larger than .5. As a result, no items were removed from the two scales and from further analysis. The results of the item analysis for the Pss-Fr and Pss-Fa scales are reported in Annexure C. Cronbach's Alpha estimate for the Pss-Fr and Pss-Fa scale is .80 and .86, respectively. These results are similar, but slightly lower than the alpha coefficients of .88 (Pss-Fr) and .90 (Pss-Fa) reported by Procidano and Heller (1983) for the full scales with university students. Participants reported levels of perceived social support from friends ($M = 4.31$, $SD = 1.00$), $t(279) = 13.45$, $p < .001$ and perceived social support from family ($M = 4.68$, $SD = 1.09$), $t(279) = 18.21$, $p < .001$ that are significantly higher than the midpoint (i.e., 3.5) of the scales. This implies that participants perceive receiving a high amount of social support from both their friends and families.

4.1.2.9 Adjustment

Item analysis is carried out for all sub-scales (academic adjustment, social adjustment, personal and emotional adjustment and institutional attachment) of the Student Adjustment to College Questionnaire (SACQ). The results of the item analysis for all sub-scales are reported in detail in Annexure C. The inter-item total correlation of the academic adjustment sub-scale identified three items below .3 (see Annexure C). However, the removal of these three items did not result in a significantly higher Cronbach's Alpha value and they were therefore

retained for analysis. All other items showed an inter-item total correlation larger than .3. The alpha reliability estimate for academic adjustment was .73, which was lower than the reliabilities that are reported by Petersen et al. (2009) and Baker and Siryk (1989) for the full academic adjustment sub-scale. The inter-item total correlation of the social adjustment scale identified two items as poor ($< .3$), which were therefore excluded from further analysis (see Annexure C). The remaining 8-item scale reached an internal consistency of .68 which is lower than previous research (i.e., Petersen et al., 2009, Baker & Siryk, 1989). The sub-scale of personal and emotional adjustment displayed inter-item total correlations of items that were all above .4 and no items were removed from the scale and from further analysis. The Cronbach's Alpha value of .83 for this sub-scale is in line with previous research. For example, Baker and Siryk (1989) reported alpha coefficients ranging from .77 to .86; and Petersen et al. (2009) reported an alpha coefficient of .78. Finally, the sub-scale of institutional attachment showed an acceptable alpha coefficient of .73. Although one item (.264) had an inter-item total correlation below .3 (see Annexure C), the item was not excluded as no significant improvement in Cronbach's Alpha value was recorded when removing the item from the scale. The internal consistency of the institutional attachment sub-scale is somewhat lower than in previous research (Baker & Siryk, 1989; Petersen et al., 2009).

One sample t-tests were conducted for all sub-scales of the SACQ, comparing the mean of the scale to the midpoint of each scale (the midpoint for each scale is 5). The results indicate that participants scored above average on all sub-scales of the SACQ since the means of all sub-scales were significantly higher than the midpoint of the scale: academic adjustment ($M = 6.55$, $SD = 1.19$), $t(279) = 21.75$, $p < .001$, social adjustment ($M = 6.26$, $SD = 1.12$), $t(279) = 18.83$, $p < .001$, personal and emotional adjustment ($M = 6.05$, $SD = 1.60$), $t(279) = 11.02$, $p < .001$, and institutional attachment ($M = 7.25$, $SD = 1.14$), $t(279) = 32.87$, p

< .001. This implies that on average, participants displayed a good level of academic, social, personal and emotional adjustment to university. The relatively high overall mean of institutional attachment further implies that students are satisfied with attending the University of Fort Hare.

Table 8 summarizes and compares the reliability of all measuring instruments used in the present study with students from the University of Fort Hare with the study conducted by Petersen et al. (2009) with students from the University of Cape Town. As indicated, the reliabilities of the SACQ sub-scales are higher in the Petersen study, except for the sub-scale of personal and emotional adjustment which is slightly higher in the present study. Similar results were obtained for the scales of perceived stress and academic overload. The scale of self-esteem and one sub-scale of AMS (identified regulation) displayed higher reliabilities in the UCT study. The remaining scales recorded higher reliabilities in the present study.

There are a number of factors which might explain the differences in scale reliability between the two studies. Although the target group of students was similar (mainly black undergraduates, historically disadvantaged students, a mean age of 19 [UCT] and 21 [UFH], and an almost identical ratio of female to male students); there remain certain differences which set the two studies apart. For instance, UCT is an urban university, whereas UFH has an urban and a larger rural campus. The two studies were administered at different time points, in the beginning of the academic year (UCT) and shortly before final examinations (UFH). The present study was administered electronically, whereas the Petersen et al. (2009) study was administered at a central venue. Also, as mentioned in the method chapter, some scales in the present study were considerably shortened because of time constraints and overall length of the questionnaire. These differences as well as other random errors may have contributed towards difference in scale reliability. It may however also indicate that for some scales (e.g., identified regulation) the items in the measure may not all hang together or

measure the same intended construct (Wegener & Fabigar, 2004).

Table 8

Reliability of Measuring Instruments with Participants from UFH and UCT

Variables	Present study	Petersen et al. 2009
	UFH undergraduate students	UCT undergraduate students
Help seeking	.71	-.16
Intrinsic motivation	.87	.79
Introjected regulation	.78	.62
Identified regulation	.57	.81
External regulation	.63	.47
Amotivation	.67	.48
Self-esteem	.63	.83
Perceived stress	.78	.74
Academic overload	.72	.75
Test anxiety	.79	-.18
Self-efficacy	.74	-.16
Perceived social support friends	.80	-.16
Perceived social support family	.86	-.16
Academic adjustment	.73	.84
Social adjustment	.68	.84
Pers. & Emotional adjustment	.83	.78
Institutional adjustment	.73	.86

4.2. Hypotheses testing

4.2.1 Correlation analysis

The Pearson product-moment correlation matrix among all independent variables (help seeking, intrinsic motivation, introjected regulation, identified regulation, external regulation, amotivation, self-esteem, perceived stress, academic overload, test anxiety, self-efficacy, perceived social support from friends, perceived social support from family), mediating variables (academic adjustment, social adjustment, personal and emotional adjustment, institutional attachment), and dependent variable (academic performance) was calculated. The results of the correlation analysis are summarized in Table 9. As

¹⁸Note: The variables of test anxiety, self-efficacy and perceived social support were not used by Petersen et al. (2009). The variable of help-seeking was assessed differently by Petersen et al. (2009).

hypothesized, the variables of help seeking, self-esteem and self-efficacy correlate positively with all adjustment variables and academic performance. In contrast to the hypothesized relationships, the variable of intrinsic motivation was only positively correlated with the adjustment variables, but not with academic performance. The variables of identified regulation and perceived social support from friends only displayed significant positive correlations with some adjustment variables, but not with academic performance. Identified regulation showed a significant positive correlation with attachment, marginal significant relationships with social adjustment ($r = .106; p < .10$) and personal/emotional adjustment ($r = .108; p < .10$), but not with academic adjustment ($r = .096; p > .05$). Perceived social support from friends displayed significant positive correlations with academic adjustment, social adjustment and attachment but not with personal/emotional adjustment ($r = .003; p > .05$). The correlations between intrinsic motivation and academic performance ($r = -.017; p > .05$), identified regulation and academic performance ($r = .010; p > .05$), as well as between perceived social support from friends and academic performance ($r = .024; p > .05$), were not statistically significant. Furthermore, there was no significant positive correlation between perceived social support from family and academic adjustment ($r = .063; p > .05$), perceived social support from family and social adjustment ($r = .019; p > .1$), perceived social support from family and personal and emotional adjustment ($r = .020; p > .05$), perceived social support from family and institutional attachment ($r = .052; p > .05$); and between perceived social support from family and academic performance ($r = .059; p > .05$), as hypothesized. Therefore hypothesis H1.1, which stated that the independent variables of help-seeking, intrinsic motivation, self-esteem, self-efficacy, perceived social support from friends and perceived social support from family members will have a positive relationship with adjustment and academic performance, was only partially confirmed.

The variables of perceived stress and test anxiety correlated negatively with all adjustment variables and academic performance which confirmed the hypothesized relationships. Furthermore, the variables of amotivation and academic overload correlated negatively with some adjustment variables and with academic performance. That is, amotivation correlated negatively with personal/emotional adjustment, but not with academic adjustment ($r = -.047; p > .05$), social adjustment ($r = -.008; p > .05$) and attachment ($r = .018; p > .05$); while academic overload correlated negatively with academic adjustment and personal/emotional adjustment, but not with social adjustment ($r = -.063; p > .05$) and attachment ($r = -.006; p > .05$). Although the variables of external regulation¹⁹ and introjected regulation displayed significant correlations with academic adjustment and attachment, the results were in the opposite direction. External regulation and introjected regulation both showed positive associations with academic adjustment and attachment as opposed to the negative hypothesized relationships. Furthermore, there was no significant negative correlation between external regulation and academic performance ($r = .028; p > .05$); and between introjected regulation and academic performance ($r = -.030; p > .05$), as hypothesized. Hypothesis H1.2, which stated that the independent variables of extrinsic motivation, amotivation, perceived stress, academic overload and test-anxiety will have a negative association with adjustment and academic performance, was consequently, only partially confirmed.

As hypothesized, the results of the correlation analysis revealed significant positive relationships between the four adjustment variables and academic performance: academic adjustment ($r = .370; p < .001$), social adjustment ($r = .174; p < .01$), personal and emotional adjustment ($r = .346; p < .001$), and institutional attachment ($r = .124; p < .05$). Hence,

¹⁹ The positive correlation between external regulation and academic adjustment was marginally significant ($r = .108; p < .10$).

hypothesis H1.3 was confirmed. In summary, results of the correlation analysis partially confirmed the hypothesized relationships between the psychosocial variables and adjustment and academic performance (H1.1 and H1.2) and confirmed the hypothesized relationship between adjustment and academic performance (H1.3).

The results of the Pearson product-moment correlation did not replicate the additional finding of Petersen et al. (2009) as well as the findings of Taylor and Pastor (2007) who identified a lack of fit between the SACQ and the four-factor model: that both social adjustment and institutional attachment, two sub-scales of the mediator variable adjustment, are not correlated with the dependent variable of academic performance. In the present study, both social adjustment and institutional attachment were correlated with academic performance (see Table 9). It was therefore decided not to remove social adjustment and institutional attachment from the mediator variable of adjustment or from further analysis.

Table 9
Means, Standard Deviations and Inter Correlations among Principal Variables

	1	2	3	4	5	6	7	8	9	10
M	4.45	5.01	5.63	6.19	5.06	1.27	4.23	1.77	3.01	6.55
SD	1.03	1.01	1.10	0.76	1.46	0.67	0.53	0.60	0.75	1.19
Min	1.25	1.92	2	3.5	1	1	2.38	.2	1	2.5
Max	6	7	7	7	7	7	5	3.5	5	8.7
1 Help seeking	-									
2 Intrinsic Motivation	.006	-								
3 External regulation	-.010	.358***	-							
4 Identified regulation	.079	.435***	.394***	-						
5 Introjected regulation	-.064	.539***	.520***	.359***	-					
6 Amotivation	-.113†	.149*	.120*	-.045	.196**	-				
7 Self-Esteem	.116†	.169**	.050	.120*	.087	-.130*	-			
8 Stress	-.124*	-.058	-.015	-.083	.009	.143*	-.265***	-		
9 Overload	-.141*	.036	-.032	.029	.076	.098	-.134*	.103†	-	
10 Academic adjustment	.151*	.212***	.108†	.096	.153*	-.047	.242***	-.347***	-.166**	-
11 Social adjustment	.252***	.218***	.092	.106†	.081	-.008	.232***	-.224***	-.063	.454***
12 Per. & Emo. adjustment	.263***	.143*	.086	.108†	.010	-.122*	.182**	-.403***	-.183**	.624***
13 Attachment	.216***	.287***	.121*	.147*	.206**	.018	.292***	-.189**	-.006	.543***
14 Test-anxiety	-.267***	-.105†	.034	-.055	.020	.081	-.258***	.279***	.077	-.279***
15 Self-efficacy	.070	.133*	.103†	.151*	.103†	-.059	.235***	-.178**	-.033	.232***
16 PSS friends	.079	.080	.077	-.086	.067	.054	.053	.010	.006	.119*
17 PSS family	-.002	.043	.033	.019	.012	-.069	.130*	-.119*	.014	.063
18 Academic Performance	.105†	-.017	.028	.010	-.030	-.259***	.190**	-.300***	-.383***	.370***

Note. † < .10; *p < .05; **p < .01; ***p < .001

Table 9 continued

	11	12	13	14	15	16	17	18
M	6.26	6.05	7.25	2.72	4.05	4.31	4.68	63.66
SD	1.12	1.59	1.14	0.74	0.60	1.00	1.09	10.28
Min	3	1.2	3.4	1	2.4	1	1	26
Max	8.8	9	9	4.9	5	6	6	89
1 Help seeking								
2 Intrinsic Motivation								
3 External regulation								
4 Identified regulation								
5 Introjected regulation								
6 Amotivation								
7 Self-Esteem								
8 Stress								
9 Overload								
10 Academic adjustment								
11 Social adjustment	-							
12 Per. & Emo. adjustment	.558***	-						
13 Attachment	.598***	.361***	-					
14 Test-anxiety	-.251***	-.360***	-.271***	-				
15 Self-efficacy	.179**	.131*	.208***	-.173**	-			
16 PSS friends	.245***	.003	.182**	-.095	.157**	-		
17 PSS family	.019	.020	.052	-.088	.061	.240***	-	
18 Academic Performance	.174**	.346***	.124*	-.299***	.229***	.024	.059	-

Note. † < .10; *p < .05; **p < .01; ***p < .001

4.2.2 Model comparison

The second aim of the study is to replicate the findings of Peterson et al. (2009) that the partially mediated model (Figure 5) exceeds the alternative models that assume total mediation of the psychosocial factors on academic performance via adjustment and only direct effects between psychosocial factors, adjustment and academic performance, respectively. It was hypothesized (H2.1) that the partially mediated model explains more of the variance in adjustment and academic performance than the direct model (Figure 6) or mediated model (Figure 7).

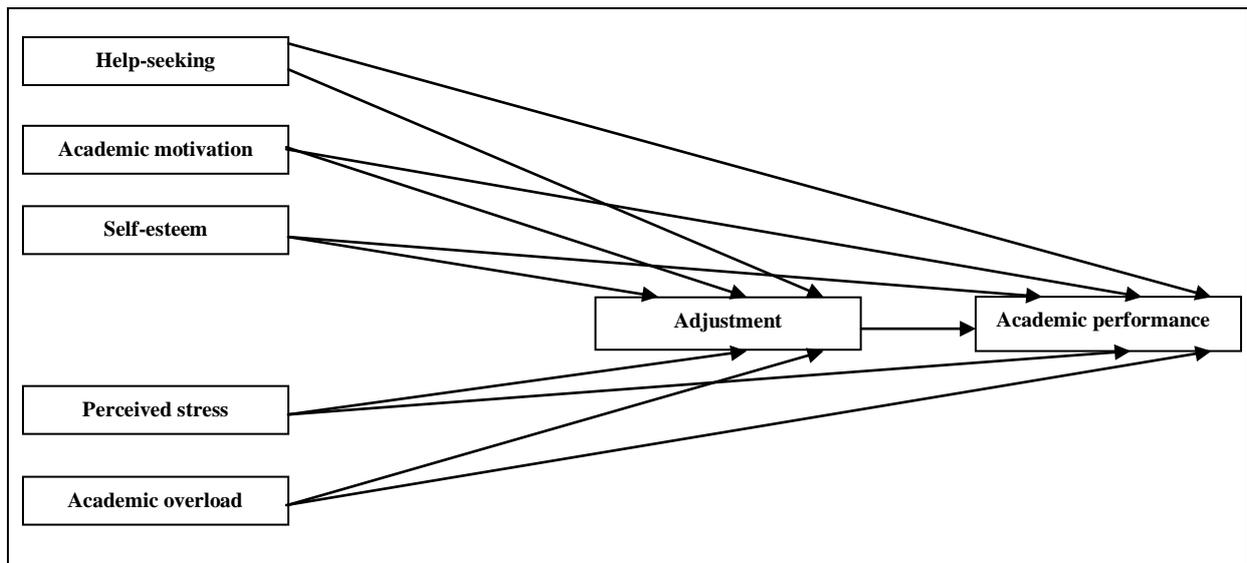


Figure 5. Direct and Mediated Model

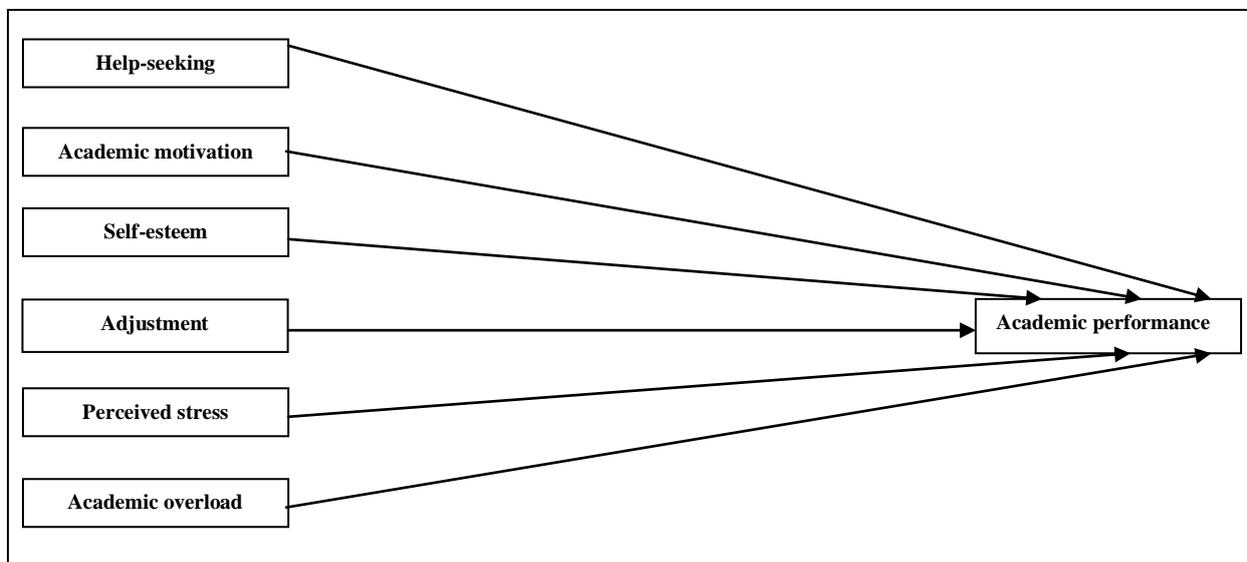


Figure 6. Direct Model

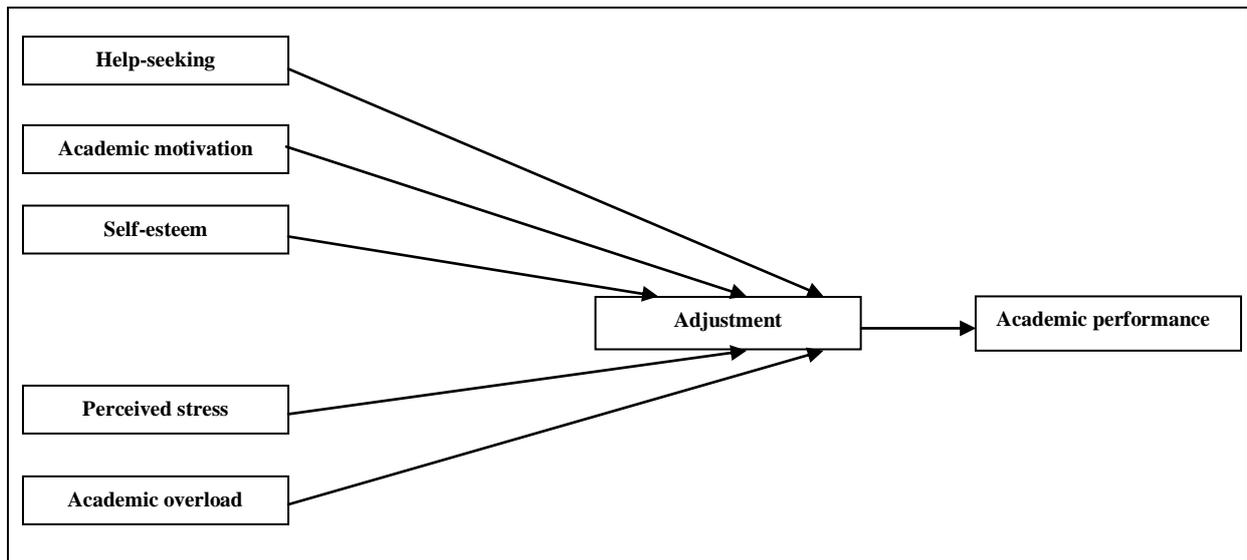


Figure 7. Mediated Model

In order to establish whether the partially mediated model explains more of the variance in adjustment and academic performance (H2.1), three different path models were tested. Model 1 (Figure 5) tested the direct and indirect effects of all independent variables on academic performance via adjustment. Model 2 (Figure 6) tested the direct effects of all independent variables on academic performance. Here, adjustment did not function as a mediator but as an independent variable. Model 3 tested the effects of the independent variables on academic performance which are assumed to be totally mediated via adjustment (see Figure 7).

The assumptions to conduct path analysis, as outlined in the method section, were adhered to and tested for the model comparison and for the model extension. First of all, the path models (see Figure 5 – 7) were specified and based on previous research and theory-based hypotheses thought to influence academic performance in order to avoid a specification error. As illustrated in Figure 5 to 7, the relationships between exogenous and endogenous variables are unidirectional and linear; always pointing from an assumed cause to an assumed effect. To avoid a measurement error, the internal consistency was calculated for all scales, as reported above. As indicated previously, the results for identified regulation

should be interpreted with caution. Multicollinearity was tested by observing the correlation matrix which indicated no correlations above .80 among independent variables.

Measurement levels were addressed by using Likert scales of at least five categories and multiple items for all independent variables and mediator variable. The sample size to conduct path analysis was adequate – the ratio of number of cases to number of parameters was 28:1 and above the suggested ideal ratio of 20:1 by Kline (2005).

Moreover, the model(s) specified for path analysis were overidentified in order to calculate unique estimates of all variables (Kline, 2005), which is indicated by the degrees of freedom ($df > 0$). For the model comparison, the direct and mediated model had $df = 17$; whereas the mediated model as well as the direct model both had $df = 26$. Therefore, and in line with Petersen et al. (2009), only significant correlations among the independent variables were entered into the path model to avoid a saturated model. This included correlations between help-seeking and perceived stress ($r = -.124; p < .05$), help-seeking and academic overload ($r = -.141; p < .05$), intrinsic motivation and external regulation ($r = .358; p < .001$), intrinsic motivation and identified regulation ($r = .435; p < .001$), intrinsic motivation and introjected regulation ($r = .539; p < .001$), intrinsic motivation and amotivation ($r = .149; p < .05$), intrinsic motivation and self-esteem ($r = .169; p < .01$), external regulation and identified regulation ($r = .394; p < .001$), external regulation and introjected regulation ($r = .520; p < .001$), external regulation and amotivation ($r = .120; p < .05$), identified regulation and introjected regulation ($r = .359; p < .001$), identified regulation and self-esteem ($r = .120; p < .05$), introjected regulation and amotivation ($r = .190; p < .05$), amotivation and self-esteem ($r = -.130; p < .05$), amotivation and perceived stress ($r = .143; p < .05$), self-esteem and perceived stress ($r = -.265; p < .001$), and self-esteem and academic overload ($r = -.134; p < .05$). All correlations which did not reveal to be significant were treated as independent, which means that these correlations were

assumed to be zero in the path models tested.

4.2.2.1 Fit indices and model comparison

The analysis of the fit indices in the present study revealed that Model 1 shows a good overall fit to the data, with $\chi^2[17] = 23.092$, $p = .233$, NFI = .958, CFI = .992, RMSEA = .028. Model 2 and Model 3 displayed rather inadequate data fits, with $\chi^2 [26] = 116.170$, $p < .001$, NFI = .788, CFI = .817, RMSEA = .106 and $\chi^2 [26] = 88.380$, $p < .001$, NFI = .839, CFI = .875, RMSEA = .088, respectively. This is indicated by the sensitive chi-square value for both Model 2 and Model 3 but also by the other fit indices reported. Both Model 2 and Model 3 displayed NFI and CFI values that were below the recommended value of $\geq .95$ (e.g., Hu & Bentler, 1999; Lei, 2006) indicating an unacceptable fit to the data. Model 2 also showed a RMSEA value of above $> .10$ indicating a poor fit. Model 3 had an RMSEA value of .088, which according to MacCallum, Browne and Sugawara (1996) represents a mediocre fit.

The model comparison in the present study revealed that Model 2 and Model 3 were significantly different from Model 1, $\chi^2[9] = 93.077$, $p < .001$, and $\chi^2[9] = 65.288$, $p < .001$, respectively. This indicates that imposing restrictions on the base line model (Model 1) to obtain Model 2 and Model 3 results in a worsening of the overall fit of the model to the data. Thus, Model 1 including both the direct and indirect paths from the independent variables to academic performance mediated by adjustment shows the best fit to the data, which replicated the findings of Peterson et al. (2009).

Furthermore, Model 1 explained more of the variance in academic performance than both Model 2 and Model 3. Model 1 explains 29% of the variance in academic performance, compared to 26% for Model 2 and 11% for Model 3. In terms of variance explained by adjustment, both Model 1 and Model 3 explained 26% (see Table 10). Thus, hypothesis

H2.1, that the partially mediated model exceeds both the direct and totally mediated model in explaining the variance in adjustment and academic performance, was confirmed.

4.2.2.2 Interpretation of path coefficients

The next step of the study was to establish that the independent variables of help-seeking, intrinsic motivation, identified regulation and self-esteem have positive associations with adjustment and academic performance (H2.2). It was further hypothesized that the independent variables of external regulation, amotivation, academic overload and perceived stress would have negative associations with adjustment and academic performance (H2.3) and that adjustment will have a positive association with academic performance (H2.4). In order to test these assumptions, the path coefficients of the partially mediated model were calculated and evaluated. As shown in Table 10 and depicted in Figure 8, the results indicate significant positive effects of help-seeking, intrinsic motivation and self-esteem on adjustment, but not on academic performance. Identified regulation, however, did not have positive effects on either adjustment or academic performance. Thus, hypothesis H2.2 was only partially supported. Further analysis of the path coefficients revealed that only perceived stress impacted negatively on adjustment. The variables of external regulation, introjected regulation, amotivation and academic overload did not show significant negative effects on adjustment. Academic performance was negatively predicted by amotivation, academic overload and perceived stress but not by external regulation and introjected regulation. Hence, hypothesis H2.3 was only supported to some extent. Adjustment showed a significant positive effect on academic performance, confirming hypothesis H2.4.

Table 10

Variance and Path Coefficients for Model 1, 2 and 3

	Model 1		Model 2		Model 3	
	Direct and mediated effects		Direct effects only		Mediated effects only	
	Adjustment	Performance	Adjustment	Performance	Adjustment	Performance
Variance	26%	29%	-	26%	26%	11%
Adjustment	-	.234***	-	.242***	-	.335***
Help-seeking	.209***	-.035	-	-.036	.209***	-
Intrinsic motivation	.206**	-.044	-	-.045	.206**	-
External regulation	.044	.029	-	.029	.044	-
Introjected regulation	.017	.018	-	.018	.017	-
Identified regulation	-.038	-.016	-	-.016	-.038	-
Amotivation	-.005	-.225***	-	-.230***	-.005	-
Self-esteem	.127*	.019	-	.019	.127*	-
Perceived stress	-.321***	-.155**	-	-.159**	-.321***	-
Academic overload	-.090	-.318***	-	-.325***	-.090	-

Note: Estimates are standardised path coefficients: * $p < .05$; ** $p < .01$; *** $p < .001$

The significant predictors in Model 1 (see Table 10 and Figure 8) are similar to the result obtained by Peterson et al. (2009). In both studies intrinsic motivation, self-esteem and perceived stress predicted the students' adjustment to university. This indicates that students who are confident and self-determined in their ability to perform academic tasks are better adjusted to university. The results also suggest that students with high levels of self-esteem are better adjusted to university than students with lower levels of self-esteem. Perceived stress impacts negatively on adjustment, indicating that students with high levels of stress are less adjusted to the university environment. Petersen et al. (2009) also identified academic overload as a significant predictor of adjustment. Although this finding has not been replicated in the present study, the result indicates a similar trend (i.e., negative coefficient). Additionally, help seeking has a significant positive effect on adjustment only in the present study, showing that students who have a more positive attitude towards help seeking with academic problems are more adjusted to university.

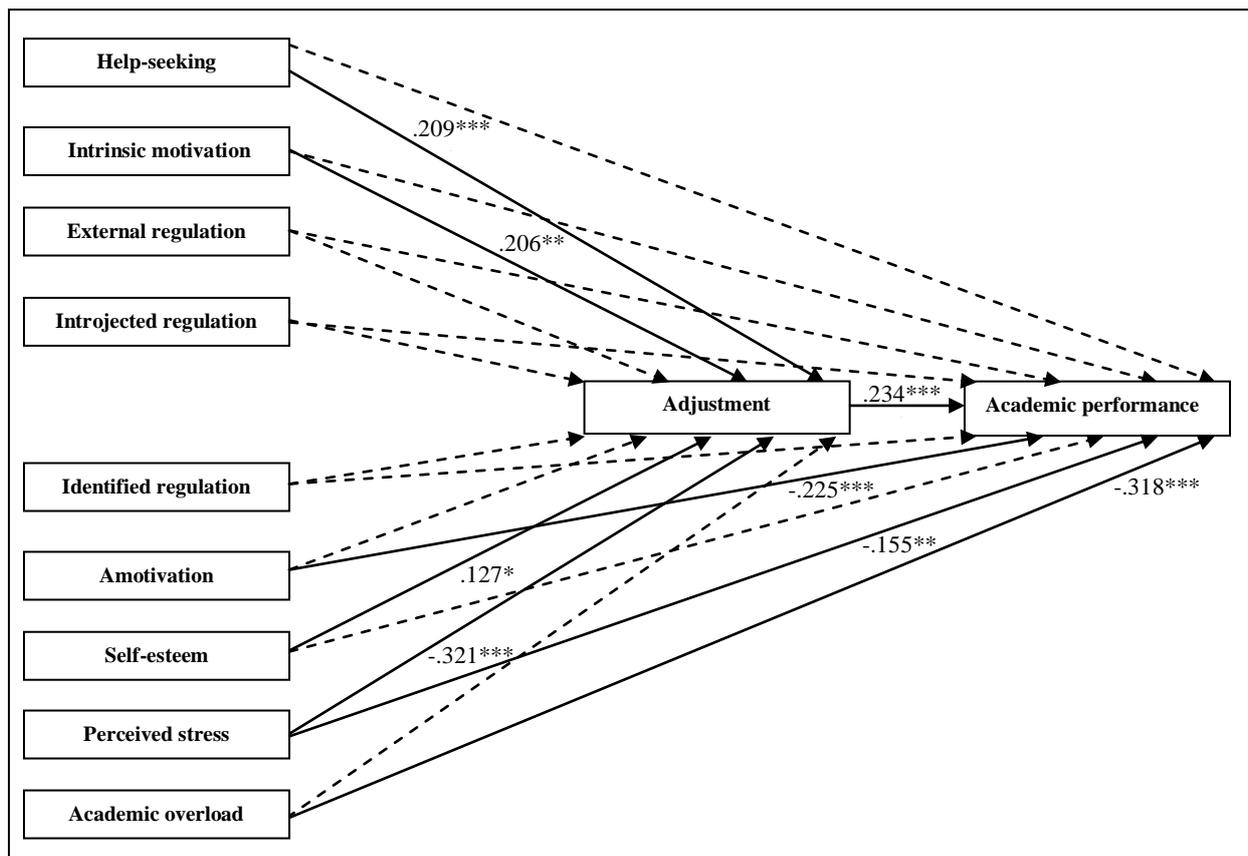


Figure 8. Results of the Direct and Mediated Model (Model 1)

Note: Estimates are standardized path coefficients: * $p < .05$; ** $p < .01$; *** $p < .001$. Dashed lines are indicative of non-significant paths.

Academic overload and adjustment were significant predictors of academic performance in the present study as well as in Petersen et al. (2009) study. The effect of academic overload on academic performance indicated that students who feel overwhelmed with their academic tasks and requirements for their courses receive lower academic marks at the end of the year. Students who are adjusted to university obtained higher academic marks at the end of the academic year.

Petersen et al. (2009) identified external regulation as a significant predictor for academic performance. However, this result could not be replicated in the present study. However, the present study found that amotivation and perceived stress predicted a students' academic performance, which was not reported by Petersen et al. (2009). The less motivated

a student is, the lower their academic marks at the end of the year. The higher the level of stress experienced by students, the lower the academic marks at the end of the year.

4.2.3 Model extension

The third aim of the present study was to extend the baseline model²⁰ (Figure 5, Model 1) by including the constructs of test-anxiety, self-efficacy and perceived social support from friends and family (Figure 9). It was hypothesized that the extended model with the added paths of self-efficacy, test anxiety, perceived social support from friends and perceived social support from family explains more of the variance in adjustment and academic performance of students at university than the baseline model (H3.1). It was therefore hypothesized that the extended model fits the data better than the baseline model. In order to test this assumption a model comparison using the nested model approach was performed.

In order to conduct path analysis for the model extension, the same assumptions as for the model comparison – outlined in the method section, were followed and tested. Similar to the model comparison, the model extension (see Figure 9) was formulated and based theoretically and empirically on previous research explaining adjustment and academic performance of students' at university to avoid a specification error. As illustrated in Figure 9, all hypothesized relationships between exogenous and endogenous variables were unidirectional and linear. That is, an arrow is always pointing from an assumed cause to an assumed effect. As for the model comparison, the internal consistency for all scales was calculated to avoid a measurement error; multicollinearity was tested by observing the correlation matrix which indicated no correlations above .80 among independent variables;

²⁰ The baseline model of the present study (Model 1) refers to the original direct and mediated model proposed by Petersen et al. (2009).

and measurement levels were addressed by using Likert scales with at least five categories and multiple items for each scale. Furthermore, the sample size to conduct path analysis was also adequate for the model extension – the ratio of number of cases to number of parameters was 20:1. The extended model was overidentified to calculate unique estimates of all variables (Kline, 2005); as indicated by the degrees of freedom ($df > 0$). The extended model had $df = 47$. Again, only significant correlations were entered into the path model to avoid a saturated model. This included correlations between help-seeking and perceived stress ($r = -.124; p < .05$), help-seeking and academic overload ($r = -.141; p < .05$), help-seeking and test-anxiety ($r = -.267; p < .001$), intrinsic motivation and external regulation ($r = .358; p < .001$), intrinsic motivation and identified regulation ($r = .435; p < .001$), intrinsic motivation and introjected regulation ($r = .539; p < .001$), intrinsic motivation and amotivation ($r = .149; p < .05$), intrinsic motivation and self-esteem ($r = .169; p < .01$), intrinsic motivation and self-efficacy ($r = .133; p < .05$), external regulation and identified regulation ($r = .394; p < .001$), external regulation and introjected regulation ($r = .520; p < .001$), external regulation and amotivation ($r = .120; p < .05$), identified regulation and introjected regulation ($r = .359; p < .001$), identified regulation and self-esteem ($r = .120; p < .05$), identified regulation and self-efficacy ($r = .151; p < .05$), introjected regulation and amotivation ($r = .190; p < .05$), amotivation and self-esteem ($r = -.130; p < .05$), amotivation and perceived stress ($r = .143; p < .05$), self-esteem and perceived stress ($r = -.265; p < .001$), self-esteem and academic overload ($r = -.134; p < .05$), self-esteem and test-anxiety ($r = -.258; p < .001$), self-esteem and self-efficacy ($r = .235; p < .001$), self-esteem and perceived social support from family members ($r = .130; p < .05$), perceived stress and test-anxiety ($r = .279; p < .001$), perceived stress and self-efficacy ($r = -.178; p < .01$), perceived stress and perceived social support from family members ($r = -.119; p < .05$), test-anxiety and self-efficacy ($r = -.271; p < .001$), self-efficacy and perceived social support from

friends ($r = .157$; $p < .01$), and perceived social support from friends and perceived social support from family members ($r = .240$; $p < .001$). All correlations which did not reveal to be significant were treated as independent, which means that these correlations are assumed to be zero in the path models tested.

4.2.3.1 Fit indices and model comparison of the extended model

The analysis of the fit indices revealed that the extended model had a very good overall fit to the data, with $\chi^2[47] = 54.251$, $p = .281$, NFI = .924, CFI = .991, RMSEA = .020, while the baseline model revealed an inadequate data fit, with $\chi^2 [55] = 90.621$, $p < .003$, NFI = .873, CFI = .943, RMSEA = .046. This was indicated by the sensitive chi-square value and by the NFI fit indices. The extended model NFI value of .924 was below the suggested value of $\geq .95$ but above the suggested value of $> .90$ (Bentler, 1992). For the baseline model the NFI value of .873 was below either recommended value (e.g., Hu & Bentler, 1999; Lei, 2006) indicating an unacceptable fit to the data. The CFI value of .991 for the extended model was close to 1, indicating an acceptable fit, compared to the value of .943 for the baseline model. Both models displayed a RMSEA value $< .05$, indicative of a good fit.

The model comparison revealed that the extended model (Figure 9) and the baseline model (Figure 5) were significantly different, $\chi^2[8] = 36.370$, $p = .000$. This suggests that constraining the extended model to the baseline model resulted in a worsening of the overall fit of the model to the data. Therefore, the extended model with the added paths of self-efficacy, test anxiety, perceived social support from friends and perceived social support from family showed the best fit to the data, confirming hypothesis H3.1.

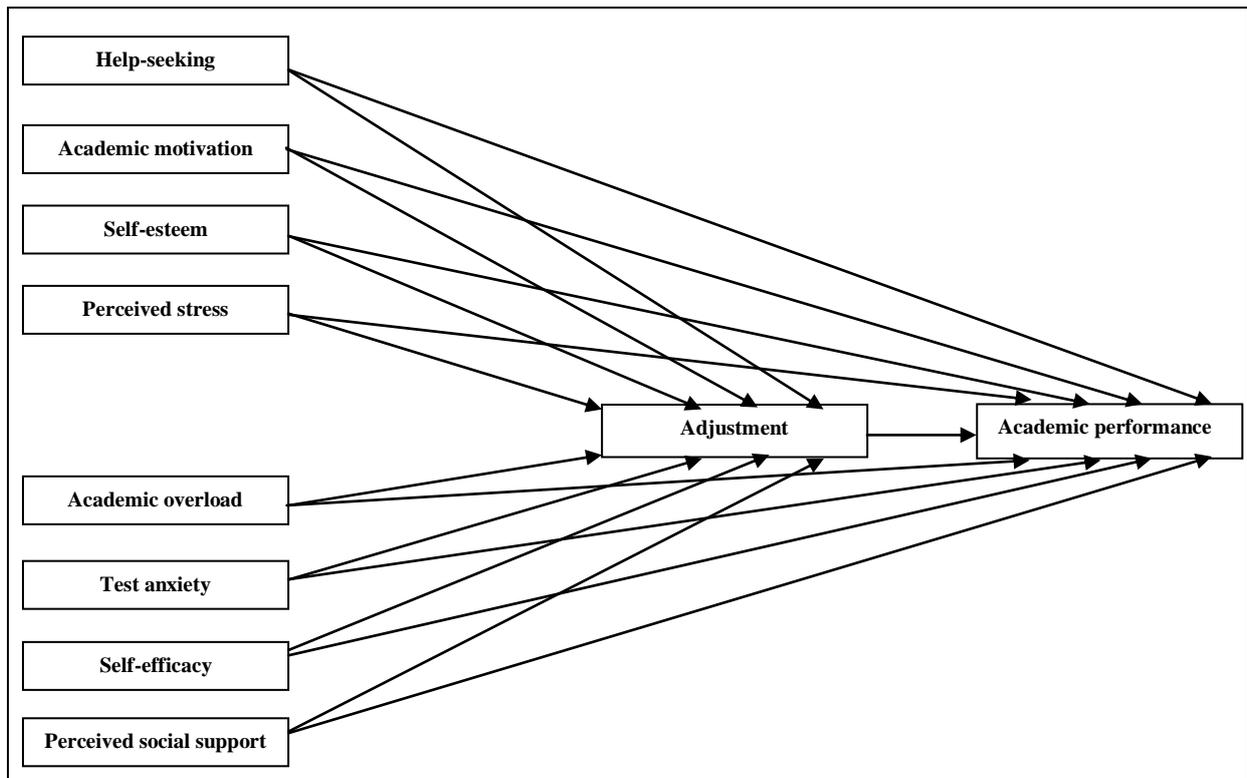


Figure 9. The Extended Model with the added paths of self-efficacy, test anxiety and perceived social support

Furthermore, the extended model explained more of the variance in adjustment and academic performance than the baseline model. The extended model explained 30% of the variance in adjustment, compared to 26% in the original model. The extended model explained 32% of the variance in academic performance, compared to 28% in the baseline model (see Table 11). Thus, hypothesis H3.1 is confirmed.

4.2.3.2 Interpretation of path coefficients for the extended model

A further aim of the study was to establish whether the added independent variables of self-efficacy, perceived social support from friends and perceived social support from family have positive associations with adjustment and academic performance (H3.2); and whether the added path of test anxiety is negatively associated with adjustment and academic performance (H3.3). Adjustment was hypothesized to have a positive association with

academic performance (H3.4). In order to test these assumptions, the path coefficients of the extended model were calculated and evaluated (see Table 11). As shown in Table 11 and illustrated in Figure 10, the results did not indicate significant positive effects of self-efficacy ($\beta = .065$; $p > .05$) and perceived social support from family ($\beta = -.048$; $p > .05$) on adjustment. Perceived social support from friends ($\beta = .088$) showed only a significant positive effect on adjustment at the $p < .10$ level. The perceived social support variables had no significant positive effect on academic performance. However, self-efficacy ($\beta = .146$; $p < .01$) had a significant positive effect on academic performance. Thus, hypothesis H3.2 was only partially supported. The results did, however, indicate a significant negative effect of test anxiety ($\beta = -.194$; $p < .001$) on adjustment; and a direct significant negative effect of test anxiety ($\beta = -.173$; $p < .01$) on academic performance. These results confirm hypothesis H3.3. Finally, as expected, adjustment ($\beta = .181$; $p < .01$) had a significant positive effect on academic performance, confirming hypothesis H3.4.

Table 11

Variance and Path Coefficients for Petersen et al. Model and Extended Model

	Petersen Model		Extended Model	
	Direct and mediated effects		Direct and mediated effects	
	Adjustment	Academic performance	Adjustment	Academic performance
Variance	26%	28%	30%	32%
Adjustment	-	.234***	-	.181**
Help-seeking	.209***	-.035	.157**	-.064
Intrinsic motivation	.206**	-.044	.176**	-.056
Extrinsic regulation	.044	.029	.046	.039
Introjected regulation	.017	.018	.021	.023
Identified regulation	-.037	-.016	-.025	-.031
Amotivation	-.005	-.225***	-.007	-.223***
Self-esteem	.126*	.019	.084	-.028
Perceived stress	-.320***	-.155**	-.282***	-.121*
Academic overload	-.090†	-.319***	-.091†	-.326***
Test-anxiety	-	-	-.194***	-.173**
Self-efficacy	-	-	.065	.146**
PSS from friends	-	-	.088†	-.028
PSS from family	-	-	-.048	.005

Note: Estimates are standardised path coefficients: † < .10; *p < .05; **p < .01; ***p < .001.

PSS from friends = perceived social support from friends; PSS from family = perceived social support from family.

In summary, the added construct of self-efficacy in the extended model positively predicted the academic performance of students, indicating that students who believe in their abilities to perform a task have greater success at university. The added construct of perceived social support from friends marginally positively predicted the adjustment of students. Hence, students with perceived social support from friends are better adjusted to university life. Finally, the added construct of test anxiety predicted both adjustment and academic performance of students negatively, indicating that students with high levels of test anxiety are less adjusted to university life and achieve lower grades at university. No

significant effect was found for the variable of perceived social support from family members.

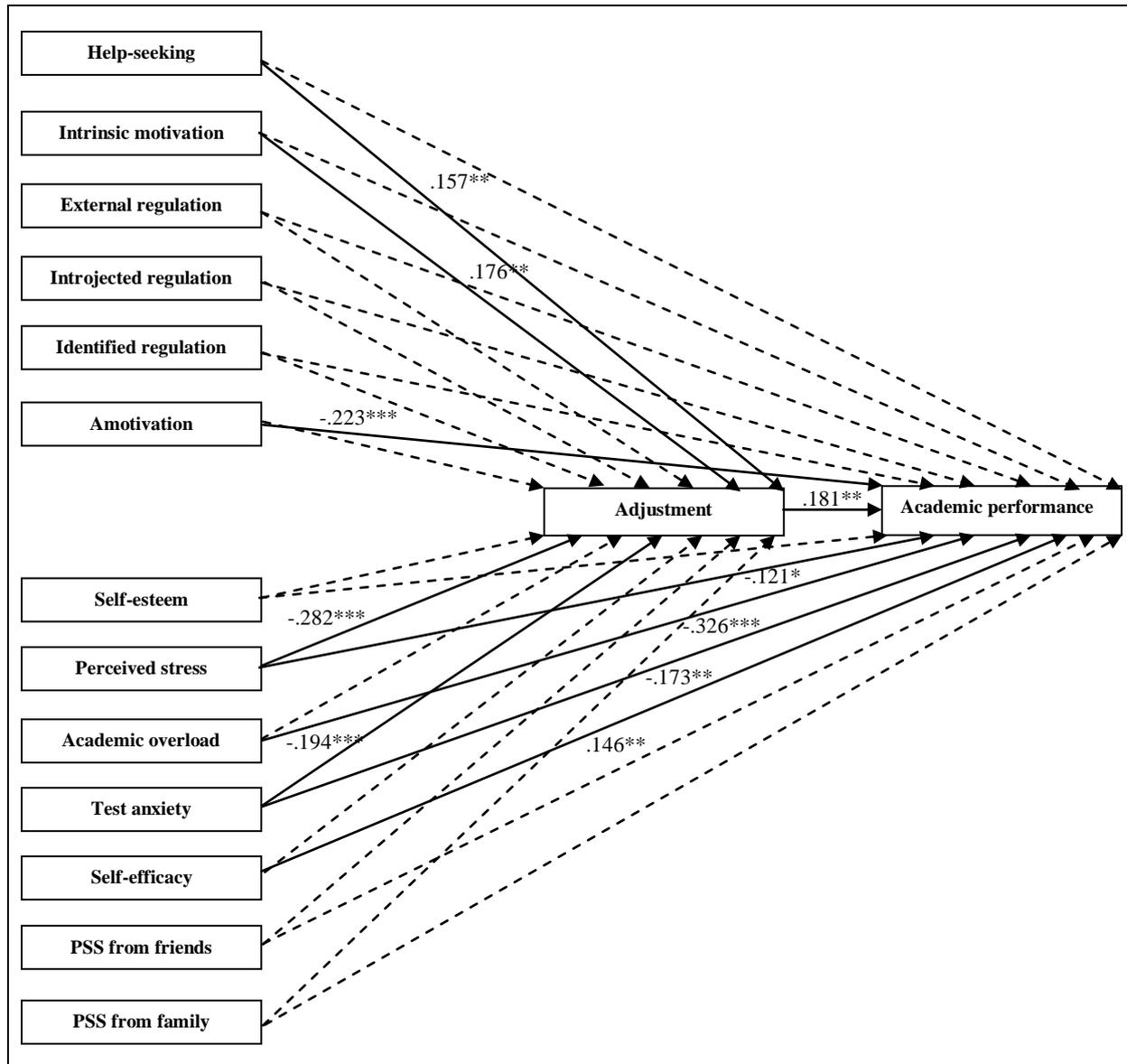


Figure 10. Results of the Extended Model with the added paths of self-efficacy, test anxiety

and perceived social support

Note: Estimates are standardized path coefficients: *p < .05; **p < .01; ***p < .001. Dashed lines are indicative of non-significant paths. PSS from friends = perceived social support from friends; PSS from family = perceived social support from family.

4.2.4 Group comparisons and test of moderators

The characteristics of the present sample indicated that it was fairly homogenous and

representative of the overall student population at UFH. For example, as indicated previously in Table 6, the majority of participants are black (96.4%), attended a government high school (80.4%) and have Xhosa as their first language (69.6%). The sample is therefore considered adequate to conduct group comparisons. It is noted, however, that the sample for the present study consists of slightly more males (55%) than females (45%) and that it is overrepresented by students who stay in a university residence (68.6%) compared to students who reside off-campus (31.4%). Also, slightly more older students (21 years of age and above, 56%) than younger students (17 – 20 years of age, 44%) participated in the present study.

4.2.4.1 Group comparison by gender

Following the results of the model extension, the subsequent aim of the present study was to identify significant differences between male and female participants among the independent, mediating and dependent variables; as well as to test whether gender functioned as a moderator variable for the extended model (Figure 9).

In line with previous research it was hypothesized that female students will display higher levels of intrinsic motivation, academic overload, perceived stress and test anxiety than male students (H4a1). Furthermore, female students were expected to display more positive attitudes towards help-seeking, as well as to receive more social support from their friends than their male counterparts. It was further hypothesized that male students will have higher levels of extrinsic motivation and will be more amotivated than female students at university (H4a2). In addition, female students were expected to be better adjusted and to perform better academically at university than male students. No gender differences were assumed for the variables of self-esteem, self-efficacy and perceived social support from family (H4a3).

Additionally, it was hypothesized that the path from introjected regulation to adjustment would be an important predictor for male students; whereas the path from self-esteem to adjustment would be an important predictor for female students. The path from perceived stress to adjustment was hypothesized to be an important predictor for all students, but to be more important for male students (H4a4). The paths from identified regulation, self-esteem, academic overload and adjustment to academic performance were hypothesized to be significant for male students; whereas the path from amotivation to academic performance was predicted to be important for female students. The effect of test-anxiety on academic performance was hypothesized to be significant for all students, but to be a more important predictor for male students (H4a5). Finally, gender was hypothesized not to moderate the paths between intrinsic motivation and academic performance and between self-efficacy and academic performance (H4a6). In summary, moderator effects of gender were hypothesized for the paths between introjected regulation and adjustment, self-esteem and adjustment and between perceived stress and adjustment. In addition, moderator effects of gender were hypothesized for the paths between identified regulation and academic performance, self-esteem and academic performance, amotivation and academic performance, academic overload and academic performance, test-anxiety and academic performance, and between adjustment and academic performance.

In order to test for gender differences among the variables, independent samples t-tests were conducted first. To test whether gender functioned as a moderator, path analysis using the model comparison approach was conducted.

Independent sample t-tests were conducted for all independent variables, mediating variable and dependent variable to examine possible differences between male and female participants. As can be seen in Table 12, the females reported marginally higher levels of intrinsic motivation and significantly higher levels of perceived stress compared to males.

Similarly, the males reported higher levels of academic overload than the females. In summary, no significant differences between male and female participants were found for the independent variables of help-seeking, extrinsic motivation, amotivation, self-esteem, test anxiety, self-efficacy, perceived social support from friends and perceived social support from family; mediating variable of adjustment and dependent variable of academic performance. These results indicated that hypothesis H4a1, which stated that female students have a more positive attitude towards help-seeking, higher levels of intrinsic motivation, social support from friends, academic overload, perceived stress and test-anxiety, as well as being better adjusted and performing better academically than male students at university, was only partially supported. Hypothesis H4a2, that male students have higher levels of extrinsic motivation and amotivation than female students, was not confirmed at all. Results did however confirm hypothesis H4a3, which assumed no gender differences for the variables of self-esteem, self-efficacy and perceived social support from family members.

Table 12

Independent Samples t-test of all Variables between Male and Female Participants

Variables	Male		Female		t-test		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Help-seeking	4.47	0.98	4.41	1.09	0.513	278	>.05
<i>Motivation</i>							
Intrinsic	4.91	0.97	5.14	1.05	1.906†	278	<.10
Extrinsic	5.54	0.86	5.72	0.90	1.645	278	>.05
Amotivation	1.28	0.61	1.25	0.74	0.424	278	>.05
Self-esteem	4.24	0.51	4.22	0.56	0.339	278	>.05
Perceived stress	1.62	0.60	1.94	0.56	4.539*	278	<.001
Academic overload	3.13	0.73	2.86	0.76	3.014*	278	<.01
Test-anxiety	2.67	0.76	2.79	0.72	1.269	278	>.05
Self-efficacy	4.05	0.59	4.06	0.62	0.191	278	>.05
<i>Perceived social support</i>							
From friends	4.23	1.05	4.38	0.94	1.101	278	>.05
From family	4.67	1.05	4.70	1.13	0.216	278	>.05
<i>Adjustment to university</i>							
Academic	6.55	1.14	6.55	1.28	0.009	278	>.05
Social	6.26	1.16	6.25	1.07	0.025	278	>.05
Personal & Emotional	6.11	1.57	5.97	1.63	0.745	278	>.05
Institutional Attachment	7.27	1.08	7.21	1.22	0.469	278	>.05
Academic performance	63.40	10.67	63.96	9.80	0.451	274	>.05

Note: Statistically significant differences between male and female students are indicated in bold

4.2.4.2 Gender as Moderator

In order to test whether gender acted as a moderator, path analysis was conducted using the model comparison approach. Here, a two group path invariance test was calculated across gender by simultaneously estimating a constrained model with cross group equality constraints on path estimates and an unconstrained model where path parameters were free to vary between genders. Thereafter, the chi-square difference tests were used to test if the paths in the extended model are similar across gender. The model fits of the unconstrained model were $\chi^2[94] = 144.654$, $p = .002$, NFI = .832, CFI = .925, RMSEA = .041. The model fits of the constrained model were $\chi^2[120] = 171.142$, $p = .003$, NFI = .802, CFI = .924, RMSEA =

.037. The results for the male and female models (including direct and mediated paths) are reported in Table 13 and depicted in Figure 11.

Table 13

Variance and Path Coefficients for Extended Model for Males and Females

	Adjustment		Academic Performance							
	Male	Female	χ^2			Male	Female	χ^2		
			CMIN	<i>p</i>	df			CMIN	<i>p</i>	df
Variance	36%	28%				36%	37%			
Adjustment	-	-				.223**	.150			
Help-seeking	.168*	.152	.045	.832	1	-.086	-.055	.195	.658	1
Intrinsic motivation	.222**	.091	1.035	.309	1	-.039	-.095	.113	.737	1
Extrinsic regulation	.119	-.038	1.546	.214	1	.083	-.050	1.273	.259	1
Introjected regulation	-.066	.078	1.048	.306	1	.138	-.044	1.959	.162	1
Identified regulation	-.145	.079	2.979	.084	1	-.030	.041	.353	.553	1
Amotivation	-.051	.042	.732	.392	1	-.308***	-.159*	3.379	.066	1
Self-esteem	.185**	.037	1.754	.185	1	-.149*	.007	2.337	.126	1
Perceived stress	-.310***	-.241**	.103	.748	1	-.099	-.126	.027	.869	1
Academic overload	-.070	-.102	.106	.744	1	-.322***	-.384***	.004	.950	1
Test-anxiety	-.099	-.272***	2.992	.084	1	-.211**	-.170*	.255	.614	1
Self-efficacy	.140*	.054	.554	.457	1	.042	.190*	1.365	.243	1
PSS from friends	.062	.078	.064	.800	1	.087	-.102	3.091	.079	1
PSS from family	.025	-.074	.802	.371	1	-.087	.085	2.676	.102	1

Note: Estimates are standardised path coefficients: †*p* < .10, **p* < .05; ***p* < .01; ****p* < .001
 Path coefficients that significantly differed statistically between male and female are indicated in bold.

As shown in Table 13 above, no statistically significant differences were found between male and female participants for the paths between the independent variables and adjustment and academic performance at *p* < .05. Therefore, hypothesis H4a4 and H4a5 were

not confirmed. Hypothesis H4a6, which stated that there are no significant gender differences for the path between intrinsic motivation and academic performance and for the path between self-efficacy and academic performance, was confirmed. Upon closer investigation, marginal effects were, however, found at $p < .10$ for the path between test-anxiety and adjustment; and for the path between amotivation and academic performance. The results for adjustment suggest that test-anxiety seems to be an important predictor of adjustment for females ($\beta = -.272$; $p < .001$) but less for males ($\beta = -.099$; $p > .10$). The results for academic performance showed, on the other hand, that amotivation is seemingly a more important predictor of academic performance for males ($\beta = -.308$; $p < .001$) than for females ($\beta = -.159$; $p < .05$). Although the results displayed other differences as well, they did not reach a marginal effect. However, care should be taken in interpreting the above results, as the paths are only marginally significant on a level of $p < .10$.

In summary, only three psychosocial constructs were indicative of score difference among male and female students. Female students scored marginally higher for intrinsic motivation and significantly higher for the amount of perceived stress experienced at university than male students. Male students on the other hand were found to score significantly higher for academic overload compared to female students. Furthermore, gender did not act as a moderator for the extended model, as only two marginal effects were found. The extended model explained more of the variance in students' adjustment to university among male students (36%) than among female students (28%). The explained variance in academic performance for male students (36%) and female students (37%) was nearly identical.

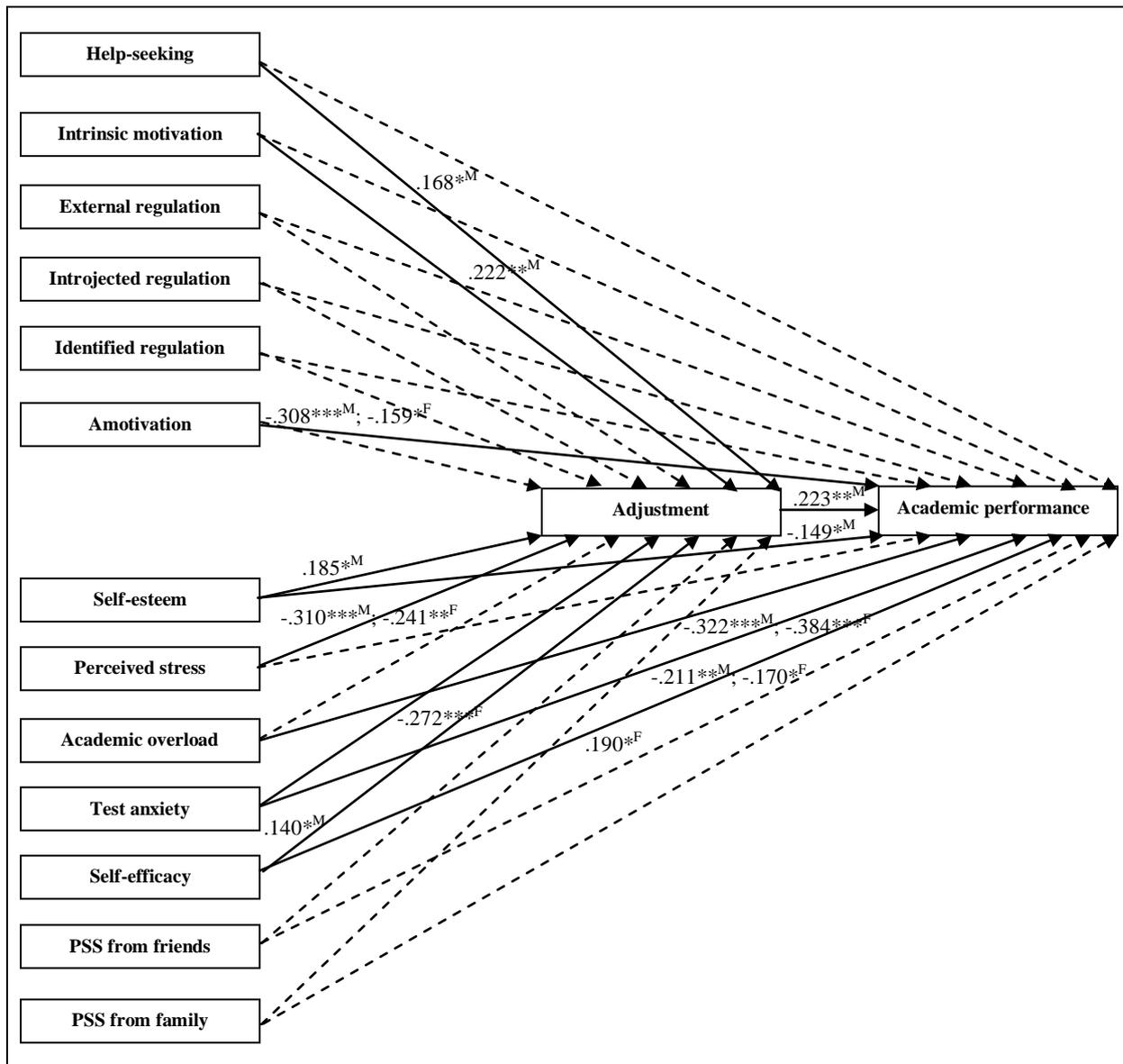


Figure 11. Results of the Extended Model for male and female students

Note: Estimates are standardized path coefficients: * $p < .05$; ** $p < .01$; *** $p < .001$. Dashed lines are indicative of non-significant paths. PSS from friends = perceived social support from friends; PSS from family = perceived social support from family. M = male; F = female.

4.2.4.3 Group comparison by age

Group comparison was conducted in order to test whether there are significant differences between younger (17 – 20 years of age) and older (21 years of age and above) participants among the independent, mediating and dependent variables; as well as to test whether age functioned as a moderator variable for the extended model (Figure 9). Based on previous research it was hypothesized that older students will be more intrinsically

motivated, display higher levels of self-efficacy and perform better academically than younger students (H4b1). It was further hypothesized that younger students will be more extrinsically motivated, better adjusted socially at university and to have higher levels of perceived stress than older students at university (H4b2). Additionally, no age differences were expected for the variables of perceived social support from friends, perceived social support from family and academic adjustment to university (H4b3). Finally, it was assumed that self-efficacy is an important predictor for academic performance for older students (H4b4). In order to test for age differences among the variables, independent samples t-tests were conducted. To test if age functioned as a moderator, path analysis using the group comparison approach was conducted to examine differences between younger and older participants for each of the paths (mediating and direct paths) (Figure 9).

Independent samples t-tests were conducted for all independent variables, mediating variable and dependent variable to examine possible differences between younger and older participants. As can be seen in Table 14, the older group reported marginally more positive attitudes toward help-seeking and are marginally better adjusted academically to university than the younger group. Younger participants, on the other hand, were more extrinsically motivated, experienced higher levels of perceived stress and exhibited higher levels of test-anxiety than older participants. In summary, no significant differences between young and older participants were found for the independent variables of intrinsic motivation, amotivation, self-esteem, academic overload, self-efficacy, perceived social support from friends and perceived social support from family; as well as for the mediating variables of social adjustment, personal and emotional adjustment and institutional attachment; and dependent variable of academic performance. The results for help-seeking and academic adjustment should be interpreted with caution, as the differences are only marginally significant on a level of $p < .10$. The results indicate that hypothesis H4b1, which stated that

older students are more intrinsically motivated, have higher levels of self-efficacy and perform better academically at university than younger students was not supported.

Hypothesis H4b2, which stated that younger students are more extrinsically motivated, better adjusted socially to university and have higher levels of perceived stress than older students, was partially confirmed. Additionally, hypothesis H4b3, which stated that there are no age differences for the variables of perceived social support from friends and family members and academic adjustment to university, was partially confirmed.

Table 14

Independent Samples t-tests of all Variables between Young and Older Participants

Variables	Young		Old		t-test		
	(17-20)		(21 >)		<i>t</i>	<i>df</i>	<i>P</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Help-seeking	4.32	1.03	4.56	1.01	1.914†	277	<.10
<i>Motivation</i>							
Intrinsic	4.99	1.06	5.03	0.97	0.290	277	>.05
Extrinsic	5.75	0.87	5.52	0.89	2.144*	277	<.05
Amotivation	1.30	0.83	1.25	0.51	0.688	277	>.05
Self-esteem	4.22	0.51	4.23	0.55	0.195	277	>.05
Perceived stress	1.87	0.55	1.69	0.63	2.415*	277	<.05
Academic overload	3.07	0.76	2.95	0.74	1.414	277	>.05
Test-anxiety	2.89	0.72	2.59	0.73	3.406*	277	<.001
Self-efficacy	4.07	0.61	4.05	0.60	0.259	277	>.05
<i>Perceived social support</i>							
From friends	4.33	0.94	4.30	1.05	0.267	277	>.05
From family	4.77	1.07	4.61	1.10	1.224	277	>.05
<i>Adjustment to university</i>							
Academic	6.41	1.16	6.66	1.22	1.726†	277	<.10
Social	6.26	1.04	6.26	1.17	0.038	277	>.05
Personal & Emotional	5.93	1.50	6.15	1.67	1.166	277	>.05
Institutional Attachment	7.19	1.11	7.29	1.17	0.767	277	>.05
Academic performance	62.98	9.33	64.16	10.98	0.940	273	>.05

Note: Statistically significant differences between younger and older students are indicated in bold

4.2.4.4 Age as moderator

To test whether age acted as a moderator for the extended model, path analysis was conducted using the model comparison approach. Again, a two group path invariance test was calculated, this time across age by simultaneously estimating a constrained model with cross group equality constraints on path estimates and an unconstrained model where path parameters are free to vary between younger and older participants. Thereafter, the chi-square difference tests were used to identify whether the paths in the extended model are similar across age. The model fits of the unconstrained model were $\chi^2[94] = 122.717, p = .046, NFI = .853, CFI = .958, RMSEA = .030$; whereas the model fits of the constrained model were $\chi^2[120] = 146.991, p = .078, NFI = .824, CFI = .961, RMSEA = .026$. The results of the model comparison are reported in Table 15 and shown in Figure 12.

As shown in Table 15, results indicated that intrinsic motivation is an important predictor of adjustment for older participants but not for younger participants. Similarly, the results further showed that self-efficacy is an important predictor of adjustment for older participants but not for younger participants. Other path differences were not statistically significant. Hypothesis H4b4 that self-efficacy is an important predictor for academic performance for older students was therefore not supported.

In summary, results indicated that there were three score differences for the psychosocial constructs of the present study between younger and older students. Younger students scored significantly higher for extrinsic motivation, perceived stress and test-anxiety experienced at university compared to older students. In addition, only two paths were found that differed significantly in the extended model (the path between intrinsic motivation and adjustment and the path between self-efficacy and adjustment). No path differences were found between independent variables and academic performance. Therefore, age acted as a moderator only for two paths between psychosocial constructs and adjustment to university,

but not for academic performance. The extended model explained more of the variance in students' adjustment to university among older students (43%) than among younger students (19%). Also, the extended model explained more of the variance in academic performance for younger students (44%) than older students (28%).

Table 15

Variance and Path Coefficients for Extended Model for Young and Older Participants

	Adjustment					Academic Performance				
	Young	Old	χ^2			Young	Old	χ^2		
			CMIN	p	df			CMIN	p	df
Variance	19%	43%				44%	28%			
Adjustment	-	-				.198**	.146			
Help-seeking	.179*	.132*	.105	.746	1	-.018	-.068	.273	.601	1
Intrinsic motivation	.021	.273***	4.361	.037	1	-.188*	.044	2.689	.101	1
Extrinsic regulation	.129	.027	.614	.433	1	.064	.041	.022	.881	1
Introjected regulation	.081	-.034	.675	.411	1	.028	.012	.013	.909	1
Identified regulation	-.056	-.036	.014	.906	1	.074	-.123	2.775	.096	1
Amotivation	.043	-.033	.471	.493	1	-.250***	-.181*	.288	.591	1
Self-esteem	.140	.031	.933	.334	1	.023	-.055	.559	.455	1
Perceived stress	-.193*	-.347***	1.460	.227	1	-.081	-.182*	.880	.348	1
Academic overload	-.108	-.058	.167	.683	1	-.383***	-.295***	.082	.774	1
Test-anxiety	-.178*	-.228**	.275	.600	1	-.201**	-.156	.034	.853	1
Self-efficacy	-.080	.154*	4.537	.033	1	.162*	.129	.006	.940	1
PSS from friends	.057	.084	.041	.839	1	-.099	.023	1.284	.257	1
PSS from family	-.052	-.045	.003	.960	1	.094	-.064	2.285	.131	1

Note: Estimates are standardised path coefficients: *p < .05; **p < .01; ***p < .001

Path coefficients that significantly differed statistically between young and old students are indicated in bold.

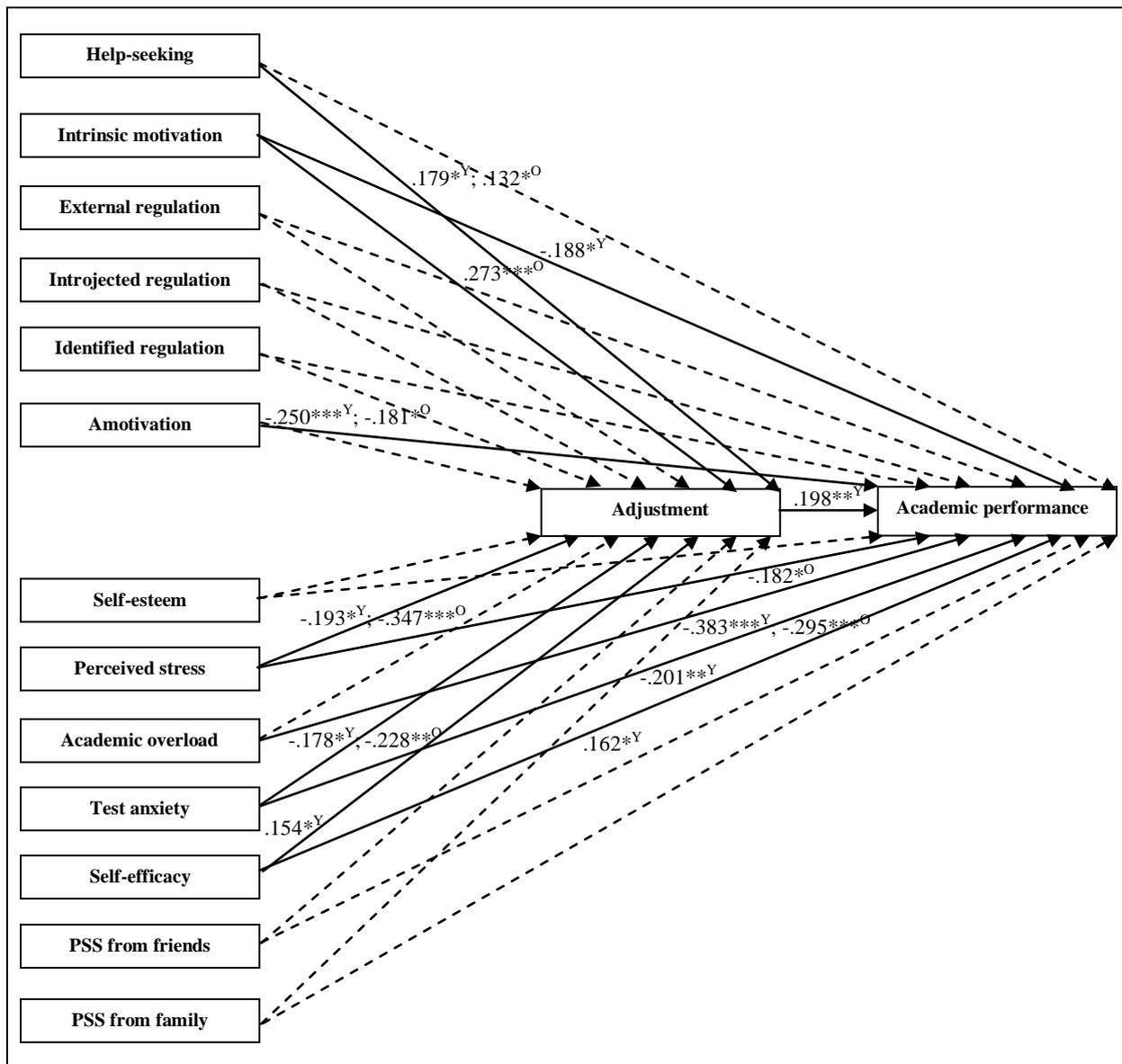


Figure 12. Results of the Extended Model for young and old students

Note: Estimates are standardized path coefficients: * $p < .05$; ** $p < .01$; *** $p < .001$. Dashed lines are indicative of non-significant paths. PSS from friends = perceived social support from friends; PSS from family = perceived social support from family. Y = young; O = old.

4.2.4.5 Group comparison by residence status (students living on or off campus)

Finally, tests were conducted to establish whether students living on campus and students living off campus during the academic year differ significantly in their scores of the independent, mediating and dependent variables; as well as whether a student's residence status functioned as a moderator variable (Figure 9). Previous research suggested that

students who reside in a university residence during the academic year will perform better academically and acquire higher academic marks, and be better adjusted socially to the university than students who reside off campus (H4c1). It was further hypothesized that there will be no differences for the variables of self-esteem, self-efficacy, perceived stress, perceived social support from friends and perceived social support from family (H4c2). Additionally, it was tentatively assumed that residence status would function as a moderator variable; and that there will be path differences between students living on campus and off campus for the independent variables on adjustment and academic performance (H4c3). In order to test if students living on and off campus during the academic year displayed differences among the variables, independent samples t-tests were conducted. To test if a student's residence status functioned as a moderator, path analysis using group comparisons was conducted which examined differences between students living on and off campus for each of the paths (mediating and direct paths) included in the extended model (Figure 9).

Independent samples t-test were conducted for all independent variables, mediating variable and dependent variable to examine possible differences between students living on campus and students living off campus. As it can be seen in Table 16, students living on campus during the academic year reported higher levels of self-efficacy, received higher overall academic marks and were marginally better adjusted academically and socially to university than students living off campus during the academic year. Students living off campus during the academic year, on the other hand, displayed higher levels of test-anxiety than students residing in a university residence.

Table 16

Independent Samples t-tests of all Variables between Students Living On and Off Campus

Variables	Students living on campus		Students living off campus		t-test		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Help-seeking	4.46	1.03	4.41	1.02	0.402	278	>.05
<i>Motivation</i>							
Intrinsic	5.07	0.96	4.87	1.11	1.558	278	>.05
Extrinsic	5.64	0.84	5.58	0.98	0.511	278	>.05
Amotivation	1.24	0.66	1.34	0.70	1.223	278	>.05
Self-esteem	4.23	0.52	4.22	0.54	0.140	278	>.05
Perceived stress	1.77	0.60	1.76	0.62	0.159	278	>.05
Academic overload	3.05	0.78	2.92	0.70	1.304	278	>.05
Test-anxiety	2.66	0.72	2.86	0.76	2.062*	278	<.05
Self-efficacy	4.15	0.58	3.84	0.61	4.119*	278	<.001
<i>Perceived social support</i>							
From friends	4.34	0.99	4.24	1.03	0.791	278	>.05
From family	4.67	1.05	4.72	1.17	0.368	278	>.05
<i>Adjustment to university</i>							
Academic	6.64	1.14	6.36	1.30	1.794†	278	<.10
Social	6.33	1.10	6.09	1.14	1.731†	278	<.10
Personal & Emotional	6.12	1.60	5.90	1.59	1.074	278	>.05
Institutional Attachment	7.31	1.13	7.10	1.17	1.428	278	>.05
Academic performance	65.08	10.05	60.51	10.11	3.492*	274	<.001

Note: Statistically significant differences between students living on and off campus are indicated in bold

In summary, no significant differences between students living on and off campus were found for the independent variables of help-seeking, intrinsic motivation, extrinsic motivation, amotivation, self-esteem, perceived stress, academic overload, perceived social support from friends and perceived social support from family; as well as for the mediating variables of personal and emotional adjustment and institutional attachment. The results for academic adjustment and social adjustment should be interpreted with caution, as the differences are only marginally significant on a level of $p < .10$. In summary, hypotheses H4c1, which stated that students living on campus are better adjusted socially to university

and perform better academically than students living off campus; and H4c2, which stated that there will be no differences for the variables of self-esteem, perceived stress, self-efficacy, perceived social support from friends and perceived social support from family members between students living on or off campus during the academic year, were both partially confirmed.

4.2.4.6 Residence status as moderator

To test whether residence status acted as a moderator, path analysis was conducted using the model comparison approach. A two group path invariance test was calculated, this time across residence status by simultaneously estimating a constrained model with cross group equality constraints on path estimates and an unconstrained model where path parameters are free to vary between students living on campus and students living off campus. Thereafter, the chi-square difference tests were used to test if the paths in the extended model were similar across residence status. The model fits of the unconstrained model were $\chi^2[94] = 129.317, p = .019, NFI = .848, CFI = .949, RMSEA = .034$. The model fits of the constrained model were $\chi^2[120] = 160.156, p = .016, NFI = .812, CFI = .941, RMSEA = .032$. The results of the model comparison are reported in Table 17 and illustrated in Figure 13.

As shown in Table 17, results indicate that academic overload predicted adjustment with students living on campus but not with students living off campus. Similarly, the results for academic performance showed that self-esteem is an important predictor for academic performance with students living off campus but not for students living on campus. All other differences were not statistically significant. Hypothesis H4c3, which tentatively predicted students' residence status to function as a moderator variable and that there will be path differences between students living on or off campus, was therefore only partially confirmed.

Table 17

Variance and Path Coefficients for Extended Model for Students Living On and Off Campus

	Adjustment					Academic Performance				
	Students living on campus	Students living off campus	χ^2			Students living on campus	Students living off campus	χ^2		
	30%	42%	CMIN	<i>p</i>	df	32%	42%	CMIN	<i>p</i>	df
Variance	30%	42%				32%	42%			
Adjustment	-	-				.161*	.188			
Help-seeking	.171**	.237**	.441	.507	1	-.101	.074	1.999	.157	1
Intrinsic motivation	.143	.219*	.171	.679	1	-.097	-.014	.468	.494	1
Extrinsic regulation	.090	.097	.000	.992	1	.148*	-.084	3.246	.072	1
Introjected regulation	-.053	.192	2.643	.104	1	-.023	.122	.878	.349	1
Identified regulation	.022	-.226*	3.362	.067	1	-.044	-.108	.187	.666	1
Amotivation	.049	-.163	3.505	.061	1	-.213***	-.142	.406	.524	1
Self-esteem	.110	.030	.414	.520	1	-.094	.177†	4.661	.031	1
Perceived stress	-.244***	-.348***	.860	.354	1	-.093	-.209*	.815	.367	1
Academic overload	-.167**	.098	4.889	.027	1	-.373***	-.240**	.762	.383	1
Test-anxiety	-.235***	-.087	1.581	.209	1	-.172**	-.087	.581	.446	1
Self-efficacy	.024	.075	.182	.670	1	.093	.075	.044	.833	1
PSS from friends	.059	.061	.001	.978	1	-.033	-.073	.105	.746	1
PSS from family	-.097	.022	1.150	.283	1	.028	-.068	.703	.402	1

Note: Estimates are standardised path coefficients: †*p* < .10; **p* < .05; ***p* < .01; ****p* < .001

Path coefficients that significantly differed statistically between residence and non-residence students are indicated in bold.

In summary, only three psychosocial constructs were indicative of score differences among students living on campus or off campus during the academic year. Students residing on campus scored significantly higher in terms of self-efficacy and in the level of academic performance compared to students residing off campus. Students living off campus on the other hand were found to score significantly higher for test-anxiety compared to students living on campus. In terms of path differences, results indicated that academic overload was

an important predictor of adjustment for students living on campus; and self-esteem was an important predictor of academic performance for students living off campus. The extended model was able to explain more of the variance in students' adjustment to university among students living off campus (42%) than among students living on campus (30%). Similarly, the extended model explained more of the variance of students' academic performance among students living off campus (42%) than among students living on campus (32%).

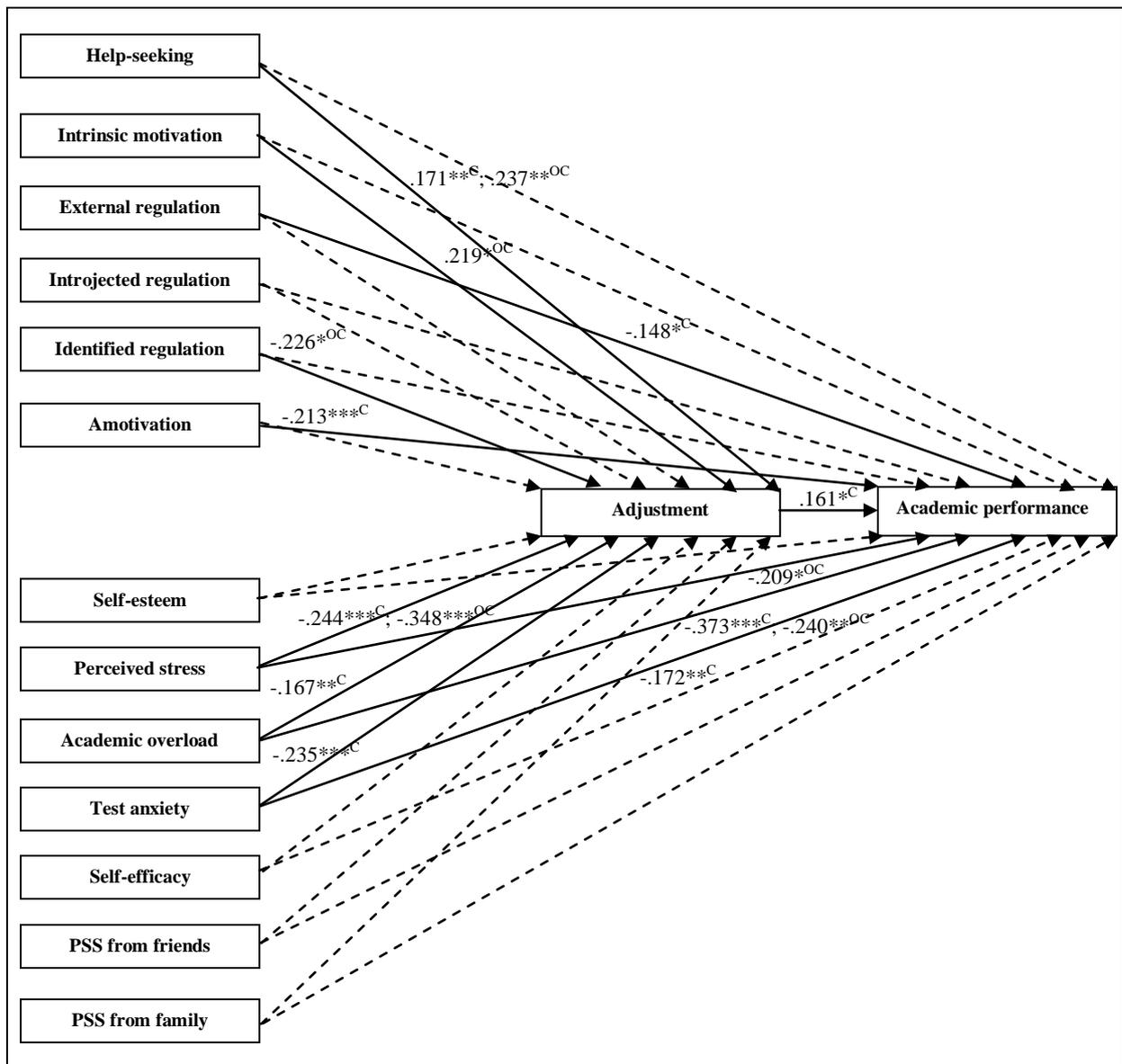


Figure 13. Results of the Extended Model for students living on and off campus

Note: Estimates are standardized path coefficients: *p < .05; **p < .01; ***p < .001. Dashed lines are indicative of non-significant paths. PSS from friends = perceived social support from friends; PSS from family = perceived social support from family. C = living on campus; OC = living off campus.

To conclude, a summary of the results of all tested hypotheses of the present study are presented in Table 18 below. As shown in Table 18 below, most of the hypotheses were either confirmed or partially confirmed. The results of the present study partially confirmed the hypothesized relationships between psychosocial constructs and adjustment and academic performance (H1.1 and H1.2) and confirmed the positive relationship between adjustment and academic performance (H1.3). The results for the model comparison showed that the hypotheses were either confirmed (H2.1 and H2.4) or partially confirmed (H2.2 and H2.3). For the model extension results indicated that hypotheses H3.1, H3.3 and H3.4 were all confirmed, whereas H3.2 was partially confirmed. The results for the moderator analysis for both gender and age did not support all hypotheses. Although it was confirmed that there were no differences for the psychosocial constructs of self-esteem, self-efficacy and perceived social support from family members between male and female students (H4a3) and that gender does not moderate the path between intrinsic motivation and academic performance as well as between self-efficacy and academic performance (H4a6); differences for the psychosocial constructs of intrinsic motivation, perceived-stress, academic overload, test-anxiety, perceived social support from friends and academic performance between male and female students (H4a1) was only partially supported. No support at all was found for hypotheses H4a2, H4a4 and H4a5, as depicted in Table 18 below. Similarly, the moderator analysis for age showed that hypotheses H4b2 and H4b3 were partially supported. No support at all was found for the hypothesized difference between younger and older students for the psychosocial constructs of intrinsic motivation, self-efficacy and academic performance (H4b1). Also, no support at all was found for the hypothesized role of age as a moderator for the path between self-efficacy and academic performance (H4b4). The formulated hypotheses related to a student's residence status at university (H4c1, H4c2 and H4c3) were all partially confirmed.

Table 18

Summary Results of Tested Hypotheses of the Present Study

Hypotheses	confirmed	partially confirmed	not supported at all
<i>Relationships of psychosocial constructs to Adj and AP</i>			
H1.1: Help-seeking, intrinsic motivation, self-esteem, self-efficacy, PSS from friends and PSS from family positively related to Adj and AP.		•	
H1.2: External motivation, amotivation, perceived-stress, academic overload and test-anxiety negatively related to Adj and AP.		•	
H1.3: Adj positively related to AP.	•		
<i>Model comparison</i>			
H2.1: A partially mediated model explains more variance than a direct or totally mediated model.	•		
H2.2: Help-seeking, intrinsic motivation, identified regulation and self-esteem have positive associations with Adj and AP.		•	
H2.3: External regulation, introjected regulation, amotivation, academic overload and perceived-stress have negative associations with Adj and AP.		•	
H2.4: Adj has a positive association with AP.	•		
<i>Model extension</i>			
H3.1: An extended model with additional constructs of self-efficacy, test-anxiety, PSS from family and PSS from friends explains more variance in Adj and AP.	•		
H3.2: Self-efficacy, PSS from family and PSS from friends have positive associations with Adj and AP.		•	
H3.3: Test-anxiety has a negative association with Adj and AP.	•		
H3.4: Adj has a positive association with AP.	•		

Table 18 continued

Hypotheses	confirmed	partially confirmed	not supported at all
<i>Moderators</i>			
H4a: Female students have higher levels of help-seeking, intrinsic motivation, perceived stress, test-anxiety, PSS from friends and AP than male students.		•	
H4a2: Male students have higher levels of extrinsic motivation and amotivation than female students.			•
H4a3: No gender difference for constructs of self-esteem, self-efficacy and PSS from family.	•		
H4a4: Introjected regulation predicts male students Adj, self-esteem predicts female students Adj, perceived stress an important predictor for both but more important for male students.			•
H4a5: Identified regulation, self-esteem, academic overload and Adj are important predictors for male students AP; amotivation is an important predictor for female students AP; test-anxiety is an important predictor for all, but more important for male students AP.			•
H4a6: Gender does not moderate the path between intrinsic motivation and AP and between self-efficacy and AP.	•		
H4b1: Older students have higher levels of intrinsic motivation, self-efficacy and AP than younger students.			•
H4b2: Younger students have higher levels of extrinsic motivation, perceived stress and social adjustment than older students.		•	
H4b3: No age differences for constructs of academic adjustment, PSS from family and PSS from friends.		•	
H4b4: Self-efficacy is an important predictor for older students AP.			•
H4c1: Students staying in university residences perform better academically and are better adjusted socially than students staying off campus.		•	
H4c2: No residence status differences for constructs of self-esteem, perceived-stress, self-efficacy, PSS from family and PSS from friends.		•	
H4c3: Tentative prediction of students' residence status to function as a moderator.		•	
Note: Adj = Adjustment to university; AP = academic performance; PSS from friends = perceived social support from friends; PSS from family = perceived social support from family			

Chapter V: Discussion

In the final chapter the results of the present study are discussed and placed into context with previous research. It details the aims of the present study; as well as summarizes the major findings and contributions to the understanding of students' adjustment and academic performance at university. Thereafter, each contribution and its implication are discussed in detail, demonstrating how significant psychosocial factors can impact and influence students at university. Here, based on the results of the present study and previous discourse in the literature; recommendations are advocated for university personnel to assist, support and help students to better adjust to university and to be more successful at university. Thereafter limitations of the present study are outlined. Finally, recommendations for future research are addressed.

5.1 Research aims of the present study

The paucity of local research addressing psychosocial variables and their role towards explaining students' adjustment and academic performance at university was the main motivation in conducting the present study. This study should be viewed as a step in the right direction; advancing and extending our current knowledge and understanding, in particular with a focus on historically disadvantaged students. The overall purpose of the present study was to identify (as well as to explore) if certain psychosocial variables predict historically disadvantaged students' adjustment and academic performance at university. Path analysis was applied to test different theoretical models; determining which model is most appropriate for students enrolled in higher education. Besides establishing the direct and indirect effect psychosocial variables had on adjustment and academic performance, the present study also examined the possibility of group differences among the psychosocial variables. A further

integral part of this study was to refine and extend an earlier model based on psychosocial variables to better explain and predict students' adjustment and academic performance at university.

In summary then, this study had four distinctive aims. The first aim was to understand the relationships between the independent variables of help-seeking, intrinsic motivation, extrinsic motivation, amotivation, self-esteem, academic overload, perceived stress, test-anxiety, self-efficacy, perceived social support from friends and perceived social support from family members, the mediator variable of adjustment and the dependent variable of academic performance.

The second aim was to test and replicate the Petersen et al. (2009) model which proposes that the psychosocial factors of help-seeking, intrinsic motivation, external regulation, introjected regulation, identified regulation, amotivation, self-esteem, perceived stress and academic overload predict students' adjustment and academic performance. Specifically, the aim was to demonstrate and establish if the partially mediated model will be better suited to explain students' adjustment and academic performance at university than a model assuming only direct relationships or a totally mediated model. An additional aim was to determine whether the psychosocial variables of help-seeking, intrinsic motivation, identified regulation, and self-esteem are positively associated with adjustment and academic performance; and whether the psychosocial factors of external regulation, introjected regulation, amotivation, academic overload and perceived stress are negatively related to adjustment and academic performance. Furthermore, adjustment was expected to have a positive association with academic performance.

The third aim was to test the assumption that an extended model with additional psychosocial variables would improve the suggested model by Petersen et al. (2009) by explaining more of the variance of adjustment and academic performance at university. It was

assumed that the inclusion of the factors self-efficacy, perceived social support from friends and perceived social support from family members positively predict student adjustment and academic performance; while test-anxiety negatively predicts adjustment and academic performance.

The fourth aim was to test for possible moderator effects impacting on the relationships among the psychosocial variables, mediator variable and dependent variable. Specifically, the first step here was to determine if there are significant differences between a) male and female students, b) younger (17 – 20 years of age) and older (21 years of age and above) students and c) students living on campus and off campus during the academic year among the independent, mediating and dependent variables. The second step was to test if a) gender, b) age or c) residence status functioned as a moderator variable for the extended model, as previous research indicated that paths differences exist between some of the psychosocial variables and adjustment and academic performance across demographic characteristics. As research has shown that demographic differences occur among some of the psychosocial variables included in this study; it was assumed that there will also be differences among the variables for historically disadvantaged students, as well as path differences in the extended model.

Before discussing the results in more detail, the major research findings of the present study are presented. This is followed by a brief summary of all contributions the present study made to the literature on students adjustment and academic performance at university.

5.2 Major findings of the present study

This study supports previous research which showed that a number of psychosocial variables are associated to students' adjustment and academic performance at university. Furthermore, this study demonstrated and added further empirical support to the theoretical

assumption that psychosocial variables function as predictor variables for students' academic success at university, to both adjustment and academic performance. The psychosocial variables of help-seeking, intrinsic motivation and self-esteem predicted positively on students' adjustment to university; while the level of perceived stress and test-anxiety impacted negatively on students' adjustment to university. This means that having a positive attitude towards seeking help at university, being intrinsically motivated to study and learn at university, and having a positive self-image and self-belief leads to better adjustment to university. Similarly, students feeling stressed about academic demands and requirements and daily life routines; as well as constantly worrying about academic tasks and fear of failing academically, leads to being less adjusted towards university. These results are in line with the Petersen et al. (2009) study, replicating the findings for intrinsic motivation, self-esteem and perceived stress. However, Petersen et al. (2009) did not find statistically significant evidence for the hypothesized role of academic support (help-seeking), which the authors attributed to methodological issues. In contrast to the present study, Petersen et al. (2009) found support for identified regulation (positively) and academic overload (negatively) influencing student adjustment to university. The lack of a significant relationship between identified regulation and adjustment in the present study is similar to a study conducted by Baker (2004) who found no support for a relationship between extrinsic motivation and adjustment. Baker (2004) reasoned that students' high levels for amotivation and overall low levels for extrinsic motivation contributed to the results; and that cognitive evaluation theory (motivation is influenced by a student's level of autonomy) may explain the high levels for amotivation. Although this may also explain students' exhibited high scores for intrinsic and extrinsic motivation and low scores for amotivation for the present study; it does not explain the lack of a relationship. A possible explanation may be that extrinsic motivations only

impact students on a personal level and may not be attributed to or effect their personal well-being or perception of the university environment.

Even though academic overload was a significant predictor of students' academic performance in the present study, it did not predict their adjustment to university, as in the study conducted by Petersen et al. (2009). This may suggest that (at least for the present study sample) academic overload is a more salient predictor and directly related to students' academic performance; and not associated with their adjustment to university. Thus feelings of being overworked, experiencing difficulties or being unable to cope with the academic demands leads directly to lower student performance potential.

The psychosocial variable of self-efficacy positively predicted students' academic performance at university; while the psychosocial variables of academic overload, amotivation and perceived stress negatively predicted students' academic performance at university. The demonstrated finding for self-efficacy indicated that students who are confident about their academic skills and abilities perform better academically. The results for academic overload and amotivation replicated the findings of Petersen et al. (2009), that students, who perceive the academic requirements at university to be very demanding in that they are unable to deal with and manage the academic workload, tend to achieve lower academic grades at the end of the academic year. The results of the present study also indicated that students who feel bored (amotivation) as well as those who are experiencing high stress levels show lower academic grades. These results were expected and confirmed the results of previous studies (e.g., Akgun & Ciarrochi, 2003; Coetzee, 2011; Fenollar et al., 2007; Petersen et al., 2009; Talib & Sansgiry, 2011; Zajacova et al., 2005). The demonstrated effect of test-anxiety on academic performance shows that students who worry about examinations and evaluations, who feel nervous, anxious and under pressure to achieve and meet expectations, perform less well academically. Petersen et al. (2009), moreover, found

support that extrinsic regulation – a form of extrinsic motivation (because of external rewards or to avoid punishment) – negatively impacts on students’ academic performance at university. No support was found in the present study. The lack of this finding is however in accordance with results from Baker (2004) and Richardson et al. meta-analysis (2012) who indicated no significant relationship between extrinsic motivation and academic performance. Students’ extrinsic motivations do not seem to play a role or influence how they perform academically at university (i.e., being extrinsically motivated does not necessarily lead to higher academic performance). Alternative psychosocial factors as well as other additional factors (e.g., economic factors) might be more predominant in students’ lives and guide their behaviour at university.

The present study further demonstrated and replicated, that a partially mediated model predicting academic adjustment and performance is more appropriate, compared to either a direct or a mediated model. In summary, the psychosocial variables of the partially mediated model explained 26% of the variance in students’ adjustment and 29% of the variance in students’ academic performance at university.

In addition, results of the present study confirmed that the model extension, assuming partial mediation, explains significantly more of the variance of adjustment and academic performance than the original model proposed by Petersen et al. (2009). In the extended model the variance increased from 26% to 30% for adjustment and from 28% to 32% for academic performance. This implies that the extended model which included the additional variables of self-efficacy, test-anxiety and perceived social support, improved the explanation of students’ adjustment and academic performance at university.

The present study was the first study to replicate the proposed model by Petersen et al. (2009) by explaining adjustment and academic performance among historically disadvantaged students at another institution. Additionally, it was the first study to test an

extended model with additional psychosocial variables. Results of the present study showed support for the validity of partially mediated models, both for the baseline model and extended model. Thus, current theory related to students adjustment and academic performance in a local context needs to or should consider both direct and indirect effects of psychosocial variables for students' academic success.

As a final point, a number of demographic differences in psychosocial variables and some path differences were identified, testing the effect of three moderator variables. The majority of variables, as well as paths between independent variables and mediator variable and dependent variable, however, showed no differences. Demographic differences among psychosocial variables predicting adjustment and/or academic performance have rarely been assessed in local research. Also, path differences among demographic moderator variables, in research related to students' adjustment and academic performance at university; has rarely been conducted or reported, even in international research. This indicates the need for more research to be conducted, focusing on the possible impact moderator variables might have, to extend current knowledge and understanding of students' adjustment and academic performance at university.

In summary, the present study made the subsequent contributions to the understanding of students' adjustment and academic performance at university, which are discussed in more detail in the next section:

1. Psychosocial variables were related to students' adjustment and academic performance at university which could be demonstrated for the South African context and among historically disadvantaged students.

- a) The variables of help seeking, self-esteem and self-efficacy were positively related to adjustment and academic performance. The findings for help-seeking (e.g., Richardson et al., 2012; Van Overwalle, 1989), self-esteem (e.g., Crede & Niehorster, 2012; Grant-Vallone et

al., 2003-2004; Marsh et al., 2005; Richardson et al., 2012; Tice & Gailliot, 2006; Whitesell et al., 2009) and self-efficacy (e.g., Byars-Winston et al., 2010; Crede & Niehorster, 2012; Fenollar et al., 2007; Klomegah, 2007; Lent et al., 2009; Ramos-Sanchez & Nichols, 2007; Richardson et al., 2012; Zajacova et al., 2005) were in line with previous research.

b) The variables of intrinsic motivation, identified regulation and perceived social support from friends were only positively related to adjustment. The findings with regard to adjustment were similar to earlier research (e.g., Baker, 2004; Crede & Niehorster, 2012; Friedlander et al., 2007; Hertel, 2002; Petersen et al., 2009; Tao et al., 2000).

c) The variable of adjustment had a positive relationship with academic performance. This applied to all four adjustment variables (i.e., academic, social, personal and emotional, institutional attachment). Results for a positive relationship between adjustment and academic performance are in line with previous research (e.g., Abdullah et al., 2009; Baker & Siryk, 1984a, 1984b; Beyers & Goossens, 2002; Crede & Niehorster, 2012; Napoli & Wortman, 1998; Petersen et al., 2009; Sennett et al., 2003; Sommer & Dumont, 2011; Wintre & Bowers, 2007; Wintre & Yaffe, 2000).

d) The variables of amotivation, academic overload, perceived stress and test anxiety were negatively related to adjustment and academic performance; confirming earlier research studies with psychosocial variables and adjustment and academic performance (e.g., Baker, 2004; Chambel & Curral, 2005; Chapell et al., 2005; Chow, 2007; Crede & Niehorster, 2012; Dyson & Renk, 2006; Faleye, 2010; Greer & Chwalisz, 2007; Hackett et al., 1992; Hembree, 1988; Neville et al., 2004; Petersen et al., 2009; Putwain, 2007; Rezazadeh & Tavakoli, 2009; Richardson et al., 2012; Seipp, 1991; Talib & Sansgiry, 2011).

2. Psychosocial variables predicted students' adjustment and academic performance at university. Psychosocial variables had both direct and indirect effects and explained academic

performance at university to a similar extent as previous high school performance (see for example studies by, Burton & Ramist, 2001; Robbins et al., 2004; Trapmann et al., 2007).

- a) The partially mediated model displayed the best model fit to the data; explaining significantly more of the variance in students' adjustment and academic performance at university than both the direct model and the mediated model.
- b) The psychosocial variables of help-seeking, intrinsic motivation and self-esteem positively predicted students' adjustment to university; while the psychosocial variable of perceived stress negatively predicted students' adjustment to university.
- c) The psychosocial variable of adjustment positively predicted students' academic performance; while the psychosocial variables of amotivation, perceived stress and academic overload negatively predicted students' academic performance at university.

3. Additional psychosocial variables in an extended model increased our understanding of how and in what way students adjust to and perform academically at university.

- a) The extended model with the additional psychosocial variables of self-efficacy, test-anxiety and perceived social support from friends and family members explained significantly more of the variance in student adjustment and academic performance at university than the original (baseline) model proposed by Petersen et al. (2009).
- b) The psychosocial variables of help-seeking and intrinsic motivation positively predicted students' adjustment to university; while the psychosocial variable of perceived stress and test-anxiety negatively predicted students' adjustment to university.
- c) The psychosocial variables of adjustment and self-efficacy positively predicted students' academic performance; while the psychosocial variables of amotivation, perceived stress, academic overload and test-anxiety negatively predicted students' academic performance at university.

4. The assessment of demographic differences of psychosocial variables suggested that certain students experience higher levels of particular psychosocial variables.

a) Female students had higher levels of perceived stress than male students; while male students, on the other hand, had higher levels of academic overload than female students.

b) Younger students at university experienced higher levels in extrinsic motivation, perceived stress and test-anxiety than older students.

c) Students residing off campus during the academic year experienced higher levels of test anxiety than students staying on campus; but students residing on campus for the academic year had higher levels of self-efficacy and academic performance than students living off campus.

5. The assessment of path differences suggested that certain psychosocial variables were only predictive for some student groups' adjustment and academic performance at university.

a) No path differences were identified for gender which suggests that gender does not function as a moderator in the proposed model.

b) Two path differences were identified for age. The path between intrinsic motivation and adjustment was significant for older students, but not for younger students. The path between self-efficacy and adjustment was also significant for older students but again not for younger students.

c) Two path differences were identified for students' residence status as a moderator. The path between academic overload and adjustment was significant for students living on campus but not for students living off campus; whereas the path between self-esteem and academic performance was significant for students living off campus but not for students living on campus.

5.3 Model replication

Model replication has rarely been done in psychological research in South Africa, yet at the same time represents a critical and necessary step to advance research knowledge. The main function of model replication was to extend the understanding of students' adjustment and academic performance at university. For the results of the tested model to be applied and become meaningful on a larger scale, a theoretical model has to be repeatedly tested under similar conditions and with additional student data. Without model replication, the results may remain a statistical exercise (e.g. Kline, 2005) and may only be considered to be representative of an isolated event. This study represents the first model replication in South Africa of a proposed psychosocial model to explain historically disadvantaged students' adjustment and academic performance at university. Additional model replication needs to be conducted to further substantiate, confirm and extend current knowledge.

Results of the present study confirmed that a partially mediated model explains more of the variance in students' adjustment and academic performance than alternative models which either assumed total mediation of the psychosocial factors on academic performance via adjustment or direct effects only. In essence, results of the present study are in line with previous research (e.g., Baker, 2003, 2004; Boulter, 2002; Chambel & Curral, 2005; Crede & Niehorster, 2012; Crocker & Luthanen, 2003; Grant-Vallone et al., 2003-2004; Petersen et al., 2009; Richardson et al., 2012; Robbins et al., 2004; etc.) that psychosocial variables are important predictor variables for students' academic success at university (and an alternative or addition to the more traditionally used variable of previous academic performance at high school); as they accounted for a considerable amount of variance in students' adjustment and academic performance. Equally noteworthy, the present study adds further support to this

premise (first established by Petersen et al., 2009, 2010) for historically disadvantaged students in a South African context.

From a theoretical point of view, this study adds further support to the theoretical assumptions from Tinto (1975), Bean (1985), Cabrera et al. (1993), Sandler (1999) and Robbins et al. (2004) in explaining and predicting student academic success at university. For Tinto (1975), Bean (1985), Cabrera et al. (1993), Sandler (1999) and Bean and Eaton (2001-2002) the concepts of academic integration and social integration to university constitute a central part of their theoretical suggestions. For Robbins et al. (2004) the construct of institutional commitment is part of a number of psychosocial constructs to predict students' academic performance. The constructs of both academic and social integration, as well as institutional commitment are synonymous to the constructs of adjustment tested in the present study. As adjustment was predictive of students' academic performance, support for previous theoretical explanations was confirmed and extended.

Although the results of the explained variance may be considered to be moderate, they are consistent and in line with previous research examining the influence of psychosocial variables on students (a) adjustment and academic performance at university (e.g., Abdullah et al., 2009; Coetzee, 2011; Crede & Niehorster, 2012; Petersen et al., 2009; Richardson et al., 2012; Robbins et al., 2004; Ting & Robinson, 1998; White & Sedlacek, 1986), (b) persistence at university (e.g., Bean, 1985; Cabrera et al., 1993; Sandler, 1999; Tinto, 1975) and (c) retention at university (e.g., Robbins et al., 2004). For example, using a number of psychosocial variables, Robbins et al.'s (2004) meta-analysis explained 16.4 % of the variance in students' academic performance and 13.2% of the variance in students' retention. Richardson et al.'s (2012) meta-analysis of psychological correlates with academic performance found similar results. Among a number of different psychological models predicting academic performance, three different models based on personality constructs

explained between 5% and 7% of the variance in students' academic performance. Likewise, models based on motivational variables, self-regulatory learning strategies, or students learning approaches explained 14%, 11% and 9% of the variance in students' academic performance, respectively (Richardson et al., 2012). Combining the psychological factors of conscientiousness, effort-regulation, test-anxiety, academic self-efficacy and grade goal to form a model with important predictor variables from each previous category; resulted in explaining 20% of the variance in academic performance, which was similar to the 22% of variance explained by previous academic performance at high school (Richardson et al., 2012). Similarly, Abdullah et al. (2009) found that the four adjustment variables together explained 32% of the variance in students' academic performance.

Other studies based on the theoretical assumptions of Tinto (1975), Bean (1985) and Cabrera et al. (1993) have reported comparable (yet sometimes stronger) findings. Studies based on Tinto's student integration model, Bean's student attrition model and Cabrera's integrated model of student retention indicated that the amount of variance in academic success ranges between 13% and 47% (e.g., Al-Dossary, 2008; Bean & Metzner, 1985; Cabrera et al., 1993; Napoli & Wortman, 1998; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1980, 1983; Sweet, 1986; Terenzini & Pascarella, 1980). An adapted and extended model by Sandler (1999), based on Cabrera's integrated model of student retention, explained between 43% and 65% of the variance in students' academic success at university. These studies, however, referred to and assessed students' academic success at university as students' persistence and withdrawal decisions and did not define students' academic success at university as academic performance, as in the present study. Additionally, these studies did not focus on historically disadvantaged students at university.

The variables which have been found to be predictive of adjustment and/or academic performance of students at university are discussed in detail in the next paragraphs.

5.3.1 Predictors of adjustment

5.3.1.1 Help-seeking predicting adjustment

The finding that positive help-seeking attitudes lead to better student adjustment, suggests that academic support as university service should be accompanied by an academic climate in which help-seeking is positively attributed by the role players in order to achieve the expected positive effects. This means that students who ask clarifying questions about course content, who meet with lecturers, teaching assistants or tutors to discuss course material are better adjusted to university. This result is in line with previous research (e.g., Boulter, 2002; DeStefano et al., 2001; Grant-Vallone et al., 2003-2004). Lecturers, academic staff as well as general university personnel should be aware that when students ask for help, foremost it involves them admitting to themselves that they have a certain problem which requires assistance or guidance (e.g., problem in understanding course material, uncertainty how to conduct or write a course assignment, indecision how to carry out research, etc.). By asking for help students may well experience a reduction in their academic stress levels and feelings of being less academically overloaded - as indicated by the negative correlation between help-seeking and perceived stress and help-seeking and academic overload. For some students (e.g., introverted) initializing and carrying out the process of asking for help (e.g., approaching a lecturer) may cost them a tremendous amount of effort in order to overcome their inhibitions. Therefore, university personnel should be sensitive, receptive, open-minded and patient towards students' help-seeking requests, as well as encourage and support future requests of assistance.

Students may also be seeking help and advice for academic problems at university counselling centres; and may choose not to engage with academic staff or academic support staff involved with student support and student development programs, at least not

instantaneously. Previous research indicates that many students attend counselling services because of academic problems. At the same time, research indicates that available services on campus are often not utilized by students (e.g., Constantine et al., 2005; Friedlander, 1980; Knapp & Karabenick, 1988; Oliver et al., 1999; Raunic & Xenos, 2008; Russell et al., 2008), which has certain implications and which need to be considered. Firstly, university counselling services play a vital role in helping students to adjust to university, especially in adjusting academically to the demands, expectations and requirements of university life. Secondly, counselling centres at university have to make an (extended) effort (to inform students more about their services [e.g., familiarize students with concepts of counselling, lower perceived stigma attached to counselling]) and to ensure that their services are used more readily (and are easily accessible) by students who need their assistance.

The positive relationship between help-seeking and adjustment may also imply that, in general, students may be open to and endorse the support and developmental programs that are currently offered by universities in South Africa. Here, the university staff should ensure that students in need of assistance also attend the available programs on offer. Silverman and Juhasz (1993) for example, have shown that students who reject help for academic problems or difficulties experience low self-esteem and feel less part of the university community.

5.3.1.2 Intrinsic motivation predicting adjustment

Intrinsic motivation, in an academic sense, refers to students engaging, studying and learning because of their own interest; desire; and drive to acquire more knowledge about a particular subject/area, and because they find the experience to be stimulating, enjoyable, rewarding and/or enriching. The relationship between intrinsic motivation and adjustment suggests that higher levels of intrinsic motivation lead to better adjustment of students at university and vice versa. This result is in accordance with self-determination theory which

indicates that intrinsic motivation has a positive effect on behaviour. The latter means that students scoring high on intrinsic motivation are more likely to use a deep learning approach, to use self-initiated exploratory strategies, to be confident and in control of their studies and to display autonomy (Ames & Archer, 1988; Pintrich et al., 1991; Seifert & O’Keefe, 2001; Senecal et al., 1995). It is also in line with previous research which has found a positive relationship between intrinsic motivation and adjustment (e.g., Aspinwall & Taylor, 1992; Baker, 2004; Dennis et al., 2005; Miquelon, Vallerand, Grouzet, & Cardinal, 2005; Petersen et al., 2009; Thomas, Love, Roan-Belle, Tyler, Brown, & Garriott, 2009). This result implies that schools should administer career counselling programs as well as career workshop programs to help and assist future university students in identifying their interest for a particular career. It further implies that any future career and educational planning should foremost be based on students’ own and true interests. Stimulating students’ interests as well as indicating a wide variety of possible directions and choices available to students after completing their high school education may provide them with a better perspective of what they would like to study at university. This also implies that students as well as student advisors should carefully (and in-depth) consider what type of program and course selection is most suitable and if it reflects students’ true interests. By identifying students’ interest and preferences and through student advisors’ knowledge of program and course content, an informed decision may be reached that is beneficial for student and university alike. It is also suggested that lecturers continually and periodically update and review how their course content is presented and delivered to students – both to engage with students and to make it as interesting, appealing and stimulating as possible.

5.3.1.3 Self-esteem predicting adjustment

The results of the present study show that students with higher levels of self-esteem

are better adjusted to university. This indicates that the more confident and self-belief students have about their own abilities and skills the better (and more likely) they will positively adjust to university life. A positive self-concept may make it easier for students to participate in class discussions, to participate and engage in campus activities, to form new friendships, to ask clarifying questions about academic matters, and to interact with fellow students and lecturers on campus; thereby making it less challenging and demanding for them to adjust to university life. Students with higher levels of self-esteem may adjust better to university because they have more personal resources available to handle academic, social and personal difficulties (Friedlander et al., 2007). The findings of the present study are in accordance with previous research that high levels of self-esteem (a) positively influence student adjustment to university, (b) will lead towards setting higher individual goals (e.g., the goal to attain higher academic marks), (c) provides students with the ability to recover from failures, (d) buffers negative influences and stress thus protecting students, (e) serves as a promotive and protective factor facilitating and supporting personal growth and academic achievement and (f) similar to the present study, predicts academic adjustment of first year students to college (Aspinwall & Taylor, 1992; Boulter, 2002; Crede & Niehorster, 2012; DiPaula & Campbell, 2002; DuBois et al., 1998; Friedlander et al., 2007; Grant-Vallone et al., 2003-2004; Haynes, 1990; Mooney et al., 1991; Napoli & Wortman, 1998; Petersen et al., 2009; Tieu, Pancer, Pratt, Wintre, Birnie-Lefcovitch, Polivy, & Adams, 2010; Toews & Yazedjian, 2007; Ullman & Tatar, 2001; Whitesell et al., 2009). The positive effect of self-esteem on adjustment is also in line with research indicating self-esteem to be related to happiness, life-satisfaction, self-efficacy, deep learning approach and low levels of stress (Abouserie et al., 1994; Baumeister et al., 2003; Diener & Diener, 1995; Lane et al., 2004; Lyubomirsky et al., 2006; Pajares & Miller, 1994; Phan, 2010).

Even though previous research has consistently found a positive link between self-esteem and academic success, there still seems to be disagreement about the directionality of the relationship due to the majority of studies being correlational in nature. That is, whether high self-esteem leads towards better academic success or if higher self-esteem is a direct result of good academic performance. Because of the correlative nature of the present study the link of higher self-esteem leading to better academic performance (or vice versa) was not tested with the goal to establish causality. However, the present research suggests that the relationship between self-esteem and students' academic performance is mediated by the influence of students' adjustment to university. That is, self-esteem seemingly indirectly effects on students' academic performance through the mediating role of students' adjustment to university.

The enhancement of student self-esteem seems to be an important aspect for successful student integration. Bolstering, improving and enhancing students' self-esteem by positive reinforcement and encouragement by lecturers and counselling staff may lead to better adjustment and consequently better academic performance at university. However, 'caution' is advised and recommended here with reference to a study conducted by Forsyth, Lawrence, Burnette and Baumeister (2007). In Forsyth et al.'s (2007) field experiment among 90 (22 male and 68 female) undergraduate psychology students, the aim was to enhance the self-esteem of academically low performing students, as the researchers believed that improving and bolstering the self-esteem of low performing students would improve their academic performance. Students with relative low academic performance – that is, those receiving C, D, and F symbols in their mid-term examination were identified as the target group. Students received weekly messages for duration of six weeks to enhance their self-esteem. Results, however, showed that D and F students' academic performance declined significantly, from 58% in their mid-term examination to 38% in their final examination. C

students' academic performance did not change significantly but also declined. In contrast, D and F students in the control group that received no weekly messages to enhance their self-esteem did not change in their academic performance. As such, results showed that trying to enhance the self-esteem of especially academically low performing students leads to poorer academic performance. Increasing the self-esteem of students may lead them to adopt a negative attitude towards external requirements (Baumeister et al., 2003) or to over-estimate their academic skills and competencies and to underestimate the effort and amount of academic work and study necessary to be successful at university. As raised by the authors, it is difficult to replicate and confirm these results with students at another university as it would be unethical to conduct a study where an intervention may lead students to perform worse academically than without it. Therefore, interventions aimed at improving students' academic performance should not rest solely on improving their self-esteem and in isolation of other important variables (e.g., academic motivation, adjustment, stress, test-anxiety, self-efficacy) which have been shown to play an important role. Designing and implementing an intervention with a multitude of factors aimed at improving students' academic performance might yield different and more favourable results. Furthermore, it is suggested, when trying to improve and bolster students' self-esteem by messages of positive reinforcements and encouragement, that these messages make reference to and constantly remind students that success at university also involves and requires effort, dedication, commitment and constant studying and learning.

5.3.1.4 Perceived stress predicting adjustment

Students may experience times of higher levels of stress at university due to a number of possible reasons. For example, managing the academic workload, studying on a continuous basis to prepare for classes, effectively managing available time, examinations,

financial concerns, as well as adjusting to the demands and requirements of university life may all be possible sources of students' heightened stress levels. Especially for first year students, adjustment to university (academically, socially, personally and emotionally) can be a stressful experience as students (a) have to cope with new academic tasks and responsibilities, (b) have to maintain and manage a high academic workload (meeting deadlines, writing assignments, independent reading, preparing for classes, etc.), (c) are likely to be away from home for the first time in an unfamiliar environment, lacking the familiar support networks from friends and family members, and (d) have to establish new social and academic relationships / friendships, thereby creating an new social and academic supportive network. Harrell, Myers and Smedley (1993) referred to these stressors as 'role strain' which all students attending university might experience and which may negatively influence student adjustment at university.

The present study found that lower levels of stress lead students to be better adjusted to university, which was in accordance with previous research (e.g., Coffman & Gilligan, 2002-2003; Crede & Niehorster, 2012; Demakis & McAdams, 1994; Friedlander et al., 2007; Gall et al., 2000; Greer & Chwalisz, 2007; Malefo, 2000; Petersen et al., 2009; Tieu et al., 2010). For example, Coffman and Gilligan (2002-2003) and Demakis and McAdams (1994) indicated that the more students perceived stress, the more negative their life satisfaction was. The influence of students perceived stress on their adjustment to university shows that students who are in control of their daily study, learning and life routines and who assess their lives as foreseeable and manageable succeed in adjusting to university.

In order to reduce the amount of stress students experience while at university; or to help them to cope better with the stress and to facilitate better adjustment to university, it may be advisable to offer and teach students coping strategies – both on an individual level and in general stress management programs to help students with the daily demands and tasks of

university life. Further ways to alleviate stress and facilitate adjustment to university may be accomplished by teaching time management skills (how to effectively manage time, to make priorities, to find a right balance between work and play), as well as learning and study techniques in workshops or programs so that students are better equipped to meet deadlines, to prepare for examinations and to reduce academic stress. Furthermore, an effort should be made to enhance and improve student social support networks, as previous research has shown that it buffers the influence of stress (e.g., encouraging students to participate in sport activities or social activities on campus thereby building a supportive network of friends). Offering a broad spectrum of possible student activities, as well as implementing regular contests and competitions among different student/staff teams (i.e., in sport activities) and against other universities may further increase participation and interest. Also, regular interaction with academic staff (both on an academic and social level) may reduce the amount of perceived academic stress for students and enhance their adjustment to university. One possible strategy to implement and enhance student-staff interaction may be to make it a compulsory course requirement and thereby a shared responsibility for both parties. Student attendance and interaction may be rewarded with course credit. Participating academic staff may be rewarded with additional funding for their research projects or extended leave days. Enhancement of and in-depth delivery of orientation programs to familiarize students with academic support services might be another approach to reduce students stress levels, because often, students do not know where to turn for help and assistance (Bojuwoye, 2002). Making students feel welcomed by the university might create a friendly and supportive atmosphere that may reduce some stress students experience.

5.3.2 Predictors of academic performance

5.3.2.1 *Academic overload predicting academic performance*

The results of the present study indicated that academic overload leads to lower academic performance of students at university. This means that students who feel overwhelmed by their daily academic requirements and responsibilities will receive lower academic grades. As students struggle to comply with academic requirements, have difficulties to meet deadlines for assignments, feel overwhelmed by attending lectures and tutorials on a regular basis, their ability to perform well academically declines. This result is in accordance with previous research by Bitzer and Troskie-De Bruin (2004), Chambel and Curral (2005) and Petersen et al. (2009). As mentioned earlier, teaching at university moves along at a far more rapid pace than at high school and demands and expects basic competencies in math, English and literature, as well as disciplined independent learning. Students need to devote more time towards studying at university than at high school to be successful. Additionally, students have to develop new learning routines and learning skills at university (Parker et al., 2004). Students, especially first-year students, may well underestimate the amount of time required for independent learning, reading, course preparation and working on assignments; and/or also overestimate their academic abilities and skills. As a result they may be feeling overloaded by the constant academic tasks and responsibilities.

Historically disadvantaged students might be especially susceptible to academic overload due to their lack of adequate academic preparation and poor high school education (Du Pre, 2003; Holder et al., 1999; Nair et al., 2005; Scott et al., 2007; Yeld et al., 2004). Furthermore, the teaching language of English is also likely not to be their mother tongue (e.g., Jones et al., 2008; Naidoo, 2008) making it more difficult and demanding to comprehend and absorb the academic material than it is for historically advantaged students. Additionally, time management and study skills that are needed to cope with and manage the

academic workload might be less present or less developed in historically disadvantaged students.

It is suggested that students carefully consider which academic and non-academic (social or extra-curricular) activities to participate in; as the academic workload with its requirements and responsibilities can be an overwhelming task to master, especially for first year students, who not only have to adjust to academic requirements, but also socially and personally. Students should be advised to plan their academic activities and to develop study routines, to set realistic study goals and to set priorities, and to learn and adopt time management skills and study skills. The university can provide support and assistance for its students by offering and teaching appropriate time management skills, study skills and coping skills to reduce and combat student academic overload.

5.3.2.2 Amotivation predicting academic performance

Amotivation is characterized by the absence of both intrinsic motivation and extrinsic motivation. Students displaying high levels of amotivation at university lack the desire and motivation to do well because they believe their actions are not going to make a difference and because they believe events or circumstances are caused by factors beyond their control (Coakley & White, 1992; Cokley et al., 2001). The finding between amotivation and academic performance has shown that higher levels of amotivation lead to lower academic performance of students at university. This result is in line with previous research (e.g., Coetzee, 2011; Davy et al., 2009; Keleş, 2012; Petersen et al., 2009; Smith, Davy, & Rosenberg, 2009; Turner, Chandler, & Heffer, 2009; Vanthournout, Gijbels, Coertjens, Donche, & Van Petegem, 2012); and also in accordance with self-determination theory which indicates that amotivation has a negative effect on behaviour.

It is suggested that an effort is made to decrease students' levels of amotivation and to encourage and increase students' intrinsic motivation, as well as the more self-determined form of extrinsic motivation, that is to say, identified regulation. Academic staff members should familiarize themselves with the different types of motivation and how they influence academic performance in order to assist and encourage students at university. By informing themselves and their colleagues, different strategies could be developed, tested and applied on how to encourage more positive behaviour or on how to change students' attitudes to stimulate their interest and thinking, thereby leading to a better university experience and better academic performance.

5.3.2.3 Perceived stress directly and indirectly predicting academic performance

The present study found that higher levels of stress lead to lower academic performance of students at university. This result was in accordance with previous research (e.g., Akgun & Ciarrochi, 2003; Blumberg & Flaherty, 1985; Chow, 2007; Clark & Rieker, 1986; Felsten & Wilcox, 1992; Hackett et al., 1992; Linn & Zeppa, 1984; Neville et al., 2004; Pritchard & Wilson, 2003; Richardson et al., 2012; Struthers et al., 2000; Talib & Sansgiry, 2011). This implies that students who are having difficulties coping with their academic requirements and tasks, and who find their academic responsibilities difficult to manage or overwhelming are experiencing increased levels of perceived stress which negatively influences performance capabilities, resulting in lower academic achievement at university.

Research on student stress at university suggests that their stress is highest at the beginning of the academic year and shortly before examinations start. Abouserie (1994) argues that it is not the examinations themselves that are causing higher stress for students, but rather that students' knowledge of having to take a number of examinations is the source of their elevated stress levels. That is, academic stress may be caused by the fear of failure,

by the perception of tests, assignments and academic work being extremely difficult, by the self-perception and self-evaluation of being ill-prepared, or by the pressure and expectations of others (e.g., family members) to do well at university.

It may be argued that some students experience higher stress or are unable to effectively deal with the experienced stress or adapt to a stressful event/situation because of insufficient coping resources, poor time-management skills or poor study techniques. Struthers et al. (2000) for example, found that problem-focused coping (PFC) mediates the relationship between student stress, motivation and academic performance. PFC refers to students' thoughts, actions and strategies which are initiated to reduce a stressful situation and are applied when students believe they can change or influence a particular situation (Struthers et al., 2000). Students high in PFC techniques/skills were more motivated and performed better academically in Struthers et al.'s (2000) study. Similarly, Akgun and Ciarrochi (2003) indicated that students' learned resourcefulness (LR) moderates the relationship between stress and academic performance. According to Akgun and Ciarrochi (2003) LR "is defined as a set of skills for regulating internal events such as emotions that might otherwise interfere with the smooth execution of a target behaviour" (p. 287). Students high on LR were not as affected or influenced by high levels of stress as students with low levels of LR (resulting in lower academic performance) (Akgun & Ciarrochi, 2003). Hence, students high on PFC and LR are better prepared to cope with the experienced stress at university. Thus effectively teaching and training coping skills/strategies to students (time-management skills, study and learning skills, self-control skills, etc.) appears to be beneficial to students, helping them to manage and reduce the amount of stress experienced.

In addition to offering interventions or student programs based on providing coping skills, research also suggests alternatives for reducing students stress. Campbell, Svenson and Jarvis (1992) for instance, advocate that sport and extracurricular activities may assist

students in moderating or reducing experienced stress at university. Deckro et al. (2002) found that teaching cognitive behavioural skills and relaxation techniques to students (consisting of six 90 minute sessions) considerably lowers their perceived stress levels, anxiety and psychological distress.

A relatively new strategy to relieve students' academic stress – especially during the end of the academic year, which may seem rather unorthodox initially, was to provide students with the possibility and opportunity to play or spend time with puppies or certified therapy dogs on campus. What started at one university in the USA is now quite widespread among different campuses (e.g., University of California, Indiana University, Emory University, Harvard Medical School, etc.) and has also been tried at Canadian Universities (e.g., University of Ottawa, Dalhousie University) (Goldman, 2012; Wallace, 2012). The type of support offered for students (may) differ from institution to institution, ranging from staff members bringing their own pets along on certain days, residences allowing students to bring their pets along from home, rent a puppy for a day, a puppy room during exams time, or the permanent addition of a puppy room or therapy dog to a university counselling centre (Goldman, 2012; Wallace, 2012). According to feedback from staff and students, the initiatives and programs have been very popular and well received (Goldman, 2012; Wallace, 2012). Initiating a similar program (to test its effectiveness) at a historically disadvantaged university may be another valuable attempt to assist and help reduce student stress levels at university, especially during year end examinations. As current interventions, support and development programs leave rather a lot of room for improvement, as reflected in poor retention and graduation rates of students in South Africa, it may be time to be more creative and inventive.

5.3.3 Adjustment predicts academic performance

Academic performance was significantly predicted by positive adjustment to university. This finding was expected, and confirmed earlier research with similar results showing that adjustment is a key predictor for students' academic performance at university (e.g., Abdullah et al., 2009; Baker & Siryk, 1984a, 1984b; Beyers & Goossens, 2002; Crede & Niehorster, 2012; Napoli & Wortman, 1998; Petersen et al., 2009; Sennett et al., 2003; Wintre & Bowers, 2007; Wintre & Yaffe, 2000). This implies that students who are well-adjusted to the academic, social and personal/emotional demands of the university; who are able to form new social networks and establish friendships; who are comfortable in their surrounding environment and who feel a sense of belonging and part of the university community achieve higher academic grades. That is, good adjustment to university is of vital and central importance for academic success, especially for historically disadvantaged students. As pointed out earlier, historically disadvantaged students are foremost first-generation students, and are likely to experience more difficulty adjusting to university than historically advantaged or second-generation students (e.g., Kagee et al., 1997; Orozco, 1995; Hertel, 2002). Historically disadvantaged students in South Africa are confronted with additional obstacles that are not necessarily experienced by traditionally more advantaged students. The additional challenges make their adjustment process and transition from high school to university even more difficult to master. This may include financial problems (e.g., DHET, 2010; Jansen et al., 2007; Jones et al., 2008; Scott et al., 2007), language problems (e.g., Jones et al., 2008; Naidoo, 2008), a new educational system (e.g., CHE, 2010; Jones et al., 2008), having to adjust from a rural to an urban environment (e.g., Miller et al., 1998; Sennett et al., 2003), and a lack of high academic skills as a result of poor education, schooling and university preparation by the high school system (e.g., Du Pre, 2003; Holder et al., 1999; Nair et al., 2005; Scott et al., 2007; Yeld et al., 2004).

The present study also demonstrated that all four adjustment variables were related to students' academic performance at university. This was in line with previous research which also supported the theoretical multidimensionality of adjustment when predicting academic performance (Baker & Siryk, 1984a, 1986; Crede & Niehorster, 2012). As pointed out by Crede and Niehorster (2012), the correlations between the different adjustment variables are high, but not too high to suggest redundancy or forming of composite variables. This suggests that all four adjustment variables should be applied together when using the SACQ to assess students' adjustment and academic performance at university.

It is noted however, that this research is in contrast to studies conducted by Petersen et al. (2009), Abdullah et al. (2009) and Taylor and Pastor (2007). Although Petersen et al. (2009) showed adjustment to be predictive of academic performance, only academic adjustment, personal/emotional adjustment and institutional attachment were found to be related to academic performance. No support was found for the variable of social adjustment. This difference may have resulted by studying historically disadvantaged students at an advantaged university rather than at a historically disadvantaged university which represent the majority of students in South Africa. Historically disadvantaged universities still lack some of the quality in resources and opportunities they can offer to students compared to historically advantaged universities. As a direct result, social adjustment may be markedly more important for students' academic success at historically disadvantaged universities. The need to feel and be part of the university community on a social level with students and staff and involvement in social activities may be higher and more important for them. That is, the social experience at a historically disadvantaged university may be different for historically disadvantaged students to that experienced at a historically advantaged university. Similarly, Abdullah et al. (2009) indicated that academic adjustment and personal/emotional adjustment predicted academic performance, but not social adjustment and institutional attachment.

Additionally, Taylor and Pastor (2007), by analysing the construct validity of the SACQ revealed a lack of fit of the four-factor model suggested by Baker and Siryk, advocating the scale be revised and the theory related to the different adjustment variables closely examined. However, the SACQ has been widely used and accepted in educational research; and the study by Taylor and Pastor (2007) has been the only study to date which has evaluated the four-factor model.

As indicated by previous research and supported by the present study, adjustment plays an important role in students' academic performance (e.g., Abdullah et al., 2009; Crede & Niehorster, 2012; Napoli & Wortman, 1998; Petersen et al., 2009, 2010; Sommer & Dumont, 2011; Wintre & Bowers, 2007; Wintre & Yaffe, 2000). It is therefore important to enhance, support, and increase students adjustment at university to improve their academic performance, likelihood of student retention and to reduce student dropout. Research provides a number of suggestions on how this may be accomplished.

Firstly, students should be encouraged to participate and be actively involved in extracurricular activities on campus – that is activities beyond and besides their attendance of lectures, tutorials and practicals. These activities have shown to increase and result in better adjustment of students (Tieu & Pancer, 2009). Research suggests that the extracurricular activities (e.g., study groups, sport activities, residence activities, etc.) should not be so much high in quantity, but rather high in quality (relevant and important from students perspective - with the aim of developing or enhancing specific abilities), structured (have clear rules and goals together with regular student attendance) and be supervised (Mahoney & Cairns, 1997; Mahoney, Cairns, & Farmer, 2003; Mahoney & Stattin, 2000; Tieu et al., 2010) in order to have a positive effect on students adjustment to university. For example, Tieu et al. (2010), found that among 474 first year Canadian students, activity structure and quality was positively related to students' self-esteem, social support and adjustment to university, and

negatively related to students' perceived stress. Activity structure predicted students' initial adjustment (in November 2005), but not at a second assessment point four months later; yet students' initial adjustment was predictive of their later adjustment to university (Tieu et al., 2010). It is suggested that Tieu et al's. (2010) tested concepts of quality, structure and supervision may apply locally as well and will have importance for enhancing and reviewing current interventions, development and student support programs in place at South African universities.

Secondly, DeStefano et al. (2001) indicated that students having problems with adjusting to university life benefit from interventions based on counselling.

Thirdly, Hurtado, Carter and Spuler (1996) showed that senior students (referred to by Hurtado et al. as upper-class students) can positively influence first year students' social adjustment and attachment to university. It is therefore suggested to actively involve and place senior and graduate students in vital positions around the campus to act as student advisors (e.g., as advisors in student centres, as a contact person to go to at the counselling centre, as advisors during registration and course selection, as advisors in students residences, etc.). Hurtado et al's. (1996) study also found that academic counsellors positively influenced students' academic adjustment and attachment to university. Hence academic counsellors should not only be informed of the vital role they play in helping students adjust to university, but more resources should be made available to counselling centres and students services to enable them to increase their efforts. Hurtado et al. (1996) further indicated that students found fellow students and residence staff (38.2%) and family members (27.6%) most influential in helping them adjust to university, with only 10.6% of students citing administration and academic staff as helpful in their adjustment. This suggests that family members play a vital role in students' adjustment. Hence, family members should be made aware of the difficulties and problems new students might face in order to be even better

prepared and to offer even better support and advice. This may apply especially to family members of historically disadvantaged students, as they are unlikely to have attended university previously, and as such cannot draw from previous experience, and thus might especially benefit from being made aware of potential challenges and difficulties. Although Hurtado et al's. (1996) study only included Latin American students and did not define the term of upper-class students (it is unclear whether this term refers to 3rd and/or 4th year or graduate students) it is suggested that their findings may also be helpful in enhancing students adjustment to university in a local context.

Fourth, and related to the findings from Hurtado et al. (1996), is the concept of assigning a senior student or academic staff member to first year students at university (e.g., Good, Halpin, & Halpin, 2002; Lotkowski et al., 2004) who guide the student by either tutoring or mentoring him/her.

Fifth, it is suggested that students' adjustment levels are assessed or monitored to recognize students with adjustment difficulties. Here the SACQ might be used as a screening tool or be part of an early warning system identifying students with adjustment and academic problems. Identified students might then be placed or advised to participate in relevant intervention and support programs. This suggestion is similar to Crede and Niehorster (2012) who advocated that student's adjustment levels to university should be identified in a similar fashion as identifying students at risk of low academic performance. The suitability of the SACQ as a screening tool has been demonstrated by, for example, Krotseng (1992) among 2000 first year students at the University of Hatford. In Krotseng's (1992) study, the SACQ was found to accurately predict and discriminate among students likely to stay or leave the university; correctly predicting 79% of student persisters and 85% of student non-persisters. When used in conjunction with academic performance marks, the predictability of the SACQ was significantly increased, sometimes reaching 100%.

Sixth, a number of researchers advocate the use of coping strategies to enhance students' adjustment to and academic performance at university (e.g., Abdullah, Elias, Uli, & Mahyuddin, 2010; Aspinwall & Taylor, 1992; Hackett et al., 1992; Sennett et al., 2003; Wintre & Yaffe, 2000). For example, Abdullah et al. (2010) found that the coping strategies of planned problem solving and positive reappraisal lead to better student adjustment, while the coping strategies of seeking social support and confrontive coping lead to better academic performance among 250 first year Malaysian university students.

However, it is important to bear in mind that students in need of assistance often do not utilize the help that is available on campus (e.g., Constantine et al., 2005; Knapp & Karabenick, 1988; Friedlander, 1980; Oliver et al., 1999; Raunic & Xenos, 2008; Russell et al., 2008). As a result, interventions or support programs might only be attended or considered by students with severe problems or difficulties and therefore do not reach all students (e.g., Deckro et al., 2002); although all (or more) students might benefit from it, and not only academically low-achieving students or students facing personal and/or social difficulties. Hence, the positive influence and effect intervention, support and development programs may have on students overall well-being, adjustment to university and academic performance (e.g., Boulter, 2002; DeStefano et al., 2001; Grant-Vallone et al., 2003-2004) should be communicated to students (e.g., through extensive advertising on campus, by lecturers, by counsellors) or may even need to become a prerequisite if students are found to be struggling academically or facing adjustment problems. Likewise, the availability of these services should be communicated to students at the earliest possibility (e.g., during orientation or registration) so that stress or other negative factors (e.g., academic overload, anxiety, depression) can be dealt with before it becomes more severe and entrenched in students' lives. It follows that students should be made aware of and encouraged to seek help and support sooner rather than later when facing difficulties at university.

5.3.4 Statistically non-significant relationship for extrinsic motivation

Although most of the psychosocial variables were found to be predictive of either adjustment or academic performance or both, the present study showed no support for the negative relationship of all extrinsic motivation variables to adjustment and academic performance (i.e., extrinsic regulation, introjected regulation, identified regulation). This was in contrast to research which has indicated extrinsic motivation to be positively related to adjustment and academic performance (Chowdhury & Shahabuddin, 2007; Conti, 2000; Goodman et al., 2011; Petersen et al., 2009 [for identified regulation]); or negatively related to academic performance (Kaufman, Agars, & Lopez-Wagner, 2008; Petersen et al., 2009 [for extrinsic regulation]). Rather, results of the present study are in line with a number of studies which also found a lack of support for extrinsic motivation impacting on adjustment or academic performance (e.g., Baker, 2003, 2004; Davy et al., 2009; Reynolds & Weigand, 2010; Richardson et al., 2012). Locally, a research study conducted by Coetzee (2011) among 190 first to fourth year students at the University of the Free State to assess the relationships between academic self-concept, motivation and academic performance, also showed no significant relationship between extrinsic motivation and academic performance. This applied to students from all study years. As mentioned earlier, Richardson et al.'s (2012) recent meta-analysis, which also included ten studies examining the relationship between extrinsic motivation and academic performance, indicated no significant relationship between the two variables.

This may indicate that intrinsic motivation and amotivation (both significant predictors in the present study) as well as other variables of the present study are more important variables for students' adjustment and academic performance than extrinsic motivation. With regard to the present study, it was assumed that historically disadvantaged

students would be motivated extrinsically (by external rewards like a high paying job, social status, recognition by others, earning a high income to support their families, etc.) - and that this would positively influence their performance. No evidence was found for this premise. This may have been a methodological issue, considering the rather low scale reliability for the motivation sub-scales of external regulation and identified regulation. Also, the influence extrinsic motivation might have on academic performance may be over-rated, as indicated by the results of Richardson et al's (2012) recent meta-analysis, which found no relationship. Furthermore, extrinsically motivated students may be influenced by other factors as well which are counterproductive to both their external motivations and academic performance. These possible factors may include and range from, for example, a lack of interest in a chosen degree major, overestimating their academic abilities, lack of commitment and dedication to study or to poor, difficult or inadequate living conditions at university residences.

5.4 Implications for model extension

Aside from the theoretical support this study provides for the concepts of integration, commitment or attachment (i.e., adjustment to university) to predict students' academic success at university, the individual construct of self-efficacy of the model extension further expands this support. For example, the construct of self-efficacy was an integral part of Bean and Eaton's psychological model of student retention, a part of Sandler's (1999) model of student integration and persistence and part of Robbins et al.'s (2004) study (model) to predict student academic performance at university. The present study confirmed the theoretical positive influence of self-efficacy on students' success by positively predicting their academic performance. The effect of test-anxiety on students' adjustment and academic performance at university found in the present study was in line with the majority of previous research results. Although the construct of perceived social support (thought to tap into

Bean's psychosocial factors of alienation and social life) was not predictive of students adjustment and academic performance, it is reasoned that alternative measures of perceived social support (e.g., from friends on campus, from university lecturers) might be indicative of the hypothesized positive relationships.

5.4.1 Self-efficacy predicts academic performance

The results of the present study show that higher levels of self-efficacy lead to better academic performance of students at university. This means that students who feel confident about their skills, who are confident about their academic and learning capabilities and who have a positive attitude or perception towards their abilities will perform better academically and receive higher academic grades. Hence students who are self-confident, self-reliant and who view themselves as more competent in academic tasks might be better prepared to cope with challenges or difficulties at university and will believe that obstacles can be managed and overcome, and as a result perform better academically. This result is in accordance with previous research which has also indicated a positive relationship between students self-efficacy and academic performance (e.g., Chowdhury & Shahabuddin, 2007; Elias & Loomis, 2000; Fenollar et al., 2007; Hoover, 2003; Klomegah, 2007; Lane & Lane, 2001; Lane et al., 2004; Multon et al., 1991; Richardson et al., 2012; Vuong et al., 2010; Zajacova et al., 2005). This research is also in line with Bandura (1993) who suggests that self-efficacy leads to better academic performance because students high in self-efficacy apply their knowledge and skills and can overcome difficult academic requirements. Also, students high in self-efficacy may perform better academically and have superior skills and academic knowledge because there is a positive relationship between hours devoted towards studying and self-efficacy (Torres & Solberg, 2001). The more time students allocate towards studying, the higher their level of self-efficacy and the better their academic performance.

Pajares (1996) cautions that students' levels of self-efficacy may be ineffective and do not lead to better performance under two circumstances. He argues that although students might be confident and view themselves as highly trained and skilled in academic tasks; this will not necessarily help them if they are not motivated to achieve or succeed at university, as they are unlikely to apply their knowledge. Secondly, students' self-efficacy will not help their academic performance "[...] if schools lack the effective teachers, necessary equipment, or resources required to aid students in the adequate performance of academic tasks" (Pajares, 1996, p. 568). Hence, students high in self-efficacy benefit by increasing their motivation to do well at university, students low in self-efficacy benefit from bolstering and improving their confidence levels, and adequate resources, support services and developmental programs should be in place to support and guide all students with their academic tasks. Also, self-efficacy is a more important predictor for students with low academic performance (Multon et al., 1991), which implies that improving and fostering self-efficacy of academically low performing students is especially important.

Universities should therefore consider self-efficacy as a predictor variable of students' academic performance and contemplate the positive effects raising students levels of self-efficacy may have²¹. For instance, the usefulness and significance of improving students' self-efficacy was demonstrated by an experiment conducted among students at the East Los Angeles Community College by Barrios (1997). Students trained in enhancing their self-efficacy and learning to manage their stress levels significantly improved their academic performance; while students in the control group trained in learning skills showed a significant decline in academic performance. Also, students trained in self-efficacy and stress-management had lower dropout rates than students in the control group, 16% and 56%

²¹For other examples and suggestions on how to improve students' self-efficacy refer to Ramos-Sanchez and Nichols (2007).

respectively (Barrios, 1997). Hence, enabling students with skills in fostering and improving their self-efficacy and teaching them stress-management skills is beneficial towards their academic performance and assists universities in retaining their students, more so than empowering students with learning skills. Although improving learning skills was not found to be effective in Barrios' (1997) experiment, it is suggested that this does not discourage or devalue the importance of enabling historically disadvantaged students with good study and learning techniques (i.e., to comprehend academic material, to study effectively, to minimize academic overload, etc.). Rather, results from Barrios' (1997) experiment and the present study are foremost indicative of the importance, value, benefit and influence self-efficacy has on students' academic performance. The implication here is that the psychosocial factor of self-efficacy should receive attention and consideration.

5.4.2 Test-anxiety predicts adjustment and academic performance

The present study found that higher levels of test-anxiety are indicative of lower academic performance of students at university. This was in line with previous research (e.g., Cassady & Johnson, 2002; Chapell et al., 2005; Everson et al., 1991; Faleye, 2010; Garcia & Pintrich, 1996; Gaudry & Spielberger, 1971; Hancock, 2001; Hembree, 1988; Jing, 2007; Justice & Dornan, 2001; Putwain, 2007; Rana & Mahmood, 2010; Rezazadeh & Tavakoli, 2009; Seipp, 1991; Smith et al., 1990; Talib & Sansgiry, 2011). This result implies that students who worry about an upcoming examination and its possible negative outcome, who feel poorly prepared and nervous, who fear failure and are under pressure to do well academically, and who have difficulties concentrating and focusing on academic tasks perform less well academically.

Research suggest that test-anxiety is at its highest point at university level, with 10% of college students experiencing high test-anxiety levels and 40% of college students

experiencing moderate test-anxiety levels (Ross & Driscoll, 2006). Cassady and Johnson (2002) found that the variable of test-anxiety alone was able to predict 7%-8% of students' variance in academic performance. As academic performance is influenced by a multitude of factors, the amount of variance explained by test-anxiety is substantial. Grimes (1997) indicated that under-prepared students have higher test-anxiety levels. Hence identifying and reducing test-anxiety is especially important for university students in order to achieve an increase in academic performance. Results of the present study indicated too that test-anxiety is an important factor to consider for historically disadvantaged students. This may be due to their poor education and poor preparation for university at high school level. As a result, they may feel less prepared and empowered for academic tasks, heightening their levels of test-anxiety.

The present study also found that test-anxiety negatively impacts on students' adjustment to university. The higher their level of test-anxiety, the less adjusted students are to university. This may imply that students who constantly worry about their academic performance and who are preoccupied by academic tasks because of fear of failure or pressure to succeed have more difficulties adjusting to the university environment. This suggests that test-anxiety can not only influence students' performance levels, but also their overall well-being at university. No previous studies were identified which assessed the relationship between student test-anxiety and adjustment to university and more research is needed to validate this finding. Research has however indicated that high student test-anxiety is related to poor motivation (Swanson & Howell, 1996), low or poor self-esteem (Hembree, 1988; Hojat et al., 2004; Thomas & Gadbois, 2007; Wachelka & Katz, 1999), feelings of course overload and poor time-management (Sansgiry & Sail, 2006). All of these factors have been shown to impact negatively on students' adjustment to university.

The negative effects of test-anxiety on students' academic performance and adjustment may be reduced by teaching students learning and study strategies, test-taking skills, time-management skills, relaxation techniques, providing a clear and precise course outline specifying what is expected, giving precise examples of what might be asked in upcoming examinations, and increasing their ability to concentrate and focus (e.g., Miyasaka, 2000; Yousefi, Mansor, Juhari, Redzuan, Talib, Kumar, & Nuderi, 2009). For instance, research has indicated that adequate test preparation of students leads to better academic performance (Chittooran & Miles, 2001; Norton & Park, 1996).

Hembree's (1988) meta-analysis of 137 studies provides an overview of which specific interventions or treatment approaches have proven to be successful in reducing test-anxiety among students. Hembree (1988) classified treatment approaches into five distinct categories: behavioural (influencing the emotionality component of test-anxiety), cognitive (influencing the worry component of test-anxiety), cognitive-behavioural (influencing emotionality and worry component of test-anxiety), study skills training and test preparation. Behavioural and cognitive-behavioural approaches²², as well as test preparation were found to reduce students' test-anxiety; whereas cognitive approaches and study skills training were ineffective. Similarly, behavioural and cognitive-behavioural approaches²³ and study skills training were effective in improving students test performance and overall academic performance (Hembree, 1988). Based on their findings Hembree (1988) and Ross and Driscoll (2006) advise that multiple interventions can be effective and should be used

²²Reducing test-anxiety: Effective behavioural treatments included systematic desensitization, relaxation training, modelling, covert positive reinforcement, extinction and hypnosis (Hembree, 1988). Successful cognitive-behavioural treatments included cognitive modification, attentional training, insight therapy, anxiety management training and stress inoculation (Hembree, 1988).

²³Improving academic performance: Effective behavioural treatments included systematic desensitization, modelling and hypnosis (Hembree, 1988). Successful cognitive-behavioural treatments included cognitive modification, attentional training, insight therapy and anxiety management training (Hembree, 1988).

together on an individual basis or administered in groups to reduce student levels of test-anxiety. Students high in test-anxiety but receiving intervention with treatment approaches described above will perform as well academically as students with low levels of test-anxiety (Hembree, 1988) or show an improvement in their academic performance (Ross & Driscoll, 2006). Although study skills were found to be ineffective in reducing test-anxiety they did improve test-performance (Hembree, 1988). Erbe (2007) provided a practical example on how study skills can improve performance and lower test-anxiety. She recommends the creation of a 'cheat sheet' that each student should create in order to effectively study and prepare for a test (a single sheet of paper, individually created, containing no photocopies, summarizing and organizing all relevant course information). This process, according to Erbe (2007), leads to adequate learning, improves performance and reduces test-anxiety as students have adequately prepared for a test and no longer need the prepared cheat sheet to cheat in examinations. Hence, students' test-anxiety is a factor that can and should be treated by academic counsellors and academic support programs in order to achieve the desired positive outcome of better student performance and ultimately better student retention and lower student dropout.

5.4.3 Perceived social support from friends and perceived social support from family members do not predict adjustment and academic performance

The present study did not find the assumed relationships between perceived social support from friends or family members and students' academic performance. Although perceived social support from friends was related to students' academic adjustment, social adjustment and institutional attachment, neither social support variable was found to be predictive of students' adjustment or academic performance at university. These findings were not expected and contradicted previous research which either found support for a

significant positive relationship between social support from friends and/or family members and students' adjustment (e.g., Aspinwall & Taylor, 1992; Halamandaris & Power, 1997, 1999; Hertel, 2002; Hinderlie & Kenny, 2002; Holahan et al., 1995; Lidy & Kahn, 2006; Pratt et al., 2000; Schwitzer et al., 1993; Solberg & Villareal, 1997; Tao et al., 2000) and academic performance (e.g., Barnes et al., 1983; DeBerard et al., 2004) at university. However, the present study was in line with research conducted by Friedlander et al. (2007) who also found no relationship between perceived social support from family members and adjustment (see also Bordes et al., 2006; Cutrona et al., 1994).

As no other local study was identified which assessed perceived social support of friends and/or family members of students together with adjustment and academic performance at university, more research is necessary to validate this finding for historically disadvantaged students. One possible explanation might be that perceived social support from family members (and old friends) diminishes or becomes less important once students leave home and enter the university environment. As students relocate to a new city or environment the physical distance between them and their families (and friends) may make regular contact more difficult and less often. This does not mean that their support is unimportant, rather, it is suggested that other forms of social support become more prominent and influential in students' adjustment and academic performance. A further explanation might be related to the fact that many historically disadvantaged students are first generation students of their respective families. As a direct consequence, family members and previous friends might be unable to provide the type of social support that students are seeking, expecting, desire or need; because they have no previous experience or knowledge on which to draw or pass on. They may be unfamiliar with the university environment and academic requirements of being a student in higher education, unaware of the many possible obstacles students may face, or unfamiliar with the pressure, stress and anxiety students may experience at university. It is

therefore recommended to assess perceived social support differently in future research. This may include assessing perceived social support from friends ‘on campus’, perceived social support from university staff and lecturers and perceived social support from mentors and tutors. These perceived social support variables might be better suited to explain students’ adjustment and academic performance at university.

Table 19 below provides a summary of which constructs were predictive of students’ adjustment and academic performance at university, together with possible and suggested initiatives or interventions to be conducted by universities to assist students. For example, students’ help-seeking behaviour should be openly encouraged by all university personnel and every effort should be made to ensure that students receive the time, attention and assistance they need. This not only builds a strong positive relationship between the student and the university; but also fosters a sense of belonging to the institution, of being part of the university community, as well as leading to positive (reinforcing) feedback to other students contemplating asking for assistance or support. Central to the recommendations assisting students, is the concept of empowering and equipping students with a variety of different coping skills; as coping skills may effectively support and assist students on multiple levels simultaneously. That is, for example, teaching students time management skills as well as study and learning techniques, may positively influence and increase their levels of self-efficacy while at the same time reduces their levels of experienced stress, academic overload and test-anxiety. It is important to stress and advocate that no single construct or single intervention based on one construct may be similarly effective or helpful to all students. That is, for example, some students may need help and assistance with adjusting to the institution, whereas other students may need help in managing their academic workload and perceived stress. It is therefore advised to follow a holistic approach when designing and implementing student support and assistance programs; either offering a variety of different programs, each

focusing on one main aspect for students to select, or developing a single program which incorporates all suggested aspects.

Table 19

Psychosocial Constructs Predictive of Students' Adjustment and Academic Performance with Suggested Intervention for Universities

Predictive construct	Possible initiative / intervention
<i>Help-seeking</i>	<ul style="list-style-type: none"> - Actively encourage help-seeking by all university staff. - Ensure students' asking for help receive all the advice, support and assistance they need. - Enhance and support efforts made by the counselling services available on campus.
<i>Intrinsic motivation</i>	<ul style="list-style-type: none"> - Identification of students' true interests and according degree placement. - Relevance of both high school and university career guidance and career counselling. - Student advisor and student to select a suitable study program together. - Lecturers to provide/initiate stimulating classes and course content.
<i>Self-esteem</i>	<ul style="list-style-type: none"> - Positive reinforcement and encouragement by all staff members and fellow students.
<i>Perceived stress</i>	<ul style="list-style-type: none"> - Teaching and training students in appropriate coping strategies (e.g., time management skills, study and learning techniques, problem focused coping, learned resourcefulness) - Teaching relaxation techniques, cognitive behavioural skills and providing stress management programs. - Participation in sporting and extracurricular activities. - Encouraging and assisting students in building a social support network. - Provision of opportunity for regular academic and social interaction with staff members. - Improvement of student orientation programs. - Interaction with puppies or certified therapy dogs to reduce students stress levels.
<i>Academic overload</i>	<ul style="list-style-type: none"> - Teaching and training students in appropriate coping strategies (e.g., time management skills, study and learning techniques). - Ensure appropriate and suitable degree choice.
<i>Amotivation</i>	<ul style="list-style-type: none"> - Increase and stimulate students' intrinsic motivation. - Familiarize staff members with different types of motivation to better assist and help students. - Change students' attitude / behaviour by stimulating their interests.

Table 19 continued

Predictive construct	Possible initiative / intervention
<i>Self-efficacy</i>	<ul style="list-style-type: none"> - Teaching and training students in appropriate coping strategies (e.g., time management skills, stress management skills, study and learning techniques). - Improve students' confidence levels. - Increase students intrinsic motivation
<i>Test-anxiety</i>	<ul style="list-style-type: none"> - Teaching and training students in appropriate coping strategies (e.g., time management skills, study and learning techniques). - Teaching and training students in test-taking skills and how to adequately prepare for an upcoming examination. - Provide students with relaxation techniques. - Applying behavioural and cognitive-behavioural treatments in order to reduce test-anxiety. - Lecturers to provide students with a clear course outline, indicative of expectations and course requirements.
<i>Adjustment</i>	<ul style="list-style-type: none"> - Encourage students to participate or be part of university activities. - Extracurricular activities to have a clear structure, to be supervised and to be high in quality. - Involvement of senior/graduate students to enhance students' academic and social adjustment. This may also include assigning graduate students as a mentor or tutor for first year students. - Informing of family members of difficulties first year students may experience at university, to enable families to be supportive and offer advice. - Monitoring of students' adjustment levels to university and implementation of an early warning system, using the SACQ as a screening tool. - Teaching and training students in appropriate coping strategies (e.g., problem-solving, positive reappraisal, seeking social support, confrontive coping). - Enhance and support efforts made by counselling services available on campus.
<i>General / All</i>	<ul style="list-style-type: none"> - Implementation of a holistic approach. - Advertise and communicate the availability of all services and supportive programs to students.

5.5 Implications for group differences and moderation

Results confirmed that there are several demographic differences and some path differences among the investigated variables. This implies that moderator variables should be addressed and examined in future research to further extend current knowledge, to enhance appropriate interpretation and to facilitate application towards specific groups of students.

5.5.1 Gender differences and moderation

As predicted, perceived stress was higher among female students than male students. This result is in accordance with previous research which has indicated similar results (e.g., Abouserie, 1994; Baker, 2003; Greer, 2008; Hudd et al., 2000; Michie et al., 2001; Misra & McKean, 2000; Misra et al., 2000; Wohlgemuth & Betz, 1991). This does not necessarily imply that female students are under greater academic stress at university. Higher academic stress among female students may be explained by females scoring and assessing negative events more frequently and more prominently than males (Allen & Hiebert, 1991). Lower academic stress among male students may result from their socialization process, where males learn that being emotionally expressive is a form of weakness and not considered to be an appropriate masculine response or reaction (Davidson-Katz, 1991).

The result that intrinsic motivation is higher for female students than for male students was only marginally significant and should be interpreted with caution. Some research studies have shown intrinsic motivation to be higher among female students (e.g., Jeffrey et al., 2009; Muller & Louw, 2004; Roxas & Stonback, 2004; Vermeir & Van Kenhove, 2008).

The assumption of academic overload being higher among female students was not supported. Academic overload was higher among male students than female students. This finding is not surprising, however, as the prediction for academic overload was based on only

one local research study by Bitzer and Troskie-De Bruin (2004) which referred to high school students academic overload and not to university students. The present study suggests that male students are more overloaded at university. Hence, male students find their academic work at university more demanding. Female students may adopt better study techniques (i.e., deep learning approach), may be more organized and structured in their daily routines and responsibilities, may have a more supportive and extensive social support network which enables them to discuss their problems, and may be more intrinsically motivated – resulting in lessening the impact of academic overload at university.

The present study did, however, demonstrate the lack of the assumed gender differences among the variables of self-esteem and perceived social support from family members among students. This result is in line with previous research which also demonstrated no gender differences for the variables of self-esteem (Gentile et al., 2009; Gloria et al., 1999; Halamandaris & Power, 1997; Trzesniewski et al., 2003) and perceived social support from family members among students (Gloria et al., 1999; Halamandaris & Power, 1997; Lyons et al., 1988). It further confirms previous findings that some/specific variables may not differ among students at university.

This also applies to the variables of help-seeking, extrinsic motivation, amotivation, test-anxiety, perceived social support from friends, adjustment and academic performance where no gender differences were found among students. This implies, at least for the present sample of historically disadvantage students, that the variables are not influenced by gender.

Results of the gender moderation indicated that there are no significant path differences in the extended model between male and female students. Although, the paths between test-anxiety and adjustment (test-anxiety being an important predictor of adjustment for females but not for males) and between amotivation and academic performance (amotivation being a more important predictor of academic performance for males than for

females) were marginally significant. This implies that the extended model explained students' adjustment and academic performance equally well and is equally well suited for both males and females. As shown in the results, the extended model explained 36% of the variance in academic performance for male students compared to 37% for female students.

5.5.2 Comparison to Petersen (2006), Davy et al. (2009), Ojeda (2011) and Seipp (1991)

Petersen (2006)²⁴ also assessed gender as a moderator in their original model to predict the adjustment and academic performance of students and found significant differences between male and female students at UCT for the effects of introjected regulation, self-esteem and perceived stress on adjustment. These results were not replicated in the present study. The results for the effect of perceived stress on adjustment, however, indicated a similar trend. Whereas Petersen (2006) found a significant difference between male and female students for the effect of perceived stress on adjustment – with perceived stress being a more important predictor for male students; in the present study no significant differences were found, but perceived stress also had a higher impact on male students than female students. Results of the study were however in line with research by Ojeda et al. (2011), who also found no gender differences for the path from self-efficacy to adjustment. Petersen (2006) further indicated significant differences between male and female students for the effects of adjustment, amotivation, self-esteem and academic overload on academic performance. These results were also not replicated in the present study. Whereas the result of adjustment on academic performance indicated a similar trend; the other variables showed no similarities. Amotivation was a more important predictor of academic performance for females in the Petersen (2006) study, whereas in the present study, amotivation was a more

²⁴ This study refers to Petersen's (2006) original dissertation and not the article that was published later. The moderator analysis for gender was not reported in the article.

important predictor for males (marginally). This result is in line with an earlier finding by Davy et al. (2009), who also found amotivation to be a significant predictor for both male and females, but to be more important for males. The additional results by Davy et al. (2009) that intrinsic motivation is an equally significant predictor of academic performance for males and females, and that identified regulation is a significant predictor of academic performance for males were not replicated. In line with Davy et al. (2009), however, was the result of the path from introjected regulation to academic performance, which was non-significant for males and females. Also, no gender differences were found for the effect of test-anxiety on academic performance, a finding which was similar to the results from Seipp's meta-analysis among a German sample. However Seipp's focus was primarily on general anxiety, and not on test-anxiety. It is rather difficult to compare the moderator result of the present study to previous findings, or to reach any sort of conclusion, for two main reasons. First, only a few studies were identified which also assessed (some) of the variables of the present study. Secondly, of the studies that were identified, most had a different research methodology (e.g., conducted overseas, no focus on historically disadvantaged students, etc.). More research is needed to investigate if gender functions as a moderator for the effect of psychosocial variables on students' adjustment and academic performance (as suggested by some of the results from Petersen [2006]) or not (as suggested by the results of the present study).

5.5.3 Age differences and moderation

As expected, younger students were found to be more extrinsically motivated at university than older students. This was in line with previous research by Jacobson (2000) who found that traditional students (younger students) exhibited higher extrinsic results on the motivation subscale of the Motivated Strategies for Learning Questionnaire (MSLQ) than non-traditional students (older students). Morstain and Smart (1977) and Wolfgang and

Dowling (1981) suggested that younger and older students have different motivational reasons for going to university. As pointed out by Justice and Dornan (2001), for example, older students are more inclined to attend university for intrinsic reasons (e.g., self-esteem, personal interest or intellectual challenge), whereas younger students mention more extrinsic motivations (e.g., financial rewards, parental expectations, avoiding punishment, recognition from significant others).

The finding that younger students experience more perceived stress at university than older students was also anticipated. This is in accordance with earlier results conducted by other researchers (Malefo, 2000; Michie et al., 2001; Misra & McKean, 2000). For example, Malefo (2000) indicated that students' stress decreases with decreasing age. He reported that first year students have higher levels of stress than second year students, and third and fourth year students had lower levels of stress than first or second year students. Similarly, Michie et al. (2001) in a study with 112 undergraduate psychology students reported higher levels of academic stress for younger students. Allen and Hiebert (1991) argue that younger students have not yet fully developed their supportive networks at university and mastered the coping techniques used by older, more senior students – and therefore experience more stress at university. This view is mirrored by Greer (2008) who advocates that younger students will learn to manage their stress levels better with increasing age.

As hypothesized, there were no age differences among the variables of perceived social support from friends and perceived social support from family members among students. This result is in line with previous research by Lyons et al. (1988) who also demonstrated no age differences for the two variables. Hence, the perceived level of social support from friends and family members at university does not appear to be influenced by how old students are.

Age differences were also not found for the variables of help-seeking, intrinsic

motivation, amotivation, self-esteem, academic overload, self-efficacy, adjustment and academic performance. Although help-seeking and academic adjustment was higher for older students; the differences were marginally and not statistically significant, supporting research by Jdaitawi et al. (2011) and Ramsay et al. (2007). This implies, at least for the present sample of historically disadvantage students, that the variables are not influenced by a student's age.

Test-anxiety was higher among younger students than older students. This finding supports research by Mueller et al. (2000), Nunn (1994) and Yarbrough and Schaffer (1990) where older university students displayed academic-achievement-related anxiety to a lesser extent. This may suggest that older students have acquired more experience in test-taking and test-preparation and learning skills and as a result feel less threatened or worried by an upcoming examination – resulting in lower levels of test-anxiety. Younger students may need more time to develop and adjust to academic demands and requirements and need to develop their coping and stress-management techniques. This may also include learning how to effectively reduce their level of test-anxiety.

Results of the age moderation revealed two significant path differences. Results showed that the path from intrinsic motivation to adjustment and from self-efficacy to adjustment differed as a function of age. Intrinsic motivation was an important predictor of adjustment for older students but not for younger students. This is in accordance with previous research which indicated older students to be more intrinsically motivated than younger students (Klein, 1990; Nunn, 1994) and to be motivated intrinsically rather than extrinsically (Morstain & Smart, 1997; Wolfgang & Dowling, 1981). This implies that being intrinsically motivated leads to better student adjustment among older students. Older students' self-interest to further their education and to acquire new knowledge plays an important role in their adjustment to university. Similarly, self-efficacy was an important

predictor of adjustment for older students but not for younger students. Thus high levels of self-efficacy lead to better adjustment to university for older students. This may imply that older students who are self-confident and more self-reliant and who believe in their academic skills and competencies cope better with challenges and difficulties at university and as a result find it easier to adjust and fit in.

Both path differences were among psychosocial variables and adjustment to university, suggesting that the extended model of the present study was slightly more applicable to explain students' adjustment to university for older students than for younger students. The extended model explained more of the variance in students' adjustment to university among older students (43%) than among younger students (19%). Although no path differences were found between younger and older students among psychosocial variables predicting academic performance, the extended model explained more of the variance in academic performance for younger students (44%) than older students (28%). That is, the strength of the association for some paths predicting academic performance was greater for younger than older students. This implies that the extended model may be more appropriate to explain older students' adjustment to university and younger students' academic performance at university. Further research is advised to establish if this also holds true among other students and institutions.

5.5.4 Residence status differences and moderation

As expected, students living on campus during the academic year performed better academically and received higher grades than students living off campus. This was in accordance with research by Nicpon et al. (2006-2007) who also showed higher academic performance for students who lived on campus than those who lived off campus. The current results, as well as the research by Nicpon et al. (2006-2007) thus contradict earlier results

where no difference in academic performance was found between students living on campus compared to students living off campus (Blimling, 1999; Graff & Cooley, 1970). This may imply that students living on campus during the academic year are better prepared academically, more focused and committed towards their academic responsibilities, spend more time studying, are less distracted by off campus activities and as a result perform better academically.

The prediction of higher social adjustment for students living on campus was not supported. Although social adjustment was higher for students living on campus the difference was marginal only and not significant. Jones et al. (2008) indicated that students living on campus were better adjusted socially to the university. In addition only a marginal difference was found for better academic adjustment of students living on campus. These results may imply, at least for historically disadvantaged students, that living on campus and spending more time on campus than students living in private accommodation does not necessarily automatically lead to better adjustment to the university. A possible explanation for this finding might be that the type and quality of interaction students experience on campus with fellow students', academic staff and university personnel is markedly more important than the amount of time spent on campus. Another explanation might be that the quality of living on campus (in university residences) is in fact a hindrance and counterproductive to students' adjustment to university. Student residences at UFH were characterized by poor living conditions, overcrowding, and a constant or re-occurring lack of working facilities. Studying and living under these conditions does not lead to students' enjoying their time at university, forming a close bond with the institution or to adjusting positively to the university. Hence, more research is needed to determine if students' adjustment levels differ between students who reside on campus and off campus.

The assumption of no difference for the variable of self-efficacy was also not supported, as self-efficacy was found to be higher among students living on campus. This may suggest that students living on campus develop more (and faster) self-reliance, independence, and autonomy at university and become more self-confident about their academic capabilities and skills. The constant interaction with the university environment may facilitate the progression of students' self-efficacy. This explanation may also in part apply towards student levels of test-anxiety; as students living on campus had lower levels of test-anxiety than students living off campus. Being in constant contact with the institution, its lecturers and fellow students is certainly easier for students who reside on campus. As a result students may find it easier and more convenient (and more readily) to participate in study groups or support programs and to interact with academic staff in additional academic or social activities. This may lead to students feeling better prepared and less anxious towards upcoming examinations.

No residence status differences were established for the variables of self-esteem, perceived stress, perceived social support from friends and perceived social support from family members. Although this finding was expected and is almost in line with research by Gloria et al. (1999)²⁵; it was also the only identified study to which the results could be compared. More research needs to be conducted to determine if psychosocial predictor variables of students' adjustment and academic performance differ between students living on campus and off campus. These results imply, at least for the present sample of historically disadvantaged students, that the variables are not moderated by students' residence status.

Results of the residence status moderation indicated two significant path differences in the extended model among students living on and off campus during the academic year.

²⁵Gloria et al. (1999) also found no residence status difference for the variable of self-efficacy; whereas the present study found self-efficacy to be higher among students living on campus.

The path from academic overload to adjustment and from self-esteem to academic performance differed as a function of residence status. Academic overload was a predictor of adjustment for students living on campus but not for students living off campus. That is, academic overload negatively predicted adjustment of students living on campus. This means that students residing on campus who feel overloaded by the amount of academic work or who experience the academic work as too demanding will find it more challenging and difficult to adjust to the demands and requirements of university life.

Self-esteem was an important predictor of academic performance for students living off campus but not for students living on campus. That is, self-esteem positively predicted the academic performance for students who reside off campus, with higher levels of self-esteem leading to better academic performance. This finding was in line with previous research which indicated a small but significant positive association between self-esteem and academic performance (Lane et al., 2004; Reitzes & Mutran, 1980; Richardson et al., 2012; Stupnisky, Renaud, Perry, Ruthig, Haynes, & Clifton, 2007; van Overwalle, 1989; Woo & Frank, 2000). The findings of the present study are also in accordance with previous research which has suggested that higher levels of self-esteem a) will lead towards setting higher individual goals (e.g., the goal to attain higher academic marks) and b) serve as a promotive and protective factor facilitating and supporting personal growth and academic achievement (DiPaula & Campbell, 2002; Whitesell et al., 2009). Students living off campus may hold more self-belief about their abilities and skills and have a more positive self-concept about themselves because they are required to manage all aspects of daily life on their own; whereas students residing on campus are still (loosely) guided or directed by a provided sense of structure in their lives (e.g., rules and regulations at student residences, provision of routine meals, etc.). The acquired higher levels of self-esteem may then lead them to be better prepared to cope and deal with possible difficulties and obstacles at university, resulting in

better academic performance. Self-esteem may therefore be considered to be an important factor for students' academic success especially for this sub-group of students, as self-esteem was not found to have a positive influence on academic performance on any other group of students. More research is needed to substantiate the possible effects of moderator variables. It is suggested that the extended model may be more appropriate to explain students' adjustment and academic performance for students residing off campus than for students living on campus. The model was able to explain more of the variance in students' adjustment to university among students living off campus (42%) than among students living on campus (30%). Similarly, the model explained more of the variance of students' academic performance among students living off campus (42%) than among students living on campus (32%). This may be explained by the fact that the strength of the association for some paths was greater for students living off campus than for students living on campus.

5.6 Contributions of present research

The present research study established concise contributions to our current knowledge and understanding of how certain psychosocial constructs influence students adjustment and academic performance competencies at university. It contributed not only to the identification of specific psychosocial factors, but also towards understanding student behaviour at university and towards identifying where students would benefit from further help and assistance to succeed academically. These findings are particularly pertinent and relevant for the local higher education sector, as well as potentially vital and essential for the future academic success of both institutions and students alike, in order to be able to facilitate and endorse better student throughput and retention and to minimize dropout. The contributions should be interpreted by keeping in mind both the context of study as well as the background

of its participants (historically disadvantaged university and students). More research is needed to identify universal predictors.

Overall, the study demonstrated further empirical support for the growing evidence and importance of psychosocial factors when predicting student adjustment and academic performance at university. It contributed to our understanding that previous academic performance at high school and financial status, for example, are not the only factors having an influence / impact on students' academic success at university. The present study highlighted not only the central role of adjustment for students academic success; but also how the factors of help-seeking, intrinsic motivation, self-esteem and self-efficacy positively, and the factors of amotivation, perceived stress, academic overload and test-anxiety negatively, effect students adjustment and academic performance at university. As research with psychosocial factors to predict academic performance is very limited in South Africa, these findings add to a very sparse local knowledge field. This applies especially to the factors of test-anxiety and self-efficacy. These findings are unique (locally), as they have not been tested previously in a local context to predict adjustment and academic performance.

On a theoretical level, the model replication further confirmed previous theoretical assumptions regarding the predictability of psychosocial variables for historically disadvantaged students adjustment and academic performance at university. A model replication study is an essential step for theory to advance and to become applied and not to remain a statistical exercise. The model extension and identification of additional factors, on the other hand, further extended our current theoretical knowledge about psychosocial variables and their relationships toward adjustment and academic performance, especially locally. It thus provided an extended theoretical framework to consider when predicting students academic success at university.

An additional contribution was the assessment of moderator variables (age, gender, residence status) in the present study. This is a well-known knowledge gap, not only locally, but also in international research. This study added vital initial information to a very limited knowledge field.

5.7 Limitations

Almost all research studies have limitations; and a range of limitations apply to this study which should be addressed in future research. It is therefore advised to interpret the findings of the current study within the context and among the participants in which it was conducted.

The first limitation of the present study is its rather small sample size ($N = 280$). A smaller sample size is inherent with increasing the likelihood of reducing statistical power, reducing the ability to find significant differences and relationships, and increasing the possibility of Type II error. The sample size was, however, adequate and large enough to conduct path analysis and model interpretation for the model replication and model extension.

Inherent with all studies that administer self-report measures there is the possibility of response bias. This may include responding randomly or inconsistently, responding to questions moderately or neutral or using a tendency of acquiescence or negativism to answer questions (McGrath, Mitchell, Kim, & Hough, 2010)²⁶. In addition there is the possibility of responding to self-report measures in a socially desirable and socially acceptable manner.

The third limitation refers to methodological issues encountered in the present study. That is, a number of scales (three sub-scales of academic motivation: identified regulation, external regulation and amotivation; the self-esteem scale; and the social adjustment sub-

²⁶For a discussion on response bias, refer to McGrath et al. (2010).

scale of the SACQ) displayed rather low internal consistency. The low internal consistency for the three academic motivation sub-scales may be attributed to the fact that each scale consisted of only four items. The results of the above mentioned scales should therefore be interpreted with caution as not all scale items may be measuring the same intended construct. For example, for the SACQ scale, Taylor and Pastor (2007) recommended that scale items need to be revised. It is unknown if and/or to what extent the low reliability of the above mentioned scales may have contributed to the results of the present study.

The fourth limitation refers to the generalizability of the findings. This study was conducted among historically disadvantaged students at a historically disadvantaged university. All students were undergraduates, with most of the sample being comprised by black students (96%). As pointed out by MacCullum and Ausin (2000), single studies conducting structural equation modelling rarely acknowledge their limitations; and thus need to advise that results and “conclusions may be limited to the particular sample, variables, and time frame” (p. 211) under which it was carried out. It is therefore unknown if or to what extent both models tested in the present study would be appropriate to explain and predict students adjustment and academic performance among relative ‘advantaged’ students, graduate students, or other student groups (i.e., white, coloured or Indian students). Results of this study do not imply generalizability to other student groups.

Fifthly, a related limitation refers to the fact that this research was conducted at only one institution and is based on only one sample and not on multiple samples from different universities. These results may therefore not apply to other institutions and may differ compared to historically advantaged universities. Also, there may have been confounding factors which influence or are characteristic of this particular university and which do not apply to other universities (e.g., students’ attitude towards university, students’ perception of university environment, attitude and perception toward teaching and academic staff, etc.).

A sixth limitation may relate to the psychosocial predictor variables chosen for the current study. One might argue that additional or alternative factors should have been incorporated based on the meta-analysis by Richardson et al. (2012) which identified a number of factors with higher effect sizes for academic performance than some of the included variables. This reasoning is certainly valid but has to be considered in the following context: First, the meta-analysis by Richardson et al. (2012) was published two years after work on the present study had begun. Thus the variables of this study were already chosen and decided upon and data collection was already completed by the time their research was available. Secondly, this study represents both: a) a replication of previous work in a South African context to test a previously identified model explaining adjustment and academic performance among a similar sample of students at a historically disadvantaged university and b) a continuation and extension of previous work by suggesting an extended model that may explain more of the variance in students' adjustment and academic performance. It was therefore necessary to include all identified variables used by Petersen et al. (2009), regardless of their previous predictive or explanative power of adjustment and academic performance. Thirdly, including even more variables would have further extended an already long questionnaire for students to complete. Also, even though some psychosocial variables may have small effect sizes with adjustment and / or academic performance they are still important to fully understand students' adjustment process to the university and their academic performance. Finally, the current study included the variables of both test- anxiety and self-efficacy, which have been found to be among the psychosocial variables with the highest effect sizes for academic performance (i.e., Richardson et al., 2012).

A seventh limitation refers to the multitude of psychosocial and psychological factors (e.g., the meta-analysis by Crede & Niehorster, 2012 and Richardson et al., 2012) which influence students' adjustment and academic performance at university. The vast number of

psychological and psychosocial factors related to adjustment and academic performance makes it rather difficult to include all in a model to predict students' adjustment and academic performance at university. Hence, students may well be influenced by additional factors (by factors not assessed in the present study) while attending university. In addition, students are also influenced by other factors (e.g., financial and economic factors, personal factors, sociological factors, etc.). This may be an explanation for the rather moderate amount of variance explained in the present study (as well as in previous research using psychosocial variables to predict students' adjustment and academic performance at university).

A further limitation may refer to the fact that the present study was unable to assess the moderator variable of race/ethnicity. However, as the student population at the University of Fort Hare is predominantly black, this was also reflected in the study sample.

A final limitation of this study may have been the lack of the perceived social support from friends and family members' variables to be predictive of students' adjustment and academic performance at university. It is suggested that other forms of social support may be more important and relevant in predicting students' adjustment and performance at university and that these additional or alternative aspects of social support are considered in future research.

There are also a number of strengths which characterize this research study. First, the dependent variable was assessed by the overall final academic year marks students achieved at university and not by perceived or assumed performance of students. Second, this research study included a replication of a previously tested path model to predict students' adjustment and academic performance at university. Replication of a previously tested path model is rare in psychological research but necessary to conduct among different samples to establish meaningfulness (Kline, 2005). This research thus established some generalizability to the proposed model by Petersen et al. (2009). Thirdly, this study provided (further) support for

the multidimensionality of adjustment and importance of the variable of help-seeking when predicting historically disadvantaged students' academic performance. Both aspects are important to consider as they were not supported in Petersen et al.'s (2009) research. Fourth, path analysis was used in the current study to test the hypothesis. Path analysis is rarely used in South African research and superior²⁷ to regression analysis (Asher, 1983; Olobatuyi, 2006). Fifth, this research study assessed psychosocial predictor variables to predict adjustment and academic performance among historically disadvantaged students. This group of students may be especially important to universities as it is characterized by a high dropout rate, low retention rate and low graduation rate (e.g., Balintulo, 2001; Cloete et al., 2004; Department of Education, 2001; Fiske & Ladd, 2004; Letseka et al., 2009; Scott et al., 2007; University World News, 2007a). This research thus provided universities with important information of which psychosocial variables might be effective to improve students' university experience and academic achievement.

5.8 Directions and recommendations for future research

5.8.1 Considering previous academic performance at high school as an alternative or additional factor

As the tested model leaves a substantial amount of unexplained variance in students' academic performance at university, alternative and additional factors must be involved.

Previous research has consistently suggested that previous academic performance at high school is the single most important predictor variable, as it accounts for more variance

(explaining up to 28%) in academic performance than any other single variable (e.g., Burton

²⁷Path analysis “[...] allows us to move beyond the estimation of direct effects, the basic output of regression. Rather, path analysis allows one to examine the causal processes underlying the observed relationships and to estimate the relative importance of alternative paths of influence. The model testing permitted by path analysis further encourages a more explicitly causal approach in the search for explanations of the phenomena under investigation” (Asher, 1983, pp. 36 – 37).

and Ramist, 2001; Robbins et al., 2004; Trapmann et al., 2007). Locally, a substantial part of research has focused on matric marks and previous academic performance of students in explaining students' academic performance at university (e.g., Bothma et al., 2004; Downs, 2009; Huysamen, 2000; Jawitz, 1995; Potter & van der Merwe, 1994). Results have, however, been mixed. Early studies on matric marks and academic performance of students at university tend to show that matric marks are poor predictors of academic performance (Bargate, 1999; Botha & Cilliers, 1999; Paras, 2001; Wood, 1998). More recent research indicates a significant positive relationship between matric marks and academic performance (Bothma et al., 2004; Dlomo, Jansen, Moses, & Yu, 2011; Huysamen, 2000; Naude et al., 2011; van der Merwe & de Beer, 2006; van Eeden, de Beer, & Coetzee, 2001). For example, Bothma et al. (2004) indicated that matric marks explained 20.25 % of the variance in academic performance among a sample of 81 first year students in 1999, 11.56% of the variance for 184 first year students in 2000 and 44.89 % of the variance for 511 first year students in 2001. However, previous research also shows that matric marks are a better predictor of academic performance for white students than for black students and that first year academic performance of students is a better predictor of second or third year performance than matric marks or psychosocial factors (Huysamen, 2000; Petersen et al., 2010). For example, correlation coefficients among matric marks and academic performance were higher for white students than for black students (Huysamen, 2000).

Hence, although a number of local research studies have demonstrated the usefulness and predictability of previous high school performance in explaining academic performance at university; their applicability, suitability, reliability and fairness, especially for historically disadvantaged students in a South African context, is questionable. This concern has been raised by a number of local researchers (Chisholm, 2004; De Villiers, 1999; Fraser & Killen, 2005; Huysamen, 2000; Nunns & Ortlepp, 1994; Shochet, 1994) which have argued and

implied that previous high school performance does not reflect the true potential and academic performance capabilities historically disadvantaged students possess, are able to develop, enhance, master or improve on in subsequent years of study. As students adjust to university life and their new environment, they become accustomed to the demands and expectations of university, participate in academic and student development programs, and improve their level of competency in English language through the interaction with both, fellow students and lecturers - their academic performance at university will continually improve – referred to as the late blooming hypothesis by Huysamen (2000). The present study supports this line of argumentation by demonstrating the usefulness of (alternative) psychosocial variables in predicting students' academic performance at university.

Furthermore, this study is in line with other studies which advocate the use of psychosocial variables instead of (or in addition to) previous academic performance at high school to predict and explain academic performance of students at university (e.g., Abdullah et al., 2009; Crede & Niehorster, 2012; DeBerard et al., 2004; Lane & Lane, 2001; Lane et al., 2004; Neville et al., 2004; Richardson et al., 2012; Robbins et al., 2004; Russell & Petrie, 1992; Solberg & Villareal, 1997; Tracey & Sedlacek, 1984, 1985; Zajacova et al., 2005).

Particularly, the present study was able to explain more of the variance in students' academic performance using psychosocial variables than a number of local studies using previous academic performance at high school (e.g., van der Merwe & de Beer, 2006; Naude et al., 2011). It is advocated that in order to attempt or try to explain more of the variance in historically disadvantaged students' academic performance at university, additional psychosocial variables be included into the model (beyond those already included in the model extension). Based on previous literature findings, the variables of learning approaches, goal orientations, effort regulation, conscientiousness, neuroticism, emotionality and depression (Crede & Niehorster, 2012; Richardson et al., 2012) might be especially viable

additions to our model, as indicated by their relationship to adjustment and academic performance.

5.8.2 Considering additional psychological and psychosocial factors to explain students' adjustment and academic performance at university

The additional above mentioned psychological variables are however not the only variables that require further consideration. The meta-analyses by Richardson et al. (2012) and Crede and Niehorster (2012) alone, suggested many more psychological variables²⁸ that are related to students' adjustment and academic performance. Research in South Africa has however not concentrated on psychological and/or psychosocial factors to explain students' adjustment and academic performance at university. As a direct result, it is simply unknown if, how and/or to what extend the majority of psychological factors listed under Richardson et al's. (2012) and Crede and Niehorster's (2012) meta-analyses relate to students in a local context; as these factors, to a large extend, have not been applied or tested with local students attending local universities. This applies to both historically disadvantaged students but also to other student groups. Further local research is thus essential to establish if relationships between these variables and adjustment and academic performance exist and if these additional variables can also predict how students adjust and perform at university. This would certainly widen and extend our current knowledge and understanding of the processes that influence students' academic success at university.

5.8.3 Considering the influence of intrinsic motivation on adjustment and academic performance

²⁸ This included additional social support variables, variables related to students coping approaches and self-evaluations, personality traits, learning strategies and learning approaches.

Intrinsic motivation was only related to and predictive of students adjustment to university, but not to their academic performance. The lack of a direct relationship between intrinsic motivation and academic performance was in contrast to the majority of earlier research findings (e.g., Allen & Robbins, 2010; Richardson et al., 2012; Robbins et al., 2004; Robbins et al., 2006). It is suggested that intrinsic motivation might have an indirect effect on academic performance via the mediator variable of adjustment for historically disadvantaged students. More research is needed to substantiate this finding among historically disadvantaged students.

5.8.4 Considering additional student groups' adjustment and academic performance at university

It is recommended that additional research is carried out among other student groups at university. So far, the research reported in the present study as well as previous research conducted by Petersen et al. (2009) has only been carried out among historically disadvantaged students. These students were characteristically undergraduates and mainly black. It is therefore unknown how the tested variables and models in the present study apply and explain student adjustment and academic performance among other groups of students attending university in South Africa; for example, white, coloured or Indian students, postgraduate students, and relatively advantaged students. Unless research is conducted among other student groups; an informed comparison among sub-groups of students remains problematic.

5.8.5 Considering additional research at other institutions

Just as it is vital to conduct research among other student groups, there is also the necessity to conduct additional research at other local institutions to establish if the results

obtained thus far are similar or comparable to students at other universities. To this point, research with psychosocial factors predicting students' adjustment and academic performance at university has been performed at only one historically advantaged university and one historically disadvantaged university. Besides implementing research at additional universities, it is recommended to also include research efforts at recently formed universities of technology as well as among colleges, to establish a comprehensive and holistic overview of the higher education landscape in South Africa.

5.8.6 Considering further research with the proposed extended model

Besides additional research among other student groups and institutions, the tested extended model of the present study should be replicated in further research. This is recommended in order to establish meaningfulness and to be able to provide generalizability to the findings. More research with the extended model is needed so that it does not remain a theoretical model of assumptions and predictions but becomes applied in real life. Furthermore, it is also suggested to include additional variables to the model (examples of possible variables as suggested under 5.8.1 and 5.8.2), not only to establish if they are predictive of students adjustment and academic performance but also to test if this leads to more of the variance being explained among students.

5.8.7 Considering further research with the Student Adaption to College Questionnaire

It is further recommended to conduct additional research with the Student Adaption to College Questionnaire (SACQ) to establish its multidimensionality and factor structure in a local context. Research to date in South Africa with the SACQ (or similar scale) has been

very limited, with only five²⁹ studies having used the scale previously. Out of these five studies, four were conducted at the University of Cape Town, while the remaining study was conducted at the University of Fort Hare. Hence more research among wider student populations and additional universities is recommended.

5.8.8 Considering alternative or additional measures to assess perceived social support

Both variables, perceived social support from friends and perceived social support from family members were found not to be predictive of students' adjustment and academic performance at university. As this was in contrast to the majority of previous international research findings, further research is essential to establish if this result is replicated among other student groups and among samples of students from other universities in South Africa. Furthermore, it is suggested to also include additional measures to assess other aspects of perceived social support for students. Other aspects of perceived social support may be more relevant and applicable to students at university. This may include evaluating perceived social support from lectures, tutors or academic staff, perceived social support from friends 'on campus' or perceived social support from significant others.

5.9 Conclusion

This research has provided empirical evidence that a number of psychosocial variables impact on students' adjustment (help-seeking, intrinsic motivation, self-esteem, perceived stress and test-anxiety) and academic performance (adjustment, amotivation, perceived stress, academic overload, test-anxiety and self-efficacy). Findings further revealed path differences among younger and older students (intrinsic motivation and self-efficacy

²⁹The previous studies which have used the SACQ in South Africa were conducted by Davidowitz and Schreiber (2008), Petersen et al. (2009, 2010), Sennett et al. (2003) and Sommer and Dumont (2011).

were important predictors of adjustment for older students) and among students living on and off campus (academic overload was an important predictor of adjustment for students living on campus; self-esteem was an important predictor of academic performance for students living off campus). Overall, results confirmed the findings of Petersen et al. (2009) that the effects of students' academic motivation, self-esteem and perceived stress on academic performance are partially mediated by the quality of their adjustment to the university. This study further demonstrated that this also applies to the variables of help-seeking and test-anxiety. Additionally, this study provided empirical evidence that an extended model with additional variables further improves the prediction of adjustment and academic performance. It highlights the importance of two additional variables, test-anxiety and self-efficacy; and supports the multidimensionality of the mediator variable adjustment.

Findings of the present study extends the current literature and contributes to the understanding of how and to what extent psychosocial variables influence both students adjustment and academic performance. Our model explained a considerable amount of variance in academic performance (32%), similar to the variance explained by other studies with previous high school performance as predictor variable. This further demonstrates the suitability of psychosocial variables (also for historically disadvantaged students) for predicting adjustment and academic performance. It provided information on alternative factors to predict students' adjustment and academic performance at university, especially for historically disadvantaged students, informing university to look beyond the traditional predictor variables. Also it is one of only a few studies which has assessed if psychosocial predictor variables for adjustment and academic performance differ for the moderators of gender, age and residence status. Richardson et al.'s (2012) recent meta-analysis suggested that to move research forward, moderators have to be identified and tested to ascertain which and for whom psychosocial variables are important predictor variables of academic

performance. The present research represents a first step in the right direction by having tested three possible moderators.

Universities need to be made aware of which and how psychosocial factors influence students' adjustment and academic performance at university. This applies especially to historically disadvantaged students as they are faced with more challenges adjusting to university and performing well academically than more advantaged students. This knowledge may guide universities to develop, refine and rethink current practices. It places them in an informed position to adequately respond to student's needs. Hence, it will permit universities to spend and direct available resources wisely and effectively to increase students overall well-being and adjustment to the institution, and create or stimulate a sense of belonging to university and academic success.

Although a number of student development programs and student support programs are in place at university – their effectiveness raises doubts and their impact needs to be closely evaluated as student retention and graduation is low and dropout high. One is destined to ask if the programs and support services currently offered really support and help students to better succeed at university?

It may therefore be advisable for universities to implement, design or alter intervention, support and development programs or services to also incorporate and focus on psychosocial aspects identified in the current study. A summary on which variables student counsellors and academic support staff might focus their attention is provided in Table 20 below. Based on the present study one could conclude that programs or any form of intervention a) should provide students with skills that improve their coping abilities with university demands to reduce stress, academic overload and test-anxiety, b) be designed to help students understand their own motivations for attending university, c) be designed around increasing students self-beliefs, self-confidence and autonomy, and d) encourages and

motivates students to seek help in a supportive university environment to improve their social and academic skills. Furthermore, these programs and services might benefit and increase their effectiveness by adopting a holistic approach. That is, no single intervention/program may be equally effective for all students to better adjust and perform academically at university. Hence, either a variety of programs should be in place and offered or a single program containing multiple areas to be addressed simultaneously (e.g., a program should not only focus on increasing students-self-esteem, but at the same time also reduce their test-anxiety and perceived stress, incorporate and strengthen students study/learning skills, provide time management skills and offer effective coping strategies to students). Also, it is suggested that in order for preventive, intervention and support programs to be effective, students have to accept them, actively participate in them, and want to be part of them.

Reynolds and Weigand (2010) argued that although the intensity and effort to help students succeed at university has increased, programs and university staff responsible for program development and implementation alone may be inefficient or not enough to help students succeed. “That is why it is essential that all student affairs professionals attend to the literature on first-year students and implement the practical suggestions offered in order to enhance the work of all student affair professionals” (Reynolds & Weigand, 2010, p. 178). Involving and incorporating more university staff members (i.e., lecturers) and graduate students towards helping first-year students to adjust well to university and to perform well academically may be a more successful approach.

Table 20

*Summary of Important Predictor Variables for Historically Disadvantaged Students**Adjustment and Academic Performance at University*

Predictor variables	Adjustment	Academic Performance
Adjustment	-	*
Help-seeking	*	
Intrinsic motivation	*	
Extrinsic regulation		
Introjected regulation		
Identified regulation		
Amotivation		*
Self-esteem	*	
Perceived stress	*	*
Academic overload	†	*
Test-anxiety	*	*
Self-efficacy		*
Perceived social support from friends	†	
Perceived social support from family		

Note: *Significant predictor, †marginal effect

References

- Abdel-Khalek, A. M. (2000). The Kuwait University Anxiety Scale: Psychometric properties. *Psychological Reports, 87*(2), 478-492.
- Abdullah, M. C., Elias, H., Mahyuddin, R., & Uli, J. (2009). Adjustment amongst first year students in a Malaysian university. *European Journal of Social Sciences, 8*(3), 496-505. Retrieved from http://www.eurojournals.com/ejss_8_3_13.pdf
- Abdullah, M. C., Elias, H., Uli, J., & Mahyuddin, R. (2010). Relationship between coping and university adjustment and academic achievement amongst first year undergraduates in a Malaysian university. *International Journal of Arts and Sciences, 3*(11), 379-392. Retrieved from http://openaccesslibrary.org/images/LVG163_Maria_Chong_Abdullah.pdf
- Abouserie, R. (1994). Sources and levels of stress in relation to locus of control and self-esteem in university students. *Educational Psychology, 14*(3), 323-330. doi:10.1080/0144341940140306
- ACT. (2003). *ACT National Curriculum Survey 2002-2003*. Retrieved from <http://www.act.org/research-policy/national-curriculum-survey>
- Addis, M. E., & Mahalik, J.R. (2003). Men, masculinity, and the contexts of help seeking. *The American Psychologist, 58*(1), 5-14. doi:10.1037/0003-066X.58.1.5
- Agar, D. (1990). Non-traditional students: Perceptions of problems which influence academic success. *Higher Education, 19*(4), 435-454. doi: 10.1007/BF00137007
- Akgun, S., & Ciarrochi, J. (2003). Learned resourcefulness moderates the relationship between academic stress and academic performance. *Educational Psychology, 23*(3), 287-294.

- Albrecht, D. D., Carpenter, D. S., & Sivo, S. A. (1994). The effect of college activities and grades on job placement potential. *National Association of Student Personnel Administrators Journal*, 31(4), 290–297. Retrieved from ERIC database.
- Al-Dossary, S. A. (2008). *A study of the factors affecting student retention At King Saud University, Saudi Arabia: Structural Equation Modelling and Qualitative Methods*. (Master's thesis, University of Stirling, United Kingdom). Retrieved from <https://dspace.stir.ac.uk/handle/1893/691>
- Allen, D. (1999). Desire to finish college: An empirical link between motivation and persistence. *Research in Higher Education*, 40(4), 461–485.
doi:10.1023/A:1018740226006
- Allen, J., & Robbins, S. (2010). Effects of Interest-Major Congruence, Motivation, and Academic Performance on Timely Degree Attainment. *Journal of Counseling Psychology*, 57(1), 23-35. doi: 10.1037/a0017267
- Allen, J., & Robbins, S. B. (2008). Prediction of College Major Persistence Based on Vocational Interests, Academic Preparation, and First-Year Academic Performance. *Research in Higher Education*, 49(1), 62-79. doi: 10.1007/s11162-007-9064-5
- Allen, J., Robbins, S. B., Casillas, A., & Oh, I. (2008). Third-year college retention and transfer: Effects of academic performance, motivation, and social connectedness. *Research in Higher Education*, 49(7), 647-664. doi: 10.1007/s11162-008-9098-3
- Allen, S., & Hiebert, B. (1991). Stress and coping in adolescents. *Canadian Journal of Counseling*, 25(1), 19-32.
- Ames, R. (1983). Help-seeking and achievement orientation: Perspectives from attributional theory. In B. Depaulo, A. Nadler, & J. Fisher (Eds.), *New directions in helping* (pp. 165-186). New York: Academic Press.

- Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation process. *Journal of Educational Psychology*, 80(3), 260-267. Retrieved from ERIC database.
- AMOS FAQ #6: Nested model comparisons. (2011). Retrieved August 1, 2011, from University of Texas at Austin, Division of Statistics and Scientific Computation Web site: http://ssc.utexas.edu/software/faqs/amos#Amos_6
- Ancis, J. R., Sedlacek, W. E., & Mohr, J. J. (2000). Student perceptions of campus cultural climate by race. *Journal of Counseling and Development*, 78(2), 180–185. Retrieved from ERIC database.
- Anderson, L.E. (1994). A new look at an old construct: Cross-cultural adaptation. *International Journal of Intercultural Relations*, 18(3), 293-328. doi: 10.1016/0147-1767(94)90035-3
- Ang, R.P., Lim, K.M., Tan, A.G., & Yau, T.Y. (2004). Effects of gender and sex role orientation on help-seeking attitudes. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 23(3), 203-214. doi: 10.1007/s12144-004-1020-3
- Archer, A. (2008). Investigating the effect of Writing Centre interventions on student writing. *South African Journal of Higher Education*, 22(2), 248-264.
- ARWU. (2012). *Academic Ranking of World Universities – 2012*. Retrieved February 25, 2013, from <http://www.shanghairanking.com/ARWU2012.html>
- Asher, H. B. (1983). *Causal Modeling* (2nd ed.). Sage University Paper series on Quantitative Applications in the Social Sciences. Newbury Park, California: SAGE Publications, INC.

- Aspinwall, L. G., & Taylor, S. E. (1992). Modelling cognitive adaptation: a longitudinal investigation of the impact of individual differences and coping on college adjustment and performance. *Journal of Personality and Social Psychology*, *63*(6), 989-1003.
- Astin, A. W. (1993). *What matters in college? Four critical years revisited*. San Francisco, United States of America: Jossey Bass.
- Atkinson, D. R., Lowe, S., & Matthews, L. (1995). Asian-American acculturation, gender, and willingness to seek counseling. *Journal of Multicultural Counseling and Development*, *23*(3), 130-138. doi: 10.1002/j.2161-1912.1995.tb00268.x
- Backhaus, A. L. (2009). *The College Experience: Exploring the Relationships among Student Socioeconomic Background, Experiences of Classism, and Adjustment to College*. Open Access Theses and Dissertations from the College of Education and Human Sciences. Retrieved from <http://digitalcommons.unl.edu/cehsdiss/56>
- Bahrnick, H. P., Hall, L. K., & Berger, S. A. (1996). Accuracy and distortion in memory for high school grades. *Psychological Science*, *7*(5), 265-271. doi: 10.1111/j.1467-9280.1996.tb00372.x
- Baker, R. W. & Siryk, B. (1984a). Measuring adjustment to college. *Journal of Counseling Psychology*, *31*(2), 179-189.
- Baker, R. W. & Siryk, B. (1984b). Measuring academic motivation of matriculating college freshmen. *Journal of College Student Personnel*, *25*(5), 459-464.
- Baker, R. W., & Siryk, B. (1986). Exploratory intervention with a scale measuring adjustment to college. *Journal of Counseling Psychology*, *33*(1), 31-38.
doi:10.1037/0022-0167.33.1.31
- Baker, R. W., & Siryk, B. (1989). *Student Adaptation to College Questionnaire*. Los Angeles: Western Psychological Services.

- Baker, R. W., & Siryk, B. (1999). *SACQ Student Adaptation to College Questionnaire* (2nd edition). Los Angeles, United States of America: Western Psychological Services.
- Baker, R., & Nisenbaum, S. (1979). Lessons from an attempt to facilitate freshman transition into college. *Journal of the American College Health Association*, 28(2), 79-81.
doi:10.1080/01644300.1979.10392898
- Baker, S. R. (2003). A prospective longitudinal investigation of social problem-solving appraisals on adjustment to university, stress, health, and academic motivation and performance. *Personality and Individual Differences*, 35(3), 569-591.
doi:10.1016/S0191-8869(02)00220-9
- Baker, S. R. (2004). Intrinsic, extrinsic, and motivational orientations: Their role in university adjustment, stress, well-being, and subsequent academic performance. *Current Psychology*, 23(3), 189-202. doi:10.1007/s12144-004-1019-9
- Balintulo, M. M. (2001). *Equity and Redress in the Transformation of South African Higher Education*. Paper presented at the Governance and Higher Education in Africa Conference, Center for African Studies, University of Florida. Retrieved from <http://www.web.africa.ufl.edu/events/Carter>
- Baloğlu, M. (2003). Individual differences in statistics anxiety among college students. *Personality and Individual Differences*, 34(5), 133-142. doi:10.1016/S0191-8869(02)00076-4
- Bandalos, D.L., Yates, K., & Thorndike-Christ, T. (1995). Effect of math self-concept, perceived self-efficacy, and attribution for failure and success on test anxiety. *Journal of Educational Psychology*, 87(4), 611-623. doi: 10.1037/0022-0663.87.4.611
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117–148.
- Barefoot, B. (2004). Higher education's revolving door: Confronting the problem of student drop out in US colleges and universities. *Open Learning, 19*(1), 9-18.
- Bargate, K. (1999). Mathematics as an indicator of success in first year accounting programmes at Technikon Natal. *South African Journal of Higher Education, 13*(1), 139-143.
- Barnes, V., Potter, E. H. III, & Fielder, F. E. (1983). Effect of interpersonal stress on the prediction of academic performance. *Journal of Applied Psychology, 68*(4), 686-697. doi:10.1037/0021-9010.68.4.686
- Barrios, A. A. (1997). *The Magic of the Mind (MOM) program for decreasing school dropout* (405436): U.S. Department of Education: Educational Resources Information Center.
- Bartels, K. (1995). *Psychosocial predictors of adjustment to the first year of college: A comparison of first-generation and SGCSs* (Unpublished doctoral dissertation). University of Missouri-Columbia, United States of America.
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological Science in the Public Interest, 4*(1), 1–44. doi:10.1111/1529-1006.01431
- BBC News. (2008, February 20). *£800m 'not cutting drop-out rate'*. [Press release]. Retrieved November 18, 2011, from http://news.bbc.co.uk/2/hi/uk_news/education/7252723.stm.
- Bean, A. N., & Hammer, D. P. (2006). *Perceived Stress Levels in University of Washington PharmD Students*. Paper presented at the annual meeting of the American Association

- of Colleges of Pharmacy. Retrieved November 14, 2011, from http://www.allacademic.com/meta/p119331_index.html
- Bean, J. P. (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. *Research in Higher Education, 12*(2), 155-187.
doi:10.1007/BF00976194
- Bean, J. P. (1982). Student attrition, intentions, and confidence: Interaction effects in a path model. *Research in Higher Education, 17*(4), 291-320. doi:10.1007/BF00977899
- Bean, J. P. (1985). Interaction effects based on class level in an explanatory model of college student dropout syndrome. *American Educational Research Journal, 22*(1), 35-64.
doi:10.2307/1162986
- Bean, J., & Eaton, S. H. (2001-2002). The Psychology Underlying Successful Retention Practices. *Journal of College Student Retention, 3*(1), 73-89. Retrieved May 2, 2013, from <http://homepages.se.edu/native-american-center/files/2012/04/The-Psychology-Underlying-Successful-Retention-Practice.pdf>
- Bean, J. P., & Metzner, B. S. (1985). A conceptual model of non-traditional undergraduate student attrition. *Review of Educational Research, 55*(4), 485-540. Retrieved from SAGE database.
- Beneke, J., & Beeming, C. (2011). Demographic profiling - a determination of academic performance in a Postgraduate Diploma in Marketing Management. *South African Journal of Higher Education, 25*(3), 444-459. Retrieved from Sabinet database.
- Benson, J., Bandalos, D., & Hutchinson, S. (1994). Modeling test anxiety among men and women. *Anxiety, Stress & Coping: An International Journal, 7*(2), 131-148. doi: 10.1080/10615809408249340
- Bentler, P.M. (1992). On the fit of models to covariances and methodology to the Bulletin. *Psychological Bulletin, 112*(3), 400-404.

- Berry, W.D., & Feldman, S. (1985). *Multiple Regression in Practice*. Sage University Paper series on Quantitative Applications in the Social Sciences, 07-050. Newbury Park, CA: Sage Publications, Inc.
- Betz, N.E. & Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college women and men. *Journal of Counseling Psychology, 28*(5), 399-410. doi: 10.1037/0022-0167.28.5.399
- Betz, N.E. & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the selections of science-based college majors. *Journal of Vocational Behavior, 23*(3), 329-345. doi: 10.1016/0001-8791(83)90046-5
- Beyers, W., & Goossens, L. (2002). Concurrent and predictive validity of the Student Adaption to COLlege Questionnaire in a sample of European freshman students. *Educational and Psychological Measurement, 62*(3), 527-538.
doi:10.1177/00164402062003009
- Biasco, F., Goodwin, E. A., & Vitale, K. L. (2001). College students' attitudes toward racial discrimination. *College Student Journal, 35*(4), 523–529.
- Billings, R.S., & Wroten, S.P. (1978). Use of Path Analysis in Industrial / Organizational Psychology: Criticisms and Suggestions. *Journal of Applied Psychology, 63*(6), 677-688.
- Bitzer, E., & Troskie-DeBruin, C. (2004). The effect of factors related to prior schooling on student persistence in higher education. *South African Journal of Education, 24*(2), 119-125. Retrieved from <http://www.ajol.info/index.php/saje/article/download/24976/20660>
- Blimling, G. S. (1999). A meta-analysis of the influence of college residence halls on academic performance. *Journal of College Student Development, 40*(5), 551- 561.
Retrieved from ERIC database.

- Blumberg, P., & Flaherty, J. A. (1985). The influence of non-cognitive variables on student performance. *Journal of Medical Education*, 60(9), 721–723.
- Bojuwoye, O. (2002). Stressful experiences of first year students of selected universities in South Africa. *Counselling Psychology Quarterly*, 15(3), 277-290.
doi:10.1080/09515070210143480
- Bordes, V., Sand, J. K., Arredondo, P., Kurpius, S. E. R., & Rayle, A. D. (2006). Validation of four measures of social support with Latina/o and non-Hispanic white undergraduates. *Hispanic Journal of Behavioral Sciences*, 28(1), 65-83.
doi:10.1177/0739986305283299
- Bornman, E. (1999). Self-image and ethnic identification in South Africa. *Journal of Social Psychology*, 139(4), 411-425. doi: 10.1080/00224549909598401
- Boss, P. G., Doherty, W. J., LaRossa, R., Schumm, W. R., & Steinmetz, S. K. (2008). *Sourcebook of Family Theories and Methods: A Contextual Approach*. Berlin, Germany: Springer Verlag.
- Botha, H. L. & Cilliers, C. D. (1999). Preparedness for university study: designing a thinking skills test. *South African Journal of Higher Education*, 13(1), 144-152.
- Bothma, A., Botha, H. L., & Le Roux, N. J. (2004). School results and access test results as indicators of first-year performance at university. *ORION*, 20(1), 73-88. Retrieved from <http://orion.journals.ac.za/pub/article/view/7/7>
- Boulter, L.T. (2002). Self-concept as a predictor of college freshman academic adjustment. *College Student Journal*, 36(2), 234-247. Retrieved from <http://www.freepatentsonline.com/article/College-Student-Journal/89809974.html>
- Boyer, E. L. (1987). *College: The undergraduate experience in America*. New York: Harper & Row.

- Boylan, H., Bonham, B., Claxton, C., & Bliss, L. (1992). *The state of the art in developmental education: Report of a national study*. Paper presented at the first national conference on Research in Developmental Education, Charlotte, NC.
- Braxton, J. M., Hirschy, A. S., & McClendon, S. A. (2004). *Understanding and reducing college student departure*. ASHE-ERIC Higher Education Reports, Vol. 30. San Francisco: Jossey Bass.
- Brown, S. D., Lent, R. W., & Larkin, K. C. (1989). Self-efficacy as a moderator of scholastic aptitude: Academic performance relationships. *Journal of Vocational Behavior*, 35(1), 64–75. doi:10.1016/0001-8791(89)90048-1
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 445-455). Newbury Park, CA: Sage.
- Buchler, M., Castle, J., Osman, R., & Walters, S. (2007). *Equity, Access and Success: Adult Learners in Public Higher Education*. Review of Higher Education in South Africa – Selected Themes (pp. 124-156). Council on Higher Education, Pretoria.
- Burton, N. W., & Ramist, L. (2001). *Predicting success in college: SAT studies of classes graduating since 1980*. *The College Board Research Report, 2001–2002*. New York: College Entrance Examination Board.
- Busch, T. (1995). Gender differences in self-efficacy and academic performance among students of business administration. *Scandinavian Journal of Educational Research*, 39(4), 311-318. Retrieved from http://www.toh.hist.no/~tor/forskning/se_sje.pdf
- Butler, R. (1998). Determinants of help seeking: Relations between perceived reasons for classroom help-avoidance and help-seeking behaviors in an experimental context. *Journal of Educational Psychology*, 90(4), 630-643. doi:10.1037//0022-0663.90.4.630

- Byars-Winston, A., Estrada, Y., Howard, C., Davis, D., & Zalapa, J. (2010). Influence of social cognitive and ethnic variables on academic goals of underrepresented students in science and engineering: A multiple-groups analysis. *Journal of Counselling Psychology, 57*(2), 205-218. doi:10.1037/a0018608
- Bye, D., Pushkar, D., & Conway, M. (2007). Traditional and Nontraditional Undergraduate Students. *Adult Education Quarterly, 57*(2), 141-158.
- Byrne, B. M. (2001). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.
- Byrne, B. M. (2004). Testing for Multigroup Invariance Using AMOS Graphics: A road Less Traveled. *Structural Equation Modeling: A Multidisciplinary Journal, 11*(2), 272-300. doi:10.1207/s15328007sem1102_8
- Cabrera, A. F., Castaneda, M. B., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. *Journal of Higher Education, 63*(2), 143-164. Retrieved from <http://www.jstor.org/stable/1982157>
- Cabrera, A. F., Nora, A., & Castaneda, M. B. (1993). College persistence: Structural Equations Modeling Test of an Integrated Model of Student Retention. *Journal of Higher Education, 64*(2), 123-139. Retrieved from <http://www.jstor.org/stable/2960026>
- Cabrera, L., Tomas, J., Álvarez, P. & Gonzalez, M. (2006). The problem of university dropout. *RELIEVE, 12*(2), 171-203. Retrieved from www.uv.es/RELIEVE/v12n2/RELIEVEv12n2_1eng.pdf
- Campbell, R. L., Svenson, L. W., & Jarvis, G. K. (1992). Perceived level of stress among university undergraduate students in Edmonton, Canada. *Perceptual and Motor Skills, 75*(2), 552-554. doi:10.2466/PMS.75.5.552-554

- Cantwell, R., Archer, J., & Bourke, S. (2001). A comparison of the academic experiences and achievement of university students entering by traditional and non-traditional means. *Assessment and Evaluation in Higher Education*, 26(3), 221–234.
doi:10.1080/02602930120052387
- Carney-Crompton, S., & Tan, J. (2002). Support systems, psychological functioning, and academic performance of nontraditional female students. *Adult Education Quarterly*, 52(2), 140-154. doi:10.1177/0741713602052002005
- Cassady, J. C. (2001). Self-reported GPA and SAT: A methodological note. *Practical Assessment, Research, & Evaluation*, 7(12). Retrieved February 26, 2013, from <http://pareonline.net/getvn.asp?v=7&n=12>
- Cassady, J. C. (2004). The impact of cognitive test anxiety on test comprehension and recall in the absence of external evaluative pressure. *Applied Cognitive Psychology*, 18(3), 311-325. doi:10.1002/acp.968
- Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology*, 27(2), 270-295. doi:10.1006/ceps.2001.1094
- Chambel, M. J., & Curral, L. (2005). Stress in academic life: Work characteristics as predictors of student well-being and performance. *Applied Psychology: An International Review*, 54(1), 135-147. doi:10.1111/j.1464-0597.2005.00200.x
- Chapell, M. S., Blanding, Z. B., Silverstein, M. E., Takahashi, M., Newman, B., Gubi, A., & McCann, N. (2005). Test anxiety and academic performance in undergraduate and graduate students. *Journal of Educational Psychology*, 97(2), 268-274.
doi:10.1037/0022-0663.97.2.268
- Charlton, J. P., Barrow, C., & Hornby-Atkinson, P. (2006). Attempting to predict withdrawal from higher education using demographic, psychological, and educational measures.

Research in Post-Compulsory Education, 11(1), 31–47.

doi:10.1080/13596740500507904

- Chartrand, J. M., Camp, C. C., & McFadden, K. L. (1992). Predicting academic adjustment and career indecision: A comparison of self-efficacy, interest congruence, and commitment. *Journal of College Student Development*, 33(4), 293-300.
- Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology*, 93(1), 55–64. doi: 10.1037//0022-0663.93.1.55
- Chisholm, L. (2004). Marking matrix: Overview of the debate. *HSRC Review*, 2, 6-7.
- Chittooran, M. M., & Miles, D. D. (2001). Test-taking skills for multiple-choice formats: Implications for school psychologists. Paper presented at the annual meeting of the National Association of School Psychologists, Washington, DC. Retrieved from ERIC database.
- Chow, H. P. H. (2007). Psychological well-being and scholastic achievement among university students in a Canadian Prairie City. *Social Psychology of Education*, 10(4), 483-493. doi:10.1007/s11218-007-9026-y
- Chowdhury, M. S., & Shahabuddin, A. M. (2007). Self-efficacy, motivation and their relationship to academic performance of Bangladesh college students. *College Quarterly*, 10(1), 1-9. Retrieved from ERIC database.
- Christie, N. G., & Dinham, S. M. (1991). Institutional and external influences on social integration in the freshman year. *Journal of Higher Education*, 62(4), 412-436. Retrieved from <http://www.jstor.org/stable/1982003>
- Church, A. T. (1982). Sojourner adjustment. *Psychological Bulletin*, 91(3), 540-572.

- Clark, E. J., & Rieker, P. P. (1986). Gender differences in the relationships and stress of medical and law students. *Journal of Medical Education*, 61(1), 32-40. Retrieved from MEDLINE database.
- Clark, W.A. (1993). *Identification of factors for reducing attrition of first time entering undergraduates at the University of Pretoria* (Unpublished doctoral thesis). University of Pretoria, South Africa.
- Clifton, R. A., Perry, R. P., Roberts, L. W., & Peter, T. (2008). Gender, Psychosocial Dispositions, and the Academic Achievement of College Students. *Research in Higher Education*, 49(8), 684-703. doi:10.1007/s11162-008-9104-9
- Cloete, N., Pillay, P., Badat, S., & Moja, T. (2004). *National Policy and Regional Response in South African Higher Education*. Cape Town, South Africa: David Philip Publisher.
- Coakley, J., & White, A. (1992). Making decisions: Gender and Sport Participation among British Adolescents. *Sociological Sport Journal*, 9(1), 20-35.
- Coetzee, L. R. (2011). *The relationship between students' academic self-concept, motivation and academic achievement at the university of the Free State* (Unpublished master's dissertation). University of the Free State, Bloemfontein, South Africa.
- Coffman, D. L., & Gilligan, T. D. (2002-2003). Social support, stress, and self-efficacy: Effects on students' satisfaction. *Journal of College Student Retention*, 4(1), 53-66. Retrieved from ERIC database.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health & Social Behaviour*, 24(4), 385-396. doi:10.2307/2136404
- Cokley, K., Bernard, N., Cunningham, D., & Motoike, J. (2001). A psychometric investigation of the academic motivation scale using a United States sample.

Measurement and Evaluation in Counseling and Development, 34(2), 109–119.

Retrieved from ERIC database.

Compas, B. E., Wagner, B. M., Slavin, L. A., & Vannatta, K. (1986). A prospective study of life events, social support, and psychological symptomatology during the transition from high school to college. *American Journal of Community Psychology*, 14(3), 241-257. doi:10.1007/BF00911173

Constantine, M. G., Anderson, G. M., Berkel, L. A., Caldwell, L. D., & Utsey, S. O. (2005). Examining the cultural adjustment experiences of African international college students. *Journal of Counseling Psychology*, 52(1), 57-66. doi:10.1037/0022-0167.52.1.57

Constantine, M. G., Wilton, L., & Caldwell, L. D. (2003). The role of social support in moderating the relationship between psychological distress and willingness to seek psychological help among Black and Latino college students. *Journal of College Counseling*, 6(2), 155-165. doi:10.1002/j.2161-1882.2003.tb00236.x

Conti, R. (2000). College goals: Do self-determined and carefully considered goals predict intrinsic motivation, academic performance, and adjustment during the first semester? *Social Psychology of Education*, 4(2), 189-211. doi:10.1023/A:1009607907509

Council on Higher Education. (2004). *South African Higher Education in the First Decade of Democracy*. Pretoria, South Africa: Council on Higher Education.

Council on Higher Education. (2009). *Executive Summary – Audit Report on the University of Fort Hare*. Retrieved May 11, 2010, from http://www.che.ac.za/auditing/instaudited/reports/UFH_Exec_Summary_October2009.pdf

Council on Higher Education. (2010). Access and throughput in South African Higher Education: Three case studies. *Higher Education Monitor*, 9, 1-218.

- Council on Higher Education. (2012). *VitalStats Public Higher Education 2010*. Retrieved April 29, 2013, from http://www.che.ac.za/documents/d000249/vital_stats_public_higher_education_2010.pdf
- Council on Higher Education. (2011). *Council on higher education and higher education quality committee*. Retrieved January 16, 2012, from <http://www.che.ac.za/heinsa>
- Crawford, L. (1999). *Extended opportunity programs and services for community college retention*. Paper presented at the Annual California Community Colleges Chancellor's Office State-wide Conference, Monterey, CA. Retrieved from <http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED429642>
- Crede, M., & Niehorster, S. (2012). Adjustment to College as Measured by the Student Adaption to College Questionnaire: A Quantitative Review of its Structure and Relationships with Correlates and Consequences. *Educational Psychology Review*, 24(1), 133-165. doi:10.1007/s10648-011-9184-5
- Crocker, J., & Luhtanen, R. K. (2003). Level of self-esteem and contingencies of self-worth: Unique effects on academic, social, and financial problems in college students. *Personality and Social Psychology Bulletin*, 29(6), 701-712. doi:10.1177/0146167203029006003
- Crocker, L., Schmitt, A. P., & Tang, L. (1988). Test anxiety and standardized achievement test performance in the middle school years. *Measurement and Evaluation in Counseling and Development*, 20(4), 149-157. Retrieved from ERIC database.
- Cross, Y., Shalem, J., & Backhouse, F. A. (2009). How undergraduate students negotiate academic performance within a diverse university environment. *South African Journal of Higher Education*, 23(1), 21-42. Retrieved from Sabinet database.

- Cutrona, C. E., Cole, V., Colangelo, N., Assouline, S. G., & Russell, D. W. (1994). Perceived parental social support and academic achievement: An attachment theory perspective. *Journal of Personality and Social Psychology*, 66(4), 369-378. doi:10.1037/0022-3514.66.2.369
- d'Hombres, B. (2007). *The Impact of university reforms on dropout rates and student status: Evidence from Italy*. Office for Official Publications of the European Communities. Retrieved November 18, 2011, from <http://crell.jrc.ec.europa.eu/Publications/CRELL%20Research%20Papers/The%20impact%20of%20university%20reforms%20on%20dropout%20rates.pdf>
- Dadfar, S., & Friedlander, M. L. (1982). Differential attitudes of international students toward seeking professional psychological help. *Journal of Counseling Psychology*, 29(3), 335-338. doi:10.1037/0022-0167.29.3.335
- Davidowitz, B., & Rollnick, M. (2005). Improving Performance in a Second Year Chemistry Course: An Evaluation of a Tutorial Scheme on the Learning of Chemistry. *South African Journal of Chemistry*, 58, 138-143. Retrieved from Sabinet database.
- Davidowitz, B., & Schreiber, B. (2008). Facilitating adjustment to higher education: Towards enhancing functioning in an Academic Development Programme. *South African Journal for Higher Education*, 22(1), 191-206.
- Davidson-Katz, K. (1991). Gender roles and health. In C. R. Snyder & R. D. Donelson (Eds.), *Handbook of social and clinical psychology: The health perspectives*, (pp. 179-196). New York: Pergamon Press.
- Davis, E. R. (1988). *The effects of the life development intervention model on freshman and transfer student-athletes*. (Doctoral dissertation, Virginia Commonwealth University, 1988). *Dissertation Abstracts International*, 50, 3149B. Retrieved from First Search/Dissertation Abstracts International database.

- Davy, J. A., Smith, K. J., & Rosenberg, D. L. (2009). Motivation and (Un)Ethical Behavior: Are There Gender Differences? *Forum on Public Policy: A Journal of the Oxford Round Table*, 5(2), 1-25.
- Dawes, P., Yeld, N., & Smith, M. J. (1999). Access, selection and admission to higher education: Maximizing the use of the school leaving examination. *South African Journal of Higher Education*, 13(3), 97-104. Retrieved from Sabinet database.
- Dayioğlu, M., & Türüt-Aşık, S. (2007). Gender differences in academic performance in a large public university in Turkey. *Higher Education*, 53(2), 255–277.
doi:10.1007/s10734-005-2464-6
- De Boer, A. L., & van Rensburg, M. C. J. (1997). Underprepared students in the faculty of arts: Burden or boon? A preliminary report. *South African Journal of Ethnology*, 20, 159-164.
- De Raad, B. (1996). Personality traits in learning and education. *European Journal of Personality*, 10(3), 185–200. doi:10.1002/(SICI)1099-0984(199609)10:3<185::AID-PER256>3.0.CO;2-M
- De Villiers, A. B. (1999). *Disadvantaged students' academic performance: Analyzing the zone of proximal development* (Unpublished doctoral thesis). University of Cape Town, South Africa.
- Dean, A., & Lin, N. (1977). The stress-buffering role of social support. *Journal of Nervous and Mental Disease*, 165, 403-417. Retrieved from MEDLINE database.
- DeBerard, M. S., Spielmans, G. I., & Julka, D. L. (2004). Predictors of academic achievement and retention among college freshmen: A longitudinal study. *College Student Journal* 38(1), 66-80.
- Deci, E. L., & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

- Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska symposium on motivation: Vol 38, Perspectives on motivation* (pp. 237-288). Lincoln: University of Nebraska Press.
- Deci, E. L., & Ryan, R. M. (1995). Human autonomy: The basis for true self-esteem. In M. Kernis (Ed.), *Efficacy, agency, and self-esteem* (pp. 31-49). New York: Plenum Publishing Co.
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268. Retrieved from http://www.selfdeterminationtheory.org/SDT/documents/2000_DeciRyan_PIWhatWhy.pdf
- Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26*(3), 325-346.
- Deckro, G. R., Ballinger, K. M., Hoyt, M., Wilcher, M., Dusek, J., Myers, P., Greenberg, B., Rosenthal, D. S., & Benson, H. (2002). The evaluation of a mind/body intervention to reduce psychological distress and perceived stress in college students. *Journal of American College Health, 50*(6), 281-287. doi:10.1080/07448480209603446
- Demakis, G. J., & McAdams, D. P. (1994). Personality, social support, and well-being among first year college students. *College Student Journal, 28*(2), 235-242.
- Dennis, J. M., Phinney, J. S., & Chuateco, L. I. (2005). The role of motivation, parental support, and peer support in the academic success of ethnic minority first-generation college students. *Journal of College Student Development, 46*(3), 223-236. doi:10.1353/csd.2005.0023

- Department of Education. (2001, February). *National Plan for Higher Education in South Africa*. Retrieved July 15, 2008, from <http://www.education.gov.za/Documents/policies/NationalPlanHE2001.pdf>
- Department of Education. (2005). *Education Statistics in South Africa at a Glance in 2004*. Pretoria, South Africa: Department of Education.
- Department of Education. (2006). *Funding for foundational provisions in formally approved programmes: 2007/08 to 2009/10*. Pretoria, South Africa: Department of Education.
- Department of Higher Education and Training. (2010). *Annual Report 2010/2011*. Pretoria, South Africa: Department of Higher Education and Training.
- Department of Higher Education and Training. (2013). *Statistics on Post-School Education and Training in South Africa: 2011*. Pretoria, South Africa: Department of Higher Education and Training.
- Department of Science and Technology. (2012). *Draft Strategy For Human Capital Development For Research Innovation And Scholarship*. Pretoria, South Africa: Department of Science and Technology.
- DeStefano, T. J., Mellott, R. N., & Petersen, J. D. (2001). A preliminary assessment of the impact of counseling on student adjustment to college. *Journal of College Counseling, 4*(2), 113-121. doi:10.1002/j.2161-1882.2001.tb00191.x
- DeWitz, S. J., & Walsh, W. B. (2002). Self-efficacy and college student satisfaction. *Journal of Career Assessment, 10*(3), 315-326. doi:10.1177/10672702010003003
- Di Paula, A., & Campbell, J. D. (2002). Self-esteem and persistence in the face of failure. *Journal of Personality and Social Psychology, 83*(3), 711-724. doi:10.1037/0022-3514.83.3.711

- Dickter, D. (2006). Basic Statistical Analysis. In F. T. L. Leong & J. T. Austin (Eds.), *The Psychology Research Handbook*. Retrieved June 14, 2011, from http://0-www.sage-reference.com.oasis.unisa.ac.za/hdbk_psychrsch/Article_n19.html.
- Didier, T., Kreiter, C., Buri, R., & Solow, C. (2006). Investigating the utility of a GPA institutional adjustment index. *Advances in Health Science Education, 11*(2), 145–153. doi:10.1007/s10459-005-0390-0
- Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology, 68*(4), 653–663. doi:10.1037/0022-3514.68.4.653
- Dlomo, Z., Jansen, A., Moses, M., & Yu, D. (2011). Investigating the significance of the 2008 Matric curriculum on first-year Economics performance. *South African Journal of Higher Education, 25*(4), 696-709.
- Dolado, J. J., & Morales, E. (2007). Which Factors Determine Academic Performance of Undergraduate Students in Economics?: Some Spanish Evidence. *Documento de Trabajo, 23*, 1-19. Retrieved from <http://www.fedea.es/pub/Papers/2007/dt2007-23.pdf>
- Douglas, K. (2013). *Africa needs more skilled engineers, says research*. Retrieved May 15, 2013, from <http://www.howwemadeitinafrica.com/africa-needs-more-skilled-engineers-says-research/25382/>
- Downs, C. T. (2009). Academic performance and pass rates: Comparison of three first-year life science courses. *South African Journal of Higher Education, 23*(4), 656-673.
- Du Prè, R. (2003). *Coping with change in higher education in South Africa*. Retrieved July 20, 2008, from <http://www.face.stir.ac.uk/documents/Paper101-RoyduPreR.pdf>.
- Du Rand, P. P. (1998). *'n Ontwikkeling en ondersteuningsprogram vir swart eerstejaar-studente in verpleegkunde* [A developmental and support programme for black first-

- year nursing students] (Unpublished doctoral dissertation). University of the Orange Free State, Bloemfontein, South Africa.
- DuBois, D. L., Bull, C. A., Sherman, M. D., & Roberts, M. (1998). Self-esteem and adjustment in early adolescence: A social-contextual perspective. *Journal of Youth and Adolescence, 27*(5), 557–583. doi:10.1023/A:1022831006887
- Duck9.com (2007). *Statistics on Collegiate Drop Out Rates - Q4 2007 Statistics on College Student Drop Out Rates*. Retrieved November 20, 2011, from <http://www.duck9.com/College-Student-Drop-Out-Rates.htm>.
- Durkheim, E. (1961). *Suicide*. Glencoe: The Free Press.
- Dyson, R., & Renk, K. (2006). Freshmen adaptation to university life: depressive symptoms, stress, and coping. *Journal of Clinical Psychology, 62*(10), 1231-1244. doi:10.1002/jclp.20295
- Eduloan. (2008). *South Africa's High University Dropout Rates: Why and What Can Be Done?* Retrieved February 14, 2012, from http://www.eduloan.co.za/news/south_africas_high_university_dropout_rates_why_and_what_can_be_done/?a=1.
- Eldeleklioglu, J. (2006). The relationship between the perceived social support and the level of depression and anxiety in university students. *Educational Sciences: Theory & Practice, 6*(3), 742-752.
- Elias, S. M., & Loomis, R. J. (2000). Using an academic self-efficacy scale to address university major persistence. *Journal of College Student Development, 41*(4), 450–454.
- Enochs, W. K., & Roland, C. B. (2006). Social adjustment of college freshmen: the importance of gender and living environment. *College Student Journal, 40*(1), 63-72.

- Ensor, P. (2002). Curriculum. In N. Cloete, R. Fehnel, P. Maassen, T. Moja, H. Perold, & T. Gibbon (Eds.), *Transformation in Higher Education: Global pressures and local realities* (pp. 270-295). Cape Town: Juta Academic Press.
- Erbe, B. (2007). Reducing test anxiety while increasing learning. The cheat sheet. *College Teaching*, 55(3), 96-97. doi:10.3200/CTCH.55.3.96-98
- Etcheverry, E., Clifton, R. A., & Roberts, L. W. (2001). Social capital and educational attainment: A study of undergraduates in a faculty of education. *Alberta Journal of Educational Research*, 47(1), 24–39. Retrieved from <http://ajer.synergiesprairies.ca/ajer/index.php/ajer/article/download/239/231>
- Everson, H. T., Millsap, R. E., & Rodriguez, C. M. (1991). Isolating gender differences in test anxiety: A confirmatory factor analysis of the Test Anxiety Inventory. *Educational and Psychological Measurement*, 51(1), 243–251. doi:10.1177/0013164491511024
- Fairchild, A. J., Horst, S. J., Finney, S. J., & Barron, K. E. (2005). Evaluating existing and new validity evidence for the Academic Motivation Scale. *Contemporary Educational Psychology*, 30(3), 331-358. doi:10.1016/j.cedpsych.2004.11.001
- Faley, B. A. (2010). Cognitive test anxiety and learning outcomes of selected undergraduate students. *The African Symposium*, 10(2), 69-74. Retrieved from www.ncsu.edu/aern/TAS10.2/TAS10.2.pdf
- Farsides, T., & Woodfield, R. (2007). Individual and gender differences in good and first-class undergraduate degree performance. *British Journal of Psychology*, 98(3), 467–483. doi:10.1348/000712606X150246
- Feingold, A. (1994). Gender Differences in Personality: A Meta analysis. *Psychological Bulletin*, 116(3), 429-456. doi:10.1037/0033-2909.116.3.429

- Felsten, G., and Wilcox, K. (1992). Influences of stress and situation-specific mastery beliefs and satisfaction with social support on well-being and academic performance. *Psychological Reports, 70*(1), 291–303. doi:10.2466/pr0.1992.70.1.291
- Fenollar, P., Roman, S., & Cuestas, P. J. (2007). University students' academic performance: An integrative conceptual framework and empirical analysis. *British Journal of Educational Psychology, 77*(4), 873-891. doi:10.1348/000709907X189118
- Fergusson, D. M., & Horwood, L. J. (1997). Gender differences in educational achievement in a New Zealand birth cohort. *New Zealand Journal of Educational Studies, 32*(1), 83-96. Retrieved from <http://www.otago.ac.nz/christchurch/otago014782.pdf>
- Ferla, J., Valcke, M., & Cai, Y. (2009). Academic self-efficacy and academic self-concept: Reconsidering structural relationships. *Learning and Individual Differences, 19*(4), 499-505. doi:10.1016/j.lindif.2009.05.004
- Finn, K. V., & Frone, M. R. (2004). Academic performance and cheating: Moderating role of school identification and self-efficacy. *Journal of Educational Research, 97*(3), 115-122. doi:10.3200/JOER.97.3.115-121
- Fischer, E. H., & Farina, A. (1995). Attitudes toward seeking professional psychological help: A shortened form and considerations for research. *Journal of College Student Development, 36*(4), 368-373.
- Fisher, S. (1994). *Stress in academic life: The mental assembly line*. Buckingham, England: SRHE and Open University Press.
- Fiske, E. B., & Ladd, H. F. (2004). *Elusive equity: Education reform in post-apartheid South Africa*. Washington, DC: Brookings Institution Press.
- Fleming, J. (1981). Stress and satisfaction in college years of Black students. *The Journal of Negro Education, 50*(3), 307-318. Retrieved from <http://www.jstor.org/stable/2295160>

- Forsyth, D. R., Lawrence, N. K., Burnette, J. L., & Baumeister, R. F. (2007). Attempting to improve the academic performance of struggling College students by bolstering their self-esteem: An intervention that backfired. *Journal of Social and Clinical Psychology, 26*(4), 447-459. doi:10.1521/jscp.2007.26.4.447
- Fortier, M. S., Vallerand, R. J., & Guay, F. (1995). Academic Motivation and School Performance: Toward a Structural Model. *Contemporary Educational Psychology, 20*(3), 257-274. doi:10.1006/ceps.1995.1017
- Fraser, W., & Killen, R. (2005). The perceptions of students and lecturers of some factors influencing academic performance at two South African universities. *Perspectives in Education, 23*(1), 25-40.
- Friedlander, J. (1980). Are college support programs and services reaching high-risk students? *Journal of College Student Personnel, 21*(1), 23-28.
- Friedlander, L. J., Reid, G. J., Shupak, N., & Cribbie, R. (2007). Social support, self-esteem, and stress as predictors of adjustment to university among first-year undergraduates. *Journal of College Development, 48*(3), 259-274. doi:10.1353/csd.2007.0024
- Furnham, A., & Andrew, R. (1996). A cross-cultural study of attitudes towards seeking psychological help. *Psychological Reports, 79*(1), 289-290.
- Furnham, A., Chamorro-Premuzic, T., & McDougall, F. (2002). Personality, cognitive ability, and beliefs about intelligence as predictors of academic performance. *Learning and Individual Differences, 14*(1), 47-64. doi:10.1016/j.lindif.2003.08.002
- Gabara, N. (2010). *Pandor – SA needs to train more young scientists*. Retrieved May 15, 2013, from <http://www.skillsportal.co.za/page/education/670740-Pandor-SA-needs-to-train-more-young-scientists>

- Gall, T. L., Evans, D. R., and Bellerose, S. (2000). Transition to first-year university: patterns of change in adjustment across life domains and time. *Journal of Social and Clinical Psychology* 19(4): 544–567. doi:10.1521/jscp.2000.19.4.544
- Garcia, T., & Pintrich, P. R. (1996). Assessing students' motivation and learning strategies in the classroom context: The Motivated Strategies for Learning Questionnaire. In M. Birenbaum & F. J. R. C. Dochy (Eds.), *Alternatives in assessment of achievements, learning processes and prior knowledge: Evaluation in education and human services* (pp. 319-339). Boston: Kluwer Academic.
- Garson, G.D. (2011). *Path Analysis*. Retrieved June 22, 2011, from <http://faculty.chass.ncsu.edu/garson/PA765/path.htm>.
- Gaudry, E., & Spielberger, C. D. (1971). *Anxiety and educational achievement*. New York: Wiley.
- Gentile, B., Grabe, S., Dolan-Pascoe, B., Twenge, J. M., Wells, B. E., & Maitino, A. (2009). Gender differences in domain-specific self-esteem: A meta-analysis. *Review of General Psychology*, 13(1), 34-45. doi:10.1037/a0013689
- Gerdes, H., & Mallinckrodt, B. (1994). Emotional, social, and academic adjustment of college students: A longitudinal study of retention. *Journal of Counseling and Development*, 72(3), 281-288. doi:10.1002/j.1556-6676.1994.tb00935.x
- Gierl, M. J., & Rogers, W. T. (1996). A confirmatory factor analysis of the Test Anxiety Inventory using Canadian high school students. *Educational and Psychological Measurement*, 56(2), 315–324. doi:10.1177/0013164496056002012
- Gillock, K. L., & Reyes, O. (1999). Stress, support, and academic performance of urban, low-income, Mexican-American adolescents. *Journal of Youth and Adolescence* 28(2), 259-282. doi:10.1023/A:1021657516275

- Gloria, A. M., Kurpius, S. E. R., Hamilton, K. D., & Willson, M. S. (1999). African American students' persistence at a predominantly white university: Influences of social support, university comfort, and self-beliefs. *Journal of College Student Development, 40*(3), 257-268.
- Goldman, B. A., Flake, W. L., & Matheson, M. B. (1990). Accuracy of college students' perceptions of their SAT scores, high school and college grade point averages relative to their ability. *Perceptual and Motor Skills, 70*(2), 514. doi:10.2466/PMS.70.2.514-514
- Goldman, D. (2012, May 13). For stressed college students, a doggone good way to relax. *USA Today*. Retrieved from <http://usatoday30.usatoday.com/news/education/story/2012-05-13/dogs-stress-relief-on-campus/54921444/1>.
- Good, J., Halpin, G., & Halpin, G. (2002). Retaining black students in engineering: Do minority programs have a longitudinal impact? *Journal of College Student Retention: Research, Theory & Practice, 3*(4), 351-364. doi: 10.2190/A0EU-TF7U-RUYN-584X
- Goodman, S., Jaffer, T., Keresztesi, M., Mamdani, F., Mokgatle, D., Musariri, M., Pires, J., & Schlechter, A. (2011). An investigation of the relationship between students' motivation and academic performance as mediated by effort. *South African Journal of Psychology, 41*(3), 373-385.
- Gore, A., Jr., Leuwerke, W. C., & Turley, S. E. (2005–2006). A psychometric study of the college self-efficacy inventory. *Journal of College Student Retention: Research, Theory, & Practice, 7*(3), 227–244. doi:10.2190/5CQF-F3P4-2QAC-GNVJ
- Graff, R. W. & Cooley, G. R. (1970). Adjustment of commuter and resident students. *Journal of College Student Personnel, 11*(1), 54-56.

- Graham, S., & Donaldson, J. (1996). Assessing the personal growth for adults enrolled in higher education. *Journal of Continuing Higher Education, 44*(2), 7-22.
doi:10.1080/07377366.1996.10400954
- Grant-Vallone, E., Reid, K., Umali, C., & Pohlert, E. (2003-2004). An analysis of the effects of self-esteem, social support, and participation in student support services on students' adjustment and commitment to college. *Journal of College Student Retention, 5*(3), 255-274. doi:10.2190/C0T7-YX50-F71V-00CW
- Greer, T. M. (2008). Racial and ethnic-related stressors as predictors of perceived stress and academic performance for African American students at historically black college and university. *The Journal of Negro Education, 77*(1), 60-71. Retrieved from <http://www.jstor.org/stable/40034678>
- Greer, T. M., & Chwalisz, K. (2007). Minority-related stressors and coping processes among African American college students. *Journal of College Student Development, 48*(4), 388-404. doi:10.1353/csd.2007.0037
- Grimes, S. K. (1997). Under-prepared Community College Students: Characteristics, persistence, and Academic Success. *Community College Journal of Research & Practice, 21*(1), 47-56. doi:10.1080/1066892970210105
- Hackett, G. (1985). The role of mathematics self-efficacy in the choice of math-related majors of college women and men: A path analysis. *Journal of Counseling Psychology, 32*(1), 47-56. doi:10.1037/0022-0167.32.1.47
- Hackett, G., Betz, N. E., Casas, J. M., & Rocha-Singh, I. A. (1992). Gender, ethnicity, and social cognitive factors predicting the academic achievement of students in engineering. *Journal of Counseling Psychology, 39*(4), 527-538. doi:10.1037//0022-0167.39.4.527

- Halamandaris, K. F., & Power, K. G. (1997). Individual differences, dysfunctional attitudes and social support: a study of the psychosocial adjustment to university life of home students. *Personality and Individual Differences*, 22(1), 93–104. doi:10.1016/S0191-8869(96)00175-4
- Halamandaris, K. F., & Power, K. G. (1999). Individual differences, social support and coping with the examination stress: A study of the psychosocial and academic adjustment of first year home students. *Personality and Individual Differences*, 26(4), 665-685. doi:10.1016/S0191-8869(98)00172-X
- Hancock, D. R. (2001). Effects of test anxiety and evaluative threat on students' achievement and motivation. *The Journal of Educational Research*, 94(5), 284- 290.
doi:10.1080/00220670109598764
- Hancock, G. R., & Mueller, R. O. (2003). Path Analysis. In M. S. Lewis-Beck, A. Bryman, & T. F. Liao (Eds.), *Encyclopedia of Social Science Research Methods*. Retrieved June 14, 2011, from http://0-www.sage-reference.com.oasis.unisa.ac.za/socialscience/Article_n696.html.
- Harman, K., & Meek, L. V. (2002). Introduction to special issue: Merger revisited: International perspectives on mergers in higher education. *Higher Education*, 44(1), 1-4. doi:10.1023/A:1015598525413
- Harrell, S. P., Myers, H. F., & Smedley, B. D. (1993). Minority-status stresses and the college adjustment of ethnic minority freshmen. *Journal of Higher Education*, 64(4), 434-452. Retrieved from <http://www.jstor.org/stable/2960051>
- Harter, S. (1993). Causes and consequences of low self-esteem in children and adolescents. In R. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp. 87-111). New York: Plenum Press.

- Haynes, N. M. (1990). Influence of self-concept on school adjustment among middle-school students. *Journal of Social Psychology, 130*(2), 199–207.
doi:10.1080/00224545.1990.9924570
- Heath Gilmore Higher Education. (2009). *Nearly 20% of university students don't last full year*. Retrieved November 18, 2011, from <http://www.smh.com.au/national/nearly-20-of-university-students-dont-last-full-year-20091205-kbj.html>.
- Hembree, R. (1988). Correlates, causes, effects, and treatment of test anxiety. *Review of Educational Research, 58*(1), 47-77. Retrieved from <http://www.jstor.org/stable/1170348>
- Heppner, P. P., & Anderson, W. P. (1985). The relationship between problem solving self-appraisal and psychological adjustment. *Cognitive Therapy and Research, 9*(4), 415–427. doi:10.1007/BF01173090
- Hertel, J. B. (2002). College student generational status: Similarities, differences, and factors in college adjustment. *The Psychological Record, 52*, 3-18. Retrieved from http://istanbul2004.ku.edu.tr/bademir/public_html/soci%20201/12.pdf
- Hinderlie, H. H., & Kenny, M. (2002). Attachment, social support, and college adjustment among Black students at predominantly White universities. *Journal of College Student Development, 43*(3), 327-340.
- Hojat, M., Callahan, C. A., & Gonnella, J. S. (2004). Students' personality and rating of clinical competence in medical school clerkships: A longitudinal study. *Psychology, Health, & Medicine, 9*(2), 247-252. doi:10.1080/13548500410001670771
- Holahan, C. J., Valentiner, D. P., & Moos, R. H. (1995). Parental support, coping strategies, and psychological adjustment: An integrative model with late adolescents. *Journal of Youth and Adolescence, 24*(6), 633-648. doi:10.1007/BF01536948

- Holder, G.M., Jones, J., Robinson, R.A., & Krass, I. (1999). Academic literary skills and progression rates amongst pharmacy learners. *Higher Education Research & Development, 18*(1), 19-29. doi:10.1080/0729436990180103
- Hoover, K. G. (2003). The relationship of locus of control and self-efficacy to academic achievement of first-year students. *Journal of the First-Year Experience & Students in Transition, 15*(2), 103–123. Retrieved from <http://fyesit.metapress.com/content/dp42612735354k00/>
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55. doi:10.1080/10705519909540118
- Hudd, S., Dumlao, J., Erdman-Sager, D., Murray, D., Phan, E., Soukas, N., & Yokozuna, N. (2000). Stress at college: effects on health habits, health status, and self-esteem. *College Student Journal, 34*(2), 217-227. Retrieved from PsycINFO database.
- Hunsberger, B., Pancer, S. M., Pratt, M., & Alisat, S. (1996). The transition to university: Is religion related to adjustment? *Research in the Social Scientific Study of Religion, 7*, 181-199.
- Hurtado, S., Carter, D. F., & Spuler, A. (1996). Latino student transition to college: assessing difficulties and factors in successful college adjustment. *Research in Higher Education, 37*(2), 135-157. doi:10.1007/BF01730113
- Huysamen, G. K. (1999). Psychometric explanations for the poor predictability of the tertiary-academic performance of educationally disadvantaged students. *South African Journal of Higher Education, 13*(1), 132-138.
- Huysamen, G. K. (2000). The differential validity of matriculation and university performance as predictors of post-first-year performance. *South African Journal of Higher Education, 14*(1), 146-151. Retrieved from Sabinet database.

- Huysamen, G. K. (2002). Mark non-comparability and the predictability of post-first-year performance. *Acta Academica*, 34(3), 111-128. Retrieved from Sabinet database.
- Hyde, J. S., & Kling, K. C. (2001). Women, motivation and achievement. *Psychology of Women Quarterly*, 25(4), 364-378. doi:10.1111/1471-6402.00035
- International Education Association of South Africa. (2011). *Higher Education in Context. In leaps and bounds: Growing higher education in South Africa*. Retrieved February 25, 2013, from http://www.ieasa.studysa.org/resources/Study_SA_11/In%20leaps%20and%20bounds%20Growing.pdf
- Ishitani, T. T., & DesJardins, S. L. (2002-2003). A longitudinal investigation of dropout from college in the United States. *Journal of College Student Retention: Research, Theory & Practice*, 4(2), 173-201. doi: 10.2190/V4EN-NW42-742Q-2NTL
- Isiksal, M. (2010). A Comparative Study on Undergraduate Students' Academic Motivation and Academic Self-Concept. *Spanish Journal of Psychology*, 13(2), 572-585. Retrieved from MEDLINE database.
- Jackson, T., Fritch, A., Nagasaka, T., & Gunderson, J. (2002). Towards explaining the association between shyness and loneliness: A path analysis with American college students. *Social Behavior and Personality: An International Journal*, 30(2), 263–270. doi:10.2224/sbp.2002.30.3.263
- Jacobson, R. R. (2000). Differences between traditional and nontraditional students on the Motivated Strategies for Learning Questionnaire. *Dissertations Abstracts International*, 61(3-A), 879. Retrieved from ProQuest Dissertations & Theses database.
- Jansen, J. D. (2002). *Mergers in Higher Education: Lessons Learned in Transitional Contexts*. Pretoria: University of South Africa Press.

- Jansen, J., Herman, C., Matentjie, T., Morake, R., Pillay, V., Schoole, C., & Weber, E. (2007). *Tracing and Explaining Change in Higher Education: The South African Case*. Review of Higher Education in South Africa: Selected Themes, (pp. 157-188). Council on Higher Education.
- Jawitz, J. (1995). Performance in first- and second-year engineering at UCT. *South African Journal of Higher Education*, 9(1), 101-108.
- Jay, G. M., & D'Augelli, A. R. (1991). Social support and adjustment to university life: A comparison of african-american and white freshmen. *Journal of Community Psychology* 19(2), 95-108. doi:10.1002/1520-6629(199104)19:2<95::AID-JCOP2290190202>3.0.CO;2-2
- Jdaitawi, M. T., Ishak, N. A., & Mustafa, F. T. (2011). Emotional intelligence in modifying social and academic adjustment among first year university students in North Jordan. *International Journal of Psychological Studies*, 3(2), 135-141.
- Jeffrey, L. M., Atkins, C., Laurs, A., & Mann, S. (2009). E-Learner Profiles: Identifying Trends and diversity in student needs, orientations and aspirations. Executive Summary. Retrieved June 11, 2012, from <http://www.educationcounts.govt.nz/publications/ict/57985>.
- Jing, H. E. (2007). Analysis on the relationship among test anxiety, self-concept and academic competency. *US-China Foreign Language*, 5(1), 48-51.
- Jobson, J. D. (1991). *Applied Multivariate Data Analysis. Volume 1. Regression and Experimental Design*. New York: Springer Verlag.
- Johnson, A. R. (2001). *Optimism, college adjustment, and campus resources*. Unpublished master's thesis, University of Kansas, Lawrence.
- Johnson, V. E. (2003). *Grade inflation: A crisis in college education*. New York: Springer-Verlag.

- Jones, B., Coetzee, G., Bailey, T., & Wickham, S. (2008). *Factors that facilitate success for disadvantaged higher education students: An investigation into approaches used by REAP, NSFAS and selected higher education institutions*. Cape Town: Rural Education Access Programme (REAP) & Research and Academic Development (RAD).
- Justice, E. M., & Dornan, T. M. (2001). Metacognitive Differences Between Traditional-Age And Nontraditional-Age College Students. *Adult Education Quarterly*, 51(3), 236-249. doi:10.1177/074171360105100305
- Kaczmarek, P. G., Matlock, G., Merta, R., Ames, M. H., & Ross, M. (1994). An assessment of international college student adjustment. *International Journal for the Advancement of Counselling*, 17(4), 241-247. doi:10.1007/BF01407740
- Kagee, A., Naidoo, T., & Mahatey, N. (1997). Theoretical underpinnings of a student mentoring programme at an historically black university in South Africa. *International Journal for the Advancement of Counselling*, 19(3), 249–258. doi:10.1007/BF00115680
- Kahn, J. H., & Nauta, M. M. (2001). Social-cognitive predictors of first-year college persistence: The importance of proximal assessment. *Research in Higher Education*, 42(6), 633-652. doi:10.1023/A:1012225510213
- Kantanis, T. (1995). The role of social transition in students' adjustment to the first-year of university. *Journal of Institutional Research*, 9(1), 100-110.
- Karabenick, S. A., & Knapp, J. R. (1988). Help seeking and the need for academic assistance. *Journal of Educational Psychology*, 80(3), 406–408.
- Karabenick, S. A., & Knapp, J. R. (1991). Relationship of academic help seeking to the use of learning strategies and other instrumental achievement behaviour in college

- students. *Journal of Educational Psychology*, 83(2), 221-230. doi:10.1037/0022-0663.83.2.221
- Karsenti, T., & Thibert, G. (1994). *The influence of gender on within-term changes in junior college student motivation*. Paper presented at the American Educational Research Association, New Orleans, Louisiana. Retrieved from <http://karsenti.scedu.umontreal.ca/pdf/scholar/ARS-karsenti-1-1995.pdf>
- Kasworm, C. (2003). Adult meaning making in the undergraduate classroom. *Adult Education Quarterly*, 53(2), 81-98. doi:10.1177/0741713602238905
- Kaufman, J. C., Agars, M. D., & Lopez-Wagner, M. C. (2008). The role of personality in predicting early college academic success in non-traditional students at a Hispanic-serving institution. *Learning and Individual Differences*, 18(4), 492-496. doi:10.1016/j.lindif.2007.11.004
- Keleş, H. N. (2012). An investigation of the relationship between motivation and academic achievement of business administration students: An empirical study in Turkey. *European Journal of Social Sciences*, 30(4), 612-617.
- Kember, D., & Harper, G. (1987). Implications for instruction arising from the relationship between approaches to studying and academic outcomes. *Instructional Science*, 16(1), 35-46. doi:10.1007/BF00120004
- Kennedy, E. (1997). A study of students' fears of seeking academic help from teachers. *Journal of Classroom Interaction*, 32, 11-17.
- Klein, J. D. (1990). An analysis of the motivational characteristics of college reentry students. *College Student Journal*, 24(3), 281-286. Retrieved from PsycINFO database.
- Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press.

- Kling, C. K., Hyde, J. S., Showers, C. J., & Buswell, B. N. (1999). Gender differences in self-esteem: A meta-analysis. *Psychological Bulletin*, *125*(4), 470-500. Retrieved from PsycINFO database.
- Klomegah, R. Y. (2007). Predictors of academic performance of university students: An application of the goal efficacy model. *College Student Journal*, *41*(2), 407-415.
- Kmenta, J. (1986). *Elements of Econometrics*. New York: Macmillan Publishing Co.
- Knapp, J. R., & Karabenick, S. A. (1988). Incidence of formal and informal academic help-seeking in higher education. *Journal of College Student Development*, *29*(3), 223-227.
- Knapp, L. G., Kelly-Reid, J. E., Whitmore, R. W., & Miller, E. (2007). *Enrollment in postsecondary institutions, fall 2005; graduation rates, 1999 and 2002 cohorts; and financial statistics, fiscal year 2005*. Washington, DC: National Centre for Education Statistics, U.S. Department of Education. Retrieved February 15, 2012, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007154>
- Knight, J. (2002). *Trade in Higher Education Services: The implications of GATS*. United Kingdom: Report to the Observatory on Borderless Higher Education.
- Koch, S. E., & Foxcroft, C. D. (2003). A developmental focus to admission testing: admissions and placement standards development. *South African Journal of Higher Education*, *17*(3), 192-208. Retrieved from Sabinet database.
- Komiya, N., Good, G. E., & Sherrod, N. B. (2000). Emotional openness as a predictor of college students' attitudes toward seeking psychological help. *Journal of Counseling Psychology*, *47*(1), 138-143. doi:10.1037/0022-0167.47.1.138
- Kotze, M., & Griessel, L. (2008). The prediction of the academic performance of MBA students by means of specific aptitudes and competencies. *Journal for New Generations Sciences*, *6*(2), 60-79. Retrieved from Sabinet database.

- Koydemir-Özden, S. (2010). Self-aspects, perceived social support, gender, and willingness to seek psychological help. *International Journal of Mental Health, 39*(3), 44–60.
doi:10.2753/IMH0020-7411390303
- Krotseng, M. V. (1992). Predicting persistence from the Student Adaption to College Questionnaire: Early Warning or Siren Song? *Research in Higher Education, 33*(1), 99-111. doi:10.1007/BF00991974
- Kruss, G. (2002). More, better, different? Understanding private higher education in South Africa. *Perspectives in Education, 20*(4), 15-28.
- Kuncel, N. R., Crede, M., Thomas, L. L. (2005). The Validity of Self-Reported Grade Point Averages, Class Ranks, and Test Scores: A Meta-Analysis and Review of the Literature. *Review of Educational Research, 75*(1), 63-82.
doi:10.3102/00346543075001063
- Kuncel, N. R., Hezlett, S. A., & Ones, D. S. (2001). A comprehensive meta-analysis of the predictive validity of the graduate record examinations: Implications for graduate student selection and performance. *Psychological Bulletin, 127*(1), 162–181.
doi:10.1037//0033-2909.127.1.162
- La Forge, M. C., & Cantrell, S. (2003). Explanatory style and academic performance among college students beginning a major course of study. *Psychological Reports, 92*(3), 861–865. doi:10.2466/pr0.2003.92.3.861
- Lafreniere, K. D., Ledgerwood, D. M., & Docherty, A. L. (1997). Influences of leaving home, perceived family support, and gender on the transition to university. *Guidance and Counseling, 12*(4), 14-18. Retrieved from EBSCOhost database.
- Lane, J., & Lane, A. M. (2001). Self-efficacy and academic performance. *Social Behavior and Personality, 29*(7), 687-694. doi: 10.2224/sbp.2001.29.7.687

- Lane, J., Lane, A. M., & Cockerton, T. (2003). Prediction of academic performance from self-efficacy and performance accomplishments among master's degree students. *Journal of Hospitality, Leisure, Sport and Tourism Education*, 2(1), 113-118.
- Lane, J., Lane, A. M., & Kyprianou, A. (2004). Self-Efficacy, Self-Esteem And Their Impact On Academic Performance. *Social Behavior and Personality*, 32(3), 247-256. doi: 10.2224/sbp.2004.32.3.247
- Le, H., Casillas, A., Robbins, S. B., & Langley, R. (2005). Motivational and skills, social, and self-management predictors of college outcomes: Constructing the student readiness inventory. *Educational and Psychological Measurement*, 65(3), 482-508. doi: 10.1177/0013164404272493
- Lecompte, D., Kaufman, L., & Rousseeuw, P. (1983). Search for the relationship between interrupted university attendance of first year students and some psychosocial factors. *Acta Psychiatrica Belgica*, 83, 609-617. Retrieved from MEDLINE database.
- Lei, P. (2006). Structural Equation Modeling. In N. J. Salkind (Ed.), *Encyclopedia of Measurement and Statistics*. Retrieved June 14, 2011, from http://0-www.sage-reference.com.oasis.unisa.ac.za/Statistics/Article_n442.html.
- Lent, R. W., Brown, S. D., & Larking, K. C. (1984). Relation of self-efficacy expectations to academic achievement and persistence. *Journal of Counseling Psychology*, 31(3), 356-362. Retrieved from ERIC database.
- Lent, R. W., Brown, S. D., & Larking, K. C. (1987). Comparison of three theoretically derived variables in prediction career and academic behavior: Self-efficacy, interest congruence and consequence thinking. *Journal of Counseling Psychology*, 34(3), 293-298. doi: 10.1037/0022-0167.34.3.293
- Lent, R. W., Taveira, M., Sheu, H., & Singley, D. (2009). Social cognitive predictors of academic adjustment and life satisfaction in Portuguese college students: A

- longitudinal analysis. *Journal of Vocational Behavior*, 74(2), 190-198. doi:
10.1016/j.jvb.2008.12.006
- Lent, R. W., Lopez, F. G., & Bieschke, K. J. (1993). Predicting mathematics-related choice and success behaviors: Test of an expanded social cognitive model. *Journal of Vocational Behavior*, 42(2), 223-236. doi: 10.1006/jvbe.1993.1016
- Leong, F. T. L., Bonz, M. H., & Zachar, P. (1997). Coping styles as predictors of college adjustment among freshmen. *Counselling Psychology Quarterly*, 10(2), 211-220. doi:
10.1080/09515079708254173
- Letseka, M. (2001). Information and Communication technology Initiatives at the University of Fort Hare: Cure or Plague? *Knowledge, Technology, & Policy*, 14(1), 67-78. doi:
10.1007/s12130-001-1004-7
- Letseka, M., Breier, M., & Visser, M. (2009). Poverty, race and student achievement in seven higher education institutions. In M. Letseka, M. Cosser, M. Breier, & M. Visser (Eds.), *Student Retention and Graduate Destination: Higher Education and Labour Market Access and Success* (pp. 25-40). HSRC Press.
- Levitz, R., & Noel, L. (1989). Connecting students to institutions: Keys to retention and success. In M. L. Upcraft & J. N. Gardner (Eds.), *The freshman year experience: Helping students survive and succeed in college* (pp.65-81). San Francisco: Jossey Bass.
- Lidy, K. M., & Kahn, J. H. (2006). Personality as a predictor of first-semester adjustment to college: The mediational role of perceived social support. *Journal of College Counseling*, 9(2), 123-134. doi: 10.1002/j.2161-1882.2006.tb00099.x
- Lingen, J. M., Douman, D. L., & Wannenburg, I. (2011). A cross-sectional exploration of the relationship between undergraduate nursing student wellness and academic outcomes

- at a South African higher education institution. *South African Journal of Psychology*, 41(3), 396-408.
- Linn, B. S., & Zeppa, R. (1984). Stress in junior medical students: Relationships to personality and performance. *Journal of Medical Education*, 59(1), 7-12. Retrieved from MEDLINE database.
- Linver, M. R., Davis-Kean, P. E., & Eccles, G. S. (2002). *Influences of Gender on Academic Achievement*. Paper presented at the biennial meetings of the Society for Research on Adolescence, New Orleans, LA.
- Lockett, C. T., & Harrell, J. P. (2003). Racial identity, self-esteem, and academic achievement: Too much interpretation, too little supporting data. *Journal of Black Psychology*, 29(3), 325-336. doi: 10.1177/0095798403254216
- Lopez, F. G. (1989). Current family dynamics, trait anxiety, and academic adjustment: Test of a family-based model of vocational identity. *Journal of Vocational Behavior*, 35(1), 76-87. doi: 10.1016/0001-8791(89)90049-3
- Lotkowski, V. A., Robbins, S. B., & Noeth, R. J. (2004). The Role of Academic and Non-Academic Factors in Improving College Retention. ACT Policy Report. Retrieved April, 10, 2012, from <http://www.act.org/research/policymakers/reports/index.html>.
- Lounsbury, J. W., Gibson, L. W., & Saudargas, R. A. (2006). Scale Development. In F. T. L. Leong & J. T. Austin (Eds.), *The Psychology Research Handbook*. Retrieved June 14, 2011, from http://0-www.sage-reference.com.oasis.unisa.ac.za/hdbk_psychrsch/Article_n9.html.
- Lourens, A., & Smit, I. P. J. (2003). Retention: Predicting first-year success. *South African Journal of Higher Education*, 17(2), 169-176.

- Luckerson, V. (2013). *The Myth of the Four-Year College Degree*. Retrieved February 21, 2013, from <http://business.time.com/2013/01/10/the-myth-of-the-4-year-college-degree/>
- Luzzo, D. A. (1995). The relative contributions of self-efficacy and locus of control to the prediction of career maturity. *Journal of College Student Development, 36*(1), 61-66. Retrieved from ERIC database.
- Lyons, J. S., Perrotta, P., & Hancher-Kvam, S. (1988). Perceived social support from family and friends: Measurement across disparate samples. *Journal of Personality Assessment, 52*(1), 42-47. doi: 10.1207/s15327752jpa5201_3
- Lyubomirsky, S., Tkach, C., & DiMatteo, M. R. (2006). What are the differences between happiness and self-esteem? *Social Indicators Research, 78*(3), 363–404. doi: 10.1007/s11205-005-0213-y
- Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology, 82*(4), 760-768. Retrieved from ERIC database.
- MacCullum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology, 51*, 201-226. Retrieved from MEDLINE database.
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130-149. Retrieved March 6, 2013, from <http://www.statpower.net/Content/312/Handout/MacCallumBrowneSugawara96.pdf>
- Macfarlane, D. (2006). Shock varsity dropout stats. *Mail & Guardian*, September 22-28.

- MacGregor, K. (2012). *Plan for 1.5 million students by 2030*. University World News. Retrieved May 15, 2013, from <http://www.universityworldnews.com/article.php?story=20120115093819516>
- Madonna, C., & Ponterotto, J. (2006). Evaluating and Selecting Psychological Measures for Research Purposes. In F. T. L. Leong & J. T. Austin (Eds.), *The Psychology Research Handbook*. Retrieved June 14, 2011, from http://0-www.sage-reference.com.oasis.unisa.ac.za/hdbk_psychrsch/Article_n7.html.
- Mahoney, J. L., & Cairns, R. B. (1997). Do extracurricular activities protect against early school dropout? *Developmental Psychology*, *33*(2), 241–253. doi: 10.1037/0012-1649.33.2.241
- Mahoney, J. L., & Stattin, H. (2000). Leisure activities and adolescent antisocial behavior: The role of structure and context. *Journal of Adolescence*, *23*(2), 113–127. doi: 10.1006/jado.2000.0302
- Mahoney, J. L., Cairns, R. B., & Farmer, T. W. (2003). Promoting interpersonal competence and educational success through extracurricular activity participation. *Journal of Educational Psychology*, *95*(2), 409–418. doi: 10.1037/0022-0663.95.2.409
- Malefo, V. (2000). Psycho-social factors and academic performance among African woman students at a predominantly white university in South Africa. *South African Journal of Psychology*, *30*(4), 40-45.
- Mallinckrodt, B. (1988). Student retention, social support, and dropout intention: Comparison of black and white students. *Journal of College Student Development* *29*(1): 60–64.
- Mandew, M. (2003). *A guide to student services in South Africa*. Pretoria, South Africa: Centre for Higher Education Transformation.

- Mapesela, M. (2002). Is the proliferation of private higher colleges spelling doom for South African public higher education? *South African Journal of Higher Education*, 16(2), 56-62.
- Marsh, H. W., & Yeung, S. (1997). Causal effects of academic self-concept on academic achievement: Structural equation models of longitudinal data. *Journal of Educational Psychology*, 89(1), 41–54. doi: 10.1037/0022-0663.89.1.41
- Marsh, H. W., Trautwein, U., Lüdtke, O., Köller, O., & Baumert, J. (2005). Academic self-concept, interest, grades, and standardized test scores: Reciprocal effects models of causal ordering. *Child Development*, 76(2), 397–416. doi: 10.1111/j.1467-8624.2005.00853.x
- Martin, W. E., Jr., Swartz-Kulstad, J. L., & Madson, M. (1999). Psychosocial factors that predict the college adjustment of first-year undergraduate students: Implications for college counselors. *Journal of College Counseling*, 2(2), 121-133. doi: 10.1002/j.2161-1882.1999.tb00150.x
- Martinez, M. (2003). High attrition rates in e-Learning: Challenges, predictors, and solutions. *The e-Learning Developers Journal*. Retrieved November 15, 2011 from: <http://www.elearningguild.com/pdf/2/071403MGT-L.pdf>
- Masuda, A., Suzumura, K., Beauchamp, K. L., Howells, G. N., & Clay, C. (2005). United States and Japanese college students' attitudes toward seeking professional psychological help. *International Journal of Psychology*, 40(5), 303-313. doi: 10.1080/00207590444000339
- Mathis, M., & Lecci, L. (1999). Hardiness and college adjustment: Identifying students in need of services. *Journal of College Student Development*, 40(3), 305-309.
- Mbabela, Z., & de Jager, S. (January 4, 2013). PE's matric pass rate improves slightly. The Herald E-Edition.

- McCarthy, J. M., & Goffin, R. D. (2005). Selection test anxiety: Exploring tension and fear of failure across the sexes in simulated selection scenarios. *International Journal of Selection and Assessment*, *13*(4), 282-295. doi: 10.1111/j.1468-2389.2005.00325.x
- McDonald, A. S. (2001). The prevalence and effects of test anxiety in school children. *Educational Psychology*, *21*(1), 89–99. doi: 10.1080/01443410020019867
- McGivney, V. (2001). *Fixing or Changing the Pattern? Reflections on Widening Adult Participation in Learning*. Leicester: National Institute of Adult and Continuing Education.
- McGrath, R. E., Mitchell, M., Kim, B. H., & Hough, L. (2010). Evidence for response bias as a source of error variance in applied assessment. *Psychological Bulletin*, *136*(3), 450-470. doi: 10.1037/a0019216
- McInnis, C., James, R., & Hartley, R. (2000). *Trends in the first-year experience in Australian universities*. Department of Education, Training and Youth Affairs, Canberra. Retrieved January 10, 2012, from http://www.dest.gov.au/archive/highered/eippubs/eip00_6/fye.pdf.
- McKenzie, K., & Gow, K. (2004). Exploring the first year academic achievement of school leavers and mature-age students through structural equation modelling. *Learning and Individual Differences* *14*(2), 107-123. doi: 10.1016/j.lindif.2003.10.002
- McKenzie, K., & Schweitzer, R. (2001). Who succeeds at university? Factors predicting academic performance in first year Australian university students. *Higher Education Research and Development*, *20*(1), 21-33. doi: 10.1080/07924360120043621
- Michie, F., Glachan, M., & Bray, D. (2001). An evaluation of factors influencing the academic self-concept, self-esteem and academic stress for direct and re-entry students in higher education. *Educational Psychology*, *21*(4), 455-472. doi: 10.1080/01443410120090830

- Miller, R., Bradburry, J., & Acutt, K. (2001). Academic performance of English first and second-language students: A retrospective appraisal. *South African Journal of Higher Education, 15*(1), 147-153.
- Miller, R., Bradburry, J., & Pedley, K. (1998). Academic performance of first and second language students: Disadvantage and under preparedness. *South African Journal of Science, 94*(3), 103-107.
- Ministry of Education. (2001). *National Plan for Higher Education*. Pretoria: Ministry of Education.
- Miquelon, P., Vallerand, R. J., Grouzet, F. M. E., & Cardinal, G. (2005). Perfectionism, academic motivation, and psychological adjustment: An integrative model. *Personality and Social Psychology Bulletin, 31*(7), 913-924. doi: 10.1177/0146167204272298
- Misra, R., McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health, 16*(1), 41-51. Retrieved from <http://www.biomedsearch.com/article/College-students-academic-stress-its/65640245.html>
- Misra, R., McKean, M., West, S., & Russo, T. (2000). Academic stress of college students: comparison of student and faculty perceptions. *College Student Journal, 34*(2), 236-246. Retrieved from <http://www.freepatentsonline.com/article/College-Student-Journal/131318270.html>
- Miyasaka, J. R. (2000, April). *A framework for evaluating the validity of test preparation practices*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.
- Moleke, P. (2005). *Inequalities in Higher Education and the structure of the Labour Market*. Cape Town: HSRC Press.

- Mooney, S. P., Sherman, M. F., & Lo Presto, C. T. (1991). Academic locus of control, self-esteem, and perceived distance from home as predictors of college adjustment. *Journal of Counseling and Development, 69*(5), 445–448. Doi: 10.1002/j.1556-6676.1991.tb01542.x
- Morgan, T., Ness, D., & Robinson, M. (2003). Students' help-seeking behaviours by gender, racial background, and student status. *Canadian Journal of Counseling, 37*(2), 151-166. Retrieved from <http://cjc-rcc.ucalgary.ca/cjc/index.php/rcc/article/view/231>
- Morrison, J., Merrick, B., Higgs, S., & Le Métais, J. (2005). Researching the performance of international students in the UK. *Studies in Higher Education, 30*(3), 327 - 337. doi: 10.1080/03075070500095762
- Morstein, B., & Smart, J. (1977). A motivational typology of adult learners. *Journal of Higher Education, 48*(6), 665-679. Retrieved from <http://www.jstor.org/stable/1979011>
- Mtshali, N. (2013). *Only 15% of SA university students graduate*. Retrieved December 3, 2013, from <http://www.iol.co.za/lifestyle/family/kids/only-15-of-sa-university-students-graduate-1.1531809>
- Mueller, J. H., Jacobsen, D. M., & Schwarzer, R. (2000). What Are Computing Experiences Good For: A Case Study in Online Research. In M. Birnbaum (Ed.), *Psychological Experiments on the Internet* (pp. 195-216). San Diego: Academic Press.
- Muller, F. H., & Louw, J. (2004). Learning environment, motivation and interest: Perspectives on self-determination theory. *South African Journal of Psychology, 34*(2), 169-190.
- Müller, H., Swanepoel, E., & De Beer, A. (2010). Success profiling: A methodological perspective on the interactive nature of success predictors on student performance at an open and distance learning institution. *Perspectives in Education, 28*(2), 63-74.

- Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology, 38*(1), 30-38. doi: 10.1037/0022-0167.38.1.30
- Murthaugh, P. A., Burns, L. D., & Schuster, J. (1999). Predicting the retention of university students. *Research in Higher Education, 40*(3), 355-371. doi: 10.1023/A:1018755201899
- Mwamwenda, T. S. (1994). Gender differences in scores on test anxiety and academic achievement among South African University graduate students. *South African Journal of Psychology, 24*(4), 228-230.
- Nadler, A., & Fisher, J. D. (1986). The role of threat to self-esteem and perceived control in recipient reaction to help: Theory development and empirical validation. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 81-122). San Diego: Academic Press.
- Naidoo, S. (2008, February 24). *High drop-out rate due to poverty*. The Times, pp. 16.
- Nair, P. A. P., Reddy, L., & Ramaila, S. (2005, November). *Making sense of the high failure and dropout rates at South African Higher Education Institutions*. Paper presented at the Third Conference on Complexity Science and Educational Research. Retrieved February 15, 2012, from <http://www.complexityandeducation.ualberta.ca/conferences/2005/Documents/CSER322REDDY.ppt>.
- Napoli, A. R., & Wortman, P. M. (1998). Psychosocial factors related to retention and early departure of two-year community college students. *Research in Higher Education, 39*(4), 419- 455. Retrieved from <http://www.jstor.org/stable/40196330>

- National Centre for Education Statistics. (2003). *The condition of education 2003*. Washington, DC: U.S. Government Printing Office. Retrieved January 16, 2012, from <http://nces.ed.gov/pubs2003/2003067.pdf>.
- Naude, L., Jansen, V., Greyling, W., & Esterhuysen, K. (2011). Die rol van taalvaardigheid in die verband tussen matriek- en universiteitsprestasie van swart eerstejaarstudente. *Journal for Language Teaching*, 45(1), 116-130.
- Naveh-Benjamin, M., McKeachie, W. J., & Lin, Y. (1987). Two types of test-anxious students: Support for an information processing model. *Journal of Educational Psychology*, 79(2), 131-136.
- Neville, H. A., Heppner, P. P., Ji, P., & Thye, R. (2004). The relations among general and race-related stressors and psychoeducational adjustment in black students attending predominantly white institutions. *Journal of Black Studies*, 34(4), 599-618. doi: 10.1177/0021934703259168
- Newman, R. S. (2002) What do I need to do to succeed...when I don't understand what I'm doing!?: Developmental influences on students' adaptive help seeking. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 285-306). San Diego: Academic Press. doi: 10.1016/B978-012750053-9/50013-9
- Newman, R. S., & Goldin, L. (1990). Children's reluctance to seek help with schoolwork. *Journal of Educational Psychology*, 82(1), 92-100. doi: 10.1037/0022-0663.82.1.92
- Newman, R. S., & Schwager, M. T. (1993). Students' perceptions of the teacher and classmates in relation to reported help seeking in math class. *The Elementary School Journal*, 94(1), 3-17. Retrieved from <http://www.jstor.org/stable/1001871>
- Ngidi, D. P. (2007). Students' and lecturers' perceptions of some factors influencing students' academic success or failure at a historically black university in South Africa. *South African Journal of Higher Education*, 21(4), 717-732.

- Nicpon, M. F., Huser, L., Blanks, E. H., Sollenberger, S., Befort, C., & Robinson Kurpius, S. E. (2006–2007). The relationship of loneliness and social support with college freshmen's academic performance and persistence. *Journal of College Student Retention: Research, Theory and Practice*, 8(3), 345–358. doi: 10.2190/A465-356M-7652-783R
- Noel, L., Levitz, R., & Saluri, D. (1985). *Increasing student retention: Effective programs and practices for reducing the dropout rate*. San Francisco: Jossey Bass.
- Norton, S. M., & Park, H. S. (1996). *Relationships between test preparation and academic performance on a statewide high school exit examination*. Paper presented at the annual meeting of the Mid-South Educational Research Association, Tuscaloosa, AL. Retrieved from ERIC database.
- Ntshoe, I. M. (2002). National plan for higher education in South Africa: a programme for equity and redress or globalized competition and managerialism? *South African Journal of Higher Education*, 16(2), 7-10.
- Nunn, G. D. (1994). Adult learners' locus of control, self-evaluation and learning temperament as a function of age and gender. *Journal of Instructional Psychology*, 21(3), 260-264.
- Nunns, C., & Ortlepp, K. (1994). Exploring predictors of academic success in Psychology I at Wits University as an important component of fair student selection. *South African Journal of Psychology*, 24(4), 201-207. doi: 10.1177/008124639402400405
- Ojeda, L., Flores, L. Y., & Navarro, R. L. (2011). Social cognitive predictors of Mexican American college students' academic and life satisfaction. *Journal of Counseling Psychology*, 58(1), 61-71. doi: 10.1037/a0021687
- Okun, M. A., Sandler, I. N., & Baumann, D. J. (1988). Buffer and booster effects as event-support transactions. *American Journal of Community Psychology*, 16(3), 435- 449.

- doi: 10.1007/BF00919381 Oliver, J. M., Reed, C. K. S., Katz, B. M., & Haugh, J. A. (1999). Students' self-reports of help-seeking: The impact of psychological problems, stress, and demographic variables on utilization of formal and informal support. *Social Behavior and Personality*, 27(2), 109-128. doi: 10.2224/sbp.1999.27.2.109
- Olobatuyi, M. E. (2006). *A user's guide to path analysis*. Lanham, Maryland: University Press of America.
- Omura, K. (2007). Situation-related changes of causal structures and the stress model in Japanese college students. *Social Behavior and Personality*, 35(7), 943-960. doi: 10.2224/sbp.2007.35.7.943
- Orozco, C. D. (1999). Factors contributing to the psychosocial adjustment of Mexican-American college students. *Dissertation Abstracts International – A*, 56 (5). Retrieved December 11, 2011, from PsycINFO database.
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, 66(4), 543-578. doi: 10.3102/00346543066004543
- Pajares, F., Cheong, Y. F., & Oberman, P. (2004). Psychometric Analysis of Computer Science Help-Seeking Scales. *Educational and Psychological Measurement*, 64(3), 496-513. doi: 10.1177/0013164403258447
- Pajares, F., & Miller, M. D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: A path analysis. *Journal of Educational Psychology*, 86(2), 193–203.
- Pancer, S. M., Hunsberger, B., Pratt, M. W., & Alisat, S. (2000). Cognitive complexity of expectations and adjustment to university in the first year. *Journal of Adolescent Research*, 15(1), 38-57. doi: 10.1177/0743558400151003

- Pandor, N. (2005). *Human Resources for Knowledge Management in South Africa*. Speech to Human Resources for Knowledge Management in South Africa Conference, June 23, 2005, Cape Town.
- Paras, J. (2001). Crisis in mathematics education. Trainee failure: Challenges and possibilities. *South African Journal of Higher Education*, 15(3), 66-73.
- Parker, J. D. A., Summerfeldt, L. J., Hogan, M. J., & Majeski, S. A. (2004). Emotional intelligence and academic success: examining the transition from high school to university. *Personality and Individual Differences*, 36(1), 163-173. doi: 10.1016/S0191-8869(03)00076-X
- Pascarella, E. T., & Terenzini, P. T. (2005). *How College Affects Students: A Third Decade of Research (Vol. 2)*. San Francisco, CA: Jossey-Bass.
- Pascarella, E., & Chapman, D. (1983). A multiinstitutional, path analytic validation of Tinto's model of college withdrawal. *American Educational Research Journal*, 20(1), 87-102. Retrieved from <http://www.jstor.org/stable/1162676>.
- Pascarella, E., & Terenzini, P. (1980). Predicting freshman persistence and voluntary drop-out decisions from a theoretical model. *Journal of Higher Education*, 51(1), 60-75. Retrieved from <http://www.jstor.org/stable/1981125>.
- Pascarella, E. T., & Terenzini, P. T. (1983). Predicting voluntary freshman year persistence/withdrawal behaviour in a residential university: A path analytic validation of Tinto's model. *Journal of Educational Psychology*, 75(2), 215-226. doi: 10.1037/0022-0663.75.2.215
- Pascarella, E. T., & Terenzini, P. T. (1991). *How College Affects Students*. San Francisco, CA: Jossey-Bass.

- Paton, G. (2008). *One in seven students drops out of university*. UK Telegraph. Retrieved November 18, 2011, from <http://www.telegraph.co.uk/news/uknews/2075348/One-in-seven-studentsdrops-out-of-university.html>
- Pedhazur, E. J., & Schmelkin, L. P. (1991). *Measurement, design, and analysis: An integrated approach*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Perry, R. P. (2003). Perceived (academic) control and causal thinking in achievement settings. *Canadian Psychology, 44*(4), 312–331.
- Petersen, I., Louw, J., & Dumont, K. (2009). Adjustment to university and academic performance among disadvantaged students in South Africa. *Journal of Educational Psychology, 29*(1), 99-115. doi: 10.1080/01443410802521066
- Petersen, I., Louw, J., Dumont, K., & Malope, N. (2010). Adjustment to university and academic performance: Brief report of a follow-up study. *Journal of Educational Psychology, 30*(4), 369-375. doi: 10.1080/01443411003659978
- Petersen, I. (2006). *Psychosocial factors and academic performance among first-year financial aid students: testing adjustment as a mediator variable* (Unpublished masters dissertation). University of Cape Town, South Africa.
- Petty, G. (n.d.). *Paths Analysis*. Retrieved November 28, 2012, from <http://computerwranglers.com/Com531/Handouts/Path%20Analysis.doc>
- Phan, H. P. (2010). Students' academic performance and various cognitive processes of learning: an integrative framework and empirical analysis. *Educational Psychology, 30*(3), 297-322. doi: 10.1080/01443410903573297
- Philander, S. G. (2008). *How Many Scientists Does A Country Need?* Retrieved May 15, 2013, from <http://www.access.ac.za/outputs/publications/how-many-scientists-does-south-africa-need>

- Pintrich, P. R. (1989). The dynamic interplay of student motivation and cognition in the college classroom. In C. Ames & M. Maehr (Eds.), *Advances in motivation and achievement: Motivation-enhancing environments* (pp. 117-160). Greenwich, CT: JAI.
- Pintrich, P. R. (2000). An achievement goal perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology*, 25(1), 92-104. doi: 10.1006/ceps.1999.1017
- Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Ann Arbor, Michigan. Retrieved from ERIC database.
- Pintrich, P. R., Smith, D.A.F., Garcia, T., & McKeachie, W. J. (1993). Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). *Educational and Psychological Measurement*, 53(3), 801-813. doi: 10.1177/0013164493053003024
- Pintrich, P. R., & De Groot, E.V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33-40. Retrieved from <http://www.stanford.edu/dept/SUSE/projects/ireport/articles/self-regulation/self-regulated%20learning-motivation.pdf>
- Pokay, P., & Blumenfeld, P. (1990). Predicting achievement early and late in the semester: The role of motivation and use of learning strategies. *Journal of Educational Psychology*, 82(1), 41-50.
- Polasek, O., & Kolcic, I. (2006). Academic performance and scientific involvement of final year medical students coming from urban and rural backgrounds. *Rural and Remote Health*, 6(2), 1-7.

- Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, *135*(2), 322-338. doi: 10.1037/a0014996
- Potter, C., & van der Merwe, E. (1994). Academic performance in Engineering. *South African Journal of Higher Education*, *8*(1), 193-215.
- Prat-Sala, M., & Redford, P. (2012). Writing essays: Does self-efficacy matter? The relationship between self-efficacy in reading and in writing and undergraduate students' performance in essay writing. *Educational Psychology*, *32*(1), 9-20. doi: 10.1080/01443410.2011.621411
- Pratt, M. W., Hunsberger, B., Pancer, S. M., Alisat, S., Bowers, C, Mackey, K., Ostaniewicz, A., Rog, E., Terzian, B., & Thomas, N. (2000). Facilitating the transition to university: Evaluation of a social support discussion intervention program. *Journal of College Student Development*, *41*(4), 427-441.
- Pretorius, E. J. (2002). Reading ability and academic performance in South Africa: Are we fiddling while Rome is burning? *Language Matters: Studies in the Languages of Africa*, *33*(1), 169-196. doi: 10.1080/10228190208566183
- Pritchard, M. E., & Wilson, G. S. (2003). Using emotional and social factors to predict student success. *Journal of College Student Development* *44*(1), 18–28. doi: 10.1353/csd.2003.0008
- Procidano, M. E., & Heller, K. (1983). Measures of perceived social support from friends and from family: Three validation studies. *American Journal of Community Psychology*, *11*(1), 1-24. doi: 10.1007/BF00898416
- Prus, J., Hatcher, L., Hope, M., & Grabiell, C. (1995). The learning and study strategies inventory (LASSI) as a predictor of first-year college academic success. *Journal of the Freshman Year Experience*, *7*, 7–26.

- Putwain, D. (2007). Researching academic stress and anxiety in students: some methodological considerations. *British Educational Research Journal*, 33(2), 207-219. doi: 10.1080/01411920701208258
- Ramos-Sanchez, L., & Nichols, L. (2007). Self-efficacy of first-generation and non-first-generation college students: The relationship with academic performance and college adjustment. *Journal of College Counseling*, 10(1), 6-18. doi: 10.1002/j.2161-1882.2007.tb00002.x
- Ramsay, S., Barker, M., & Jones, E. (1999). Academic Adjustment and Learning Process: a Comparison of International and Local Students in First-Year University. *Higher Education Research and Development*, 18(1), 129-144. doi: 10.1080/0729436990180110
- Ramsay, S., Jones, E., Barker, M. (2007). Relationship between adjustment and support types: Young and mature-aged local and international first year university students. *Higher Education*, 54(2), 247-265. doi: 10.1007/s10734-006-9001-0
- Rana, R. A., & Mahmood, N. (2010). The relationship between test anxiety and academic achievement. *Bulletin of Education and Research*, 32(2), 63-74. Retrieved from <http://pu.edu.pk/images/journal/ier/PDF-FILES/4-Rizwan%20Akram%20Rana.pdf>
- Rasor, L. T., & Rasor, R. A. (1998). Test anxiety and study behavior of community college students in relation to ethnicity, gender, and age. Retrieved from ERIC database (ED415942).
- Raunic, A., & Xenos, S. (2008). University Counselling Services Utilisation by Local and International Students and User Characteristics: A Review. *International Journal for the Advancement of Counselling*, 30(4), 262-267. doi: 10.1007/s10447-008-9062-0
- Reisberg, L. (2000). Student stress is rising, especially among women. *The Chronicle of Higher Education*, 46(21), 49-50.

- Reisberg, R., Bailey, M., Burger, C., Hamann, J., Raelin, J., & Whitman, D. (2010). The effect of gender on support and self-efficacy in undergraduate engineering programs. *American Society for Engineering Education*. Retrieved from www.coe.neu.edu/pathways/EffectofGender.pdf
- Reitzes, D. C., & Mutran, E. (1980). Significant others and self conceptions: Factors influencing educational expectations and academic performance. *Sociology of Education*, 53(1), 21-32. Retrieved from <http://www.jstor.org/stable/2112576>
- Reynolds, A. L., & Weigand, M. J. (2010). The Relationship Among Academic Attitudes, Psychological Attitudes, and the First-Semester Academic Achievement of First-Year College Students. *Journal of Student Affairs Research and Practice*, 47(2), 173-193. doi: 10.2202/1949-6605.6004
- Rezazadeh, M., & Tavakoli, M. (2009). Investigating the relationship among test anxiety, gender, academic achievement and years of study: A case of Iranian EFL university students. *English Language Teaching*, 2(4), 68-74. Retrieved from <http://www.ccsenet.org/journal/index.php/elt/article/view/4449/3789>
- Rhodes in drive to increase doctorates. (2013, March 28). *The Herald*, p. 7.
- Richardson, J. T. E. (1995). Mature students in higher education: An investigation of approaches to studying and academic performance. *Studies in Higher Education*, 20(1), 5-17. doi: 10.1080/03075079512331381760
- Richardson, J. T. E., & King, E. (1998). Adult students in higher education: Burden or boon? *Journal of Higher Education*, 69(1), 65-88. Retrieved from <http://www.jstor.org/stable/2649182>
- Richardson, M., Abraham, C., & Bond, R. (2012). Psychological Correlates of University Students' Academic Performance: A Systematic Review and Meta-Analysis. *Psychological Bulletin*, 138(2), 353-387. doi: 10.1037/a0026838

- Richmond, V. P., Wrench, J. S., & Gorhan, J. (2001). *Communication, affect, and learning in the classroom*. (2nd ed.). Acton, MA: Tapestry Press.
- Robbins, S. B., Allen, J., Casillas, A., Peterson, C., & Le, H. (2006). Unraveling the differential effects of motivational and skills, social, and self-management measures from traditional predictors of college outcomes. *Journal of Educational Psychology*, 98(3), 598-616. doi: 10.1037/0022-0663.98.3.598
- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, 130(2), 261–288. doi: 10.1037/0033-2909.130.2.261
- Robbins, S. B., Oh, I., Le, H., & Button, C. (2009). Intervention Effects on College Performance and Retention as Mediated by Motivational, Emotional, and Social Control Factors: Integrated Meta-Analytic Path Analyses. *Journal of Applied Psychology*, 94(5), 1163-1184. doi: 10.1037/a0015738
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic Books.
- Rosenberg, M., Schooler, C., Schoenbach, C., & Rosenberg, F. (1995). Global self-esteem and specific self-esteem: Different concepts, different outcomes. *American Sociological Review*, 60(1), 141-156. Retrieved from <http://www.jstor.org/stable/2096350>
- Ross, D. B., & Driscoll, R. (2006). *Test anxiety: Age appropriate interventions*. Paper presented at the American Counseling Association Southern Region Leadership Conference, Huntsville, Alabama.
- Ross, J., & Hammer, N. (2002). College freshman: Adjustment and achievement in relation to parenting and identity style. *Journal of Undergraduate Research*, 5, 211- 217. Retrieved from <http://murphylibrary.uwlax.edu/digital/jur/2002/ross-hammer.pdf>

- Roxas, M. L., & Stoneback, J. Y. (2004). The importance of gender across cultures. *Journal of Business Ethics*, 50(2), 149-165. doi: 10.1023/B:BUSI.0000022127.51047.ef
- Rueger, S. Y., Malecki, C. K., Demaray, M. K. (2008). Gender Differences in the Relationship between Perceived Social Support and Student Adjustment during Early Adolescence. *School Psychology Quarterly*, 23(4), 496-514. doi: 10.1037/1045-3830.23.4.496
- Russell, J., Thomson, G., & Rosenthal, D. (2008). International student use of university health and counselling services. *Higher Education*, 56(1), 59-75. doi: 10.1007/s10734-007-9089-x
- Russell, R. K., & Petrie, T. A. (1992). Academic adjustment of college students: Assessment and counseling. In S. D. Brown & R. W. Lent (Eds.), *Handbook of counseling psychology* (2nd ed., pp. 485-511). New York: John Wiley & Sons INC.
- Ryan, A. M., & Pintrich, P. R. (1997). "Should I ask for help?" The role of motivation and attitudes in adolescents-help seeking in math class. *Journal of Educational Psychology*, 89(2), 329-341. doi: 10.1037/0022-0663.89.2.329
- Ryan, A. M., Hicks, L., & Midgley, C. (1997). Social goals, academic goals, and avoiding seeking help in the classroom. *Journal of Early Adolescence*, 17(2), 152-171. doi: 10.1177/0272431697017002003
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67. doi: 10.1006/ceps.1999.1020
- Sander, P. & Sanders, L. (2003). Measuring confidence in academic study: A summary report. *Electronic Journal of Research in Educational Psychology and Psychopedagogy*, 1(1), 1-17. Retrieved from <http://www.investigacion-psicopedagogica.org/revista/new/english/ContadorArticulo.php?1>

- Sanders, L., & Sander, P. (2007). Academic Behavioural Confidence: A comparison of medical and psychology students. *Electronic Journal of Research in Educational Psychology*, 5(3), 633-650. Retrieved from http://www.investigacion-psicopedagogica.org/revista/articulos/13/english/Art_13_150.pdf
- Sandler, M. E. (1999). *A structural model of student integration, finances, behaviour, and career development: An elaborated framework of attitudes and persistence*. Paper presented at the 24th annual meeting of the Association for the Study of Higher Education, San Antonio, Texas.
- Sandler, M. E. (2000). Career decision-making self-efficacy, perceived stress, and an integrated model of student persistence: A structural model of finances, attitudes, behavior, and career development. *Research in Higher Education*, 41(5), 537-580. doi: 10.1023/A:1007032525530
- Sandler, M. E. (2001). *Perceived stress and an elaborated structural model of adult student persistence: An examination of financial aid, financial satisfaction, intent to persist and persistence*. Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA.
- Sansgiry, S. S., & Sail, K. (2006). Effect of students' perception of course loads on test anxiety. *America Journal of Pharmaceutical Education*. 70(2), 1-6. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1636912/pdf/ajpe26.pdf>
- Santed. (2009). *South Africa-Norway Tertiary Education Development II Programme*. Annual Report, 1-61. East London, University of Fort Hare.
- Santiago, A. M., & Einarson, M. K. (1998). Background characteristics as predictors of academic self-confidence and academic self-efficacy among graduate science and engineering students. *Research in Higher Education*, 39(2), 163-198. doi: 10.1023/A:1018716731516

- Savalei, V., & Bentler, P. (2006). Structural Equation Modeling. In R. Grover & M. Vriens (Eds.), *The Handbook of Marketing Research*. Retrieved June 14, 2011, from http://0-www.sage-ereference.com.oasis.unisa.ac.za/hdbk_mktgresearch/Article_n17.html.
- Schneider, M. E., & Ward, D. J. (2003). The role of ethnic identification and perceived social support in Latinos' adjustment to college. *Hispanic Journal of Behavioral Sciences*, 25(4), 539–554. doi: 10.1177/0739986303259306
- Schnuck, J., & Handal, P. J. (2011). Adjustment of College freshman as predicted by both perceived parenting style and the five factor model of personality. *Psychology*, 2(4), 275-282. doi: 10.4236/psych.2011.24044
- Schreiber, B. (1998). *An exploration of the effects of the student mentoring programme at the University of the Western Cape on a group of first year students* (Unpublished master's thesis). University of the Western Cape, Bellville, South Africa.
- Schunk, D. (1991). Self efficacy and academic motivation. *Educational Psychologist*, 26(3 & 4), 207-231. Retrieved from <http://www.people.vcu.edu/~rmreardon/data%20files/MERC/skillsmismatch/schunk%20academic%20self%20efficacy.pdf>
- Schwitzer, A. M., Robbins, S. B., & McGovern, T. V. (1993). Influences of goal instability and social support on college adjustment. *Journal of College Student Development*, 34(1), 21-25.
- Sclove, S. L. (2006). Path Analysis. In N. J. Salkind (Ed.), *Encyclopedia of Measurement and Statistics*. Retrieved June 14, 2011, from http://0-www.sage-ereference.com.oasis.unisa.ac.za/Statistics/Article_n355.html.
- Scott, I., Yeld, N., & Hendry, J. (2007). A Case for Improving Teaching and Learning in South African Higher Education. *Higher Education Monitor*, 6, 1-98. Retrieved from http://www.che.ac.za/documents/d000155/HE_Monitor_6_ITLS_Oct2007.pdf

- Seifert, T. L., O'Keefe, B. A. (2001). The relationship of work avoidance and learning goals to perceived competence, externality and meaning. *British Journal of Educational Psychology, 71*(1), 81–92. doi: 10.1348/000709901158406
- Seipp, B. (1991). Anxiety and academic performance: a meta-analysis of findings. *Anxiety Research, 4*(1), 27-41. doi:10.1080/08917779108248762
- Seipp, B., & Schwarzer, C. (1996). Crosscultural anxiety research. A review. In C. Schwarzer & M. Zeidner (Eds.), *Stress, anxiety, and coping in academic settings* (pp. 13–68). Tübingen, Germany: Francke.
- Senecal, C., Koestner, R., & Vallerand, R. J. (1995). Self-regulation and academic procrastination. *Journal of Social Psychology, 135*(5), 607–619. doi: 10.1080/00224545.1995.9712234
- Sennett, J., Finchilescu, G., Gibson, K., & Strauss, R. (2003). Adjustment of black students at a historically white South African university. *Educational Psychology, 23*(1), 107-116. doi: 10.1080/01443410303219
- Sheehan, E. P., McMenamin, N., & McDevitt, T. M. (1992). Learning styles of traditional and nontraditional university students. *College Student Journal, 26*(4), 486–490.
- Shochet, I. M. (1994). The moderator effect of cognitive modifiability on a traditional undergraduate admissions test for disadvantaged black students in South Africa. *South African Journal of Psychology, 24*(4), 208-215. doi: 10.1177/008124639402400406
- Siegel, R. G., Galassi, J. P., & Ware, W. B. (1985). A comparison of two models for predicting mathematics performance: Social learning versus math aptitude-anxiety. *Journal of Counseling Psychology, 32*(4), 531-538. doi: 10.1037/0022-0167.32.4.531
- Sikhwari, T. D. (2007). The relationship between affective factors and the academic achievement of students at the University of Venda. *South African Journal of Higher Education, 21*(3), 520-536.

- Silverman, S., & Juhasz, A. (1993). A developmental interpretation of help rejection. *Journal of Developmental Education, 17*(2), 24-31.
- Sipos, K., Sipos, M., & Spielberger, C. D. (1986). First results with the Hungarian test anxiety inventory. In C. D. Spielberger & R. Diaz-Guerrero (Eds.), *Crosscultural Anxiety* (pp. 37-44). Washington: Hemisphere Publishing.
- Smith, J., & Naylor, R. (2001). Determinants of degree performance in UK universities: A statistical analysis of the 1993 student cohort. *Oxford Bulletin of Economics and Statistics, 63*(1), 29–60. doi: 10.1111/1468-0084.00208
- Smith, K. J., Davy, J. A., & Rosenberg, D. L. (2009). The influence of motivation on cheating behaviour among accounting majors. *Advances in Accounting Education: Teaching and Curriculum Innovations, 10*, 169-188. doi: 10.1108/S1085-4622(2009)0000010011
- Smith, K. L., Michael, W. B., & Hocevar, D. (1990). Performance on creativity measures with examination-taking instructions to induce high or low levels of test anxiety. *Creativity Research Journal, 3*(4), 265–280. doi: 10.1080/10400419009534360
- Smith, M. A., & Baker, R. W. (1987). Freshman decidedness regarding academic major and adjustment to college. *Psychological Reports, 61*(3), 847-853. doi: 10.2466/pr0.1987.61.3.847
- Smith, R. J., Arnkoff, D., & Wright, T. (1990). Test anxiety and academic competence: A comparison of alternative models. *Journal of Counseling Psychology, 37*(3), 313-321. doi: 10.1037/0022-0167.37.3.313
- Solberg, V. S., & Villareal, P. (1997). Examination of self-efficacy, social support, and stress as predictors of psychological and physical distress among Hispanic college students. *Hispanic Journal of Behavioral Sciences, 19*(2), 182-201. doi: 10.1177/07399863970192006

- Solberg, V. S., O'Brien, K. M., Villareal, P., Kennel, R., & Davis, B. (1993). Self-efficacy and Hispanic college students: Validation of the College Self-Efficacy Instrument. *Hispanic Journal of Behavioral Sciences, 15*(1), 80–95.
doi:10.1177/07399863930151004
- Sommer, M., & Dumont, K. (2011). Psychosocial factors predicting academic performance of students at a historically disadvantaged university. *South African Journal of Psychology, 41*(3), 386-395. doi: 10.1177/008124631104100312
- Spielberger, C. D. (1980). *Preliminary Professional Manual for the Test Anxiety Inventory*. Palo Alto, CA: Consulting Psychologist Press.
- Spitzer, T. M. (2000). Predictors of college success: A comparison of traditional and nontraditional age students. *Journal of Student Affairs Research and Practice, 38*(1), 99–115. doi: 10.2202/1949-6605.1130
- Steenkamp, L. P., Baard, R. S., & Frick, B. L. (2009). Factors influencing success in first-year accounting at a South African university: A comparison between lecturers' assumptions and students' perceptions. *South African Journal of Accounting Research, 23*(1), 113-140. Retrieved from http://www.sajar.co.za/documents/113to140_Vol23.pdf
- Stephen, D. F. (2003). *English language proficiency as a likely predictor of academic performance of human resources management students at Technikon Natal* (Unpublished doctoral dissertation). Rand Afrikaans University, Johannesburg, South Africa.
- Stephen, D. F., Welman, J. C., & Jordaan, W. J. (2004). English language proficiency as an indicator of academic performance at a tertiary institution. *South African Journal of Human Resource Management, 2*(3), 42-53.

- Strahan, E. Y. (2003). The effects of social anxiety and social skills on academic performance. *Personality and Individual Differences, 34*(2), 347-366. doi: 10.1016/S0191-8869(02)00049-1
- Streiner, D.L. (2005). Finding our way: An introduction to path analysis. *Canadian Journal of Psychiatry, 50*(2), 115-122. Retrieved from <http://www.unt.edu/rss/class/mike/6810/articles/pathintro.pdf>
- Struthers, W., Perry, R. P., & Menec, V. H. (2000). An Examination of the Relationship among Academic Stress, Coping, Motivation, and Performance in College. *Research in Higher Education, 41*(5), 581-592. doi: 10.1023/A:1007094931292
- Strydom, J. F., & Mentz, M. (2010). *South African Survey of Student Engagement: Focusing the Student Experience on Success through Student Engagement*. Pretoria: Council on Higher Education.
- Stupnisky, R. H., Renaud, R. D., Perry, R. P., Ruthig, J. C., Haynes, T. L., & Clifton, R. A. (2007). Comparing self-esteem and perceived control as predictors of first-year college students' academic achievement. *Social Psychology of Education, 10*(3), 303-330. doi: 10.1007/s11218-007-9020-4
- Suinn, R. M. (1968). The desensitization of test anxiety by group and individual treatment. *Behaviour Research and Therapy, 6*(3), 385-387. doi: 10.1016/0005-7967(68)90071-5
- Swanepoel, E., De Beer, A., & Müller, H. (2009). Using satellite classes to optimize access to and participation in first year Business Management: A case at an open and distance learning university in South Africa. *Perspectives in Education, 27*(3), 311-319.
- Swanson, S., & Howell, C. (1996). Test anxiety in adolescents with learning disabilities and behavior disorders. *Exceptional Children, 62*(5), 389-397. Retrieved from <http://www.freepatentsonline.com/article/Exceptional-Children/18139389.html>

- Sweet, R. (1986). Student dropout in distance education: An application of Tinto's model. *Distance Education, 7*(2), 201-213. doi: 10.1080/0158791860070204
- Tait, M., Van Eeden, S., & Tait, M. (2002). An exploratory study on the perceptions of previously educationally disadvantaged first-year learners of law regarding university education. *South African Journal of Higher Education, 16*(2), 177-182. Retrieved from Sabinet database.
- Talib, N., & Sansgiry, S. S. (2011). Factors affecting academic performance of university students in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business, 3*(3), 589-600. Retrieved from <http://ijcrb.webs.com/archives.htm>
- Tao, S., Dong, Q., Pratt, M. W., Hunsberger, B., & Pancer, S. M. (2000). Social support: Relations to coping and adjustment during the transition to university in the People's Republic of China. *Journal of Adolescent Research, 15*(1), 123-144. doi: 10.1177/0743558400151007
- Taylor, M. A., & Pastor, D. A. (2007). A confirmatory factor analysis of the Student Adaption to College Questionnaire. *Educational and Psychological Measurement, 67*(6), 1002-1018. doi: 10.1177/0013164406299125
- Taylor, S. (1999). *Health Psychology*. Fairfield, PA: McGraw- Hill.
- Teaching and Learning Centre. (2009). *Placement and Access Tests (PAT) Report & Proposal*. University of Fort Hare, East London.
- Teaching and Learning Centre. (2009). *Placement and Access Tests (PAT) 2009 intake FINAL Statistics*. University of Fort Hare, East London.
- Tedeschi, G. J., & Willis, F. N. (1993). Attitudes toward counseling among Asian international and native Caucasian students. *Journal of College Student Psychotherapy, 7*(4), 43-54. doi: 10.1300/J035v07n04_04

- Terenzini, P. T., Cabrera, A., & Bernal, E. (2001). *Swimming against the tide: The poor in American higher education* (College Board Research Report No. 2001-3). New York: College Entrance Examination Board. Retrieved from <http://research.collegeboard.org/sites/default/files/publications/2012/7/researchreport-2001-1-swimming-against-tide-the-poor-american-higher-education.pdf>
- Terenzini, P. T., & Pascarella, E. T. (1978). The relation of students' precollege characteristics and freshman year experience to voluntary attrition. *Research in Higher Education*, 9(4), 347-366. doi: 10.1007/BF00991406
- Terenzini, P. T., & Pascarella, E. T. (1980). Toward the validation of Tinto's model of college student attrition: A review of recent studies. *Research in Higher Education*, 12(3), 271-282. doi: 10.1007/BF00976097
- Terenzini, P. T., Rendon, L. I., Upcraft, M. L., Millar, S. B., Allison, K. W., Gregg, P. L., & Jalomo, R. (1994). The transition to college: Diverse students, diverse stories. *Research in Higher Education*, 35(1), 57-73. doi: 10.1007/BF02496662
- Thatcher, A., Fridjhon, P., & Cockcroft, K. (2007). The relationship between lecture attendance and academic performance in an undergraduate psychology class. *South African Journal of Psychology*, 37(3), 656-660. doi: 10.1177/008124630703700316
- Thatcher, A., Rosenstein, D., Grootenhuis, G. K., & Haiden, G. (2010). Critical reflections on collecting class attendance registers in large Psychology classes. *Acta Academica: Teaching of psychology in South Africa: Supplementum*, 2, 133-167. Retrieved from Sabinet database.
- The Guardian. (2009, June). *DATA: dropout rates for every university* [Fact sheet]. Retrieved November 21, 2011, from <http://spreadsheets.google.com/pub?key=rjOIMfz31BnVzx0HcijtiBg&single=true&gid=0&output=html>.

- Thomas, C. R., & Gadbois, S. A. (2007). Academic self-handicapping: The role of self-concept clarity and students learning strategies. *British Journal of Educational Psychology, 77*(1), 101-119. doi: 10.1348/000709905X79644
- Thomas, D., Love, K. M., Roan-Belle, C., Tyler, K. M., Brown, C. L., & Garriott, P. O. (2009). Motivation, self-efficacy, and academic adjustment among African American women attending institutions of higher education. *Journal of Negro Education, 78*(2), 159-171. Retrieved from <http://www.jstor.org/stable/25608732>
- Thomas, J. W., Bol., L., & Warkentin, R. W. (1991). Antecedents of college studies study deficiencies: The relationship between course features and student study activities. *Journal of Higher Education, 22*(3), 275-296. doi: 10.1007/BF00132292
- Tice, D. M., & Gailliot, M. (2006). How self-esteem relates to the ills and triumphs of society. In M. H. Kernis (Ed.), *Self-esteem issues and answers: A sourcebook of current perspectives* (pp. 412–419). New York: Psychology Press.
- Tieu, T. T., & Pancer, S. M. (2009). Cocurricular involvement and first year students' transition to university: Quality vs. quantity of involvement. *Journal of the First Year Experience and Students in Transition, 21*(1), 43–64. Retrieved from ERIC database.
- Tieu, T. T., Pancer, S. M., Pratt, M. W., Wintre, M. G., Birnie-Lefcovitch, S., Polivy, J., & Adams, G. (2010). Helping out or hanging out: The features of involvement and how it relates to university adjustment. *Higher Education, 60*(3), 343-355. doi: 10.1007/s10734-009-9303-0
- Ting, S. M. R., & Robinson, T.L. (1998). First-year academic success: A prediction combining cognitive and psychosocial variables for Caucasian and African American students. *Journal of College Student Development, 39*(6), 599-610. Retrieved from PsycINFO database.

- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89-125. doi: 10.3102/00346543045001089
- Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago, IL: University of Chicago Press.
- Tinto, V. (1996). Reconstructing the first year of college. *Planning for Higher Education*, 25(1), 1-6.
- Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. *The Journal of Higher Education*, 68(6), 599-623. Retrieved from <http://www.jstor.org/stable/2959965>
- Toews, M. L., & Yazedjian, A. (2007). College adjustment among freshman: Predictors for white and hispanic males and females. *College Student Journal*, 41(4), 891-900.
- Torres, J. B., & Solberg, V. S. (2001). Role of self-efficacy, stress, social integration, and family support in Latino college student persistence and health. *Journal of Vocational Behavior* 59(1), 53–63. doi: 10.1006/jvbe.2000.1785
- Tracey, T. J., & Sedlacek, W. E. (1984). Noncognitive variables in predicting academic success by race. *Measurement and Evaluation in Guidance*, 16(4), 171-178.
- Tracey, T. J., & Sedlacek, W. E. (1985). The relationship of noncognitive variables to academic success: A longitudinal comparison by race. *Journal of College Student Personnel*, 26(5), 405-410. Retrieved from PsycINFO database.
- Trapmann, S., Hell, B., Weigand, S., & Schuler, H. (2007). Die Validität von Schulnoten zur Vorhersage des Studienerfolgs – eine Metaanalyse [The validity of high-school grades for academic achievement – A meta-analysis]. *Zeitschrift für Pädagogische Psychologie*, 21(1), 11–27. doi: 10.1024/1010-0652.21.1.11

- Trzesniewski, K. H., Donnellan, M. B., & Robin, R. W. (2003). Stability of self-esteem across the life span. *Journal of Personality and Social Psychology*, *84*(1), 205–220. doi: 10.1037/0022-3514.84.1.205
- Türküm, A.S. (2004). Developing a scale of attitudes toward seeking psychological help: Validity and reliability analyses. *International Journal for the Advancement of Counselling*, *26*(3), 321–329. doi: 10.1023/B:ADCO.0000035534.04757.aa
- Türküm, A. S. (2005). Who seeks help? Examining the differences in attitudes of Turkish university students toward seeking psychological help by gender, gender roles, and help-seeking experiences. *The Journal of Men's Studies*, *13*(3), 389-401. doi: 10.3149/jms.1303.389
- Turner, E. A., Chandler, M., & Heffer, R. W. (2009). The influence of parenting styles, achievement motivation, and self-efficacy on academic performance in college students. *Journal of College Student Development*, *50*(3), 337-346. doi: 10.1353/csd.0.0073
- Ullman, C., & Tatar, M. (2001). Psychological adjustment among Israeli adolescent immigrants: A report on life satisfaction, self-concept, and self-esteem. *Journal of Youth and Adolescence*, *30*(4), 449–463. doi: 10.1023/A:1010445200081
- Unisa. (2011). *A Framework and Strategy for Enhancing Student Success at Unisa – Final Report*. Retrieved April 30, 2013, from <http://uir.unisa.ac.za/handle/10500/3277>
- University of Cape Town. (2007). *Graduation results 2007*. Retrieved May 12, 2010, from http://www.uct.ac.za/usr/press/December_graduation_2007.doc
- University of Cape Town. (2010). *Research Office*. Retrieved May 12, 2010, from http://www.researchoffice.uct.ac.za/publication_count/stats

- University World News. (2007a, October). *South Africa: Student drop-out rates alarming*. Retrieved June 25, 2008, from <http://www.universityworldnews.com/article.php?story=20071025102245380>.
- University World News. (2007b, October). *Germany: Heavy cost of student drop-outs*. Retrieved June 25, 2008, from <http://www.universityworldnews.com/article.php?story=20071025102357719>.
- University World News. (2008, March). *UK: Nearly a quarter of students' dropout*. Retrieved June 25, 2008, from <http://www.universityworldnews.com/article.php?story=20080228155056102>.
- Upcraft, M. L., Gardner, J. N., & Barefoot, B. O. (2005). Introduction: The first year of college revisited. In M. L. Upcraft, J. N. Gardner, & B. O. Barefoot (Eds.), *Challenging and supporting the first-year student: A handbook for improving the first year of college* (pp. 1-12). San Francisco: Jossey Bass.
- Valentine, J. C., DuBois, D. L., & Cooper, H. (2004). The relations between self-beliefs and academic achievement: A meta-analytic review. *Educational Psychologist, 39*(2), 111–133. doi: 10.1207/s15326985ep3902_3
- Vallerand, R. J., & Bissonnette, R. (1992). Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study. *Journal of Personality 60*(3), 599-620. doi: 10.1111/j.1467-6494.1992.tb00922.x
- Vallerand, R. J., Pelletier, L. G., Blais, M. R., Briere, N. M., Senecal, C., & Vallieres, E. F. (1992). The academic motivation scale: a measure of intrinsic, extrinsic, and amotivation in education. *Educational and Psychological Measurement, 52*(4), 1003–1017. doi: 10.1177/0013164492052004025
- van der Meij, H. (1988). Constraints on question asking in classrooms. *Journal of Educational Psychology, 80*(3), 401-405. Retrieved from PsycINFO database.

van der Meij, H. (1990). Question asking: To know that you do not know is not enough.

Journal of Educational Psychology, 82(3), 505-512. Retrieved from PsycINFO database.

van der Merwe, D., & de Beer, M. (2006). Challenges of student selection: Predicting academic performance. *South African Journal of Higher Education*, 20(4), 547-562.

van Eeden, R., de Beer, M., & Coetzee, C. H. (2001). Cognitive ability, learning potential, and personality traits as predictors of academic achievement by engineering and other science and technology students. *South African Journal of Higher Education*, 15(1), 171-179.

Van Overwalle, F. (1989) Success and failure of freshmen at universities – a search for determinants. *Higher Education*, 18(3), 287-308. doi: 10.1007/BF00138185

Van Rooijen, L. (1986). Advanced students' adaptation to college. *Higher Education*, 15(3-4), 197–209. doi: 10.1007/BF00129211

van Schalkwyk, S., Menkveld, H., & Ruiters, J. (2010). What's the story with class attendance? First-year students: Statistics and perspectives. *South African Journal of Higher Education*, 24(4), 630-645.

Vanthournout, G., Gijbels, D., Coertjens, L., Donche, V., & Van Petegem, P. (2012). Students' Persistence and Academic Success in a First-Year Professional Bachelor Program: The Influence of Students' Learning Strategies and Academic Motivation. *Education Research International*, vol. 2012, Article ID 152747, 10 pages. doi: 10.1155/2012/152747.

Vaughan, P.W. (2007). Path Analysis. In R. F. Baumeister & K. D. Vohs (Eds.), *Encyclopedia of Social Psychology*. Retrieved June 14, 2011, from http://0-www.sage-ereference.com.oasis.unisa.ac.za/socialpsychology/Article_n389.html.

- Vermeir, I., & van Kenhove, P., (2008). Gender differences in double standards. *Journal of Business Ethics*, 81(2), 281-295. doi:10.1007/s10551-007-9494-1
- Vogel, D. L., & Wester, S. R. (2003). To seek help or not to seek help: the risks of self-disclosure. *Journal of Counseling Psychology*, 50(3), 351-361. doi: 10.1037/0022-0167.50.3.351
- Vuong, M., Brown-Welty, S., & Tracz, S. (2010). The effects of self-efficacy on academic success of first-generation college sophomore students. *Journal of College Student Development*, 51(1), 50-64. doi: 10.1353/csd.0.0109
- Wachelka, D., & Katz, R. C. (1999). Reducing test anxiety and improving academic self-esteem in high school and college students with learning disabilities. *Journal of Behavior Therapy*, 30(3), 191-198. doi: 10.1016/S0005-7916(99)00024-5
- Wallace, K. (2012, March 9). Therapy dog tops in class at University of Ottawa. *Toronto Star*. Retrieved from http://www.thestar.com/news/canada/2012/03/09/therapy_dog_tops_in_class_at_university_of_ottawa.html
- Walleri, D. R. (1981). *Student retention and attrition in the community college: A review and research design*. Gresham, OR: Oregon Community College Deans of Students Consortium, Oregon State Department of Education (ERIC Document Reproduction Service No. ED 210 064).
- Warren, D. (1997). *Learning and teaching in higher education, with reference to the South African context of student diversity*. Unpublished manuscript. Cape Town: University of Cape Town.
- Watts, C., & Pickering, A. (2000). Pay as you learn: Student employment and academic progress. *Education and Training*, 42(3), 129-135. doi: 10.1108/00400910010372670

- Webometrics (2012). Ranking Web of Universities. Retrieved December 12, 2012, from <http://www.webometrics.info/en/Africa>
- Webometrics (2013). Ranking Web of Universities. Retrieved December 4, 2013, from <http://www.webometrics.info/en/Africa>
- Webster, E., & Mosoetsa, S. (2001). *At the chalk face: Managerialism and the changing academic workplace 1995-2001*. Pretoria, South Africa: Centre for Higher Education Transformation.
- Wegener, D., & Fabigar, L. (2004). Constructing and Evaluating Quantitative Measures for Social Psychological Research: Conceptual Challenges and Methodological Solutions. *The SAGE Handbook of Methods in Social Psychology*. Retrieved June 14, 2011, from http://0-www.sage-reference.com.oasis.unisa.ac.za/hdbk_socpsychmethods/Article_n7.html
- Weissberg, N. C., & Owen, D. R. (2005). Do psychosocial and study skill factors predict college outcomes? Comment on Robbins et al. (2004). *Psychological Bulletin*, *131*(3), 407-409. doi: 10.1037/0033-2909.131.3.407
- Welman, J. C. (2003). Work status as a predictor of academic performance in the field of distance higher education. *South African Journal of Industrial Psychology*, *29*(1), 44-51. Retrieved from <https://ujdigispace.uj.ac.za/handle/10210/2724>
- White, T. J., & Sedlacek, W. E. (1986). Noncognitive predictors: Grades and retention of specially admitted students. *The Journal of College Admissions*, *3*, 20-23.
- Whitesell, N. R., Mitchell, C. M., Spicer, P., & The Voices of Indian Teens Project Team (2009). A longitudinal study of self-esteem, cultural identity, and academic success among American Indian adolescents. *Cultural Diversity and Ethnic Minority Psychology*, *15*(1), 38-50. doi: 10.1037/a0013456

- Wigfield, A., & Eccles, J. S. (2002). *Development of Achievement Motivation*. San Diego: Academic Press.
- Williams, E.G. (2004). *Academic, research, and social self-efficacy among African American Pre-McNair scholar participants and African American Post-McNair scholar participants* (Unpublished doctoral thesis). Virginia Polytechnic Institute and State University, United States of America.
- Wintre, M. G., & Bowers, C. D. (2007). Predictors of persistence to graduation: Extending a model and data on the transition to university model. *Canadian Journal of Behavioural Science, 39*(3), 220-234. Retrieved from PsycINFO database.
- Wintre, M. G., & Yaffe, M. (2000). First-year students' adjustment to university life as a function of relationships with parents. *Journal of Adolescent Research, 15*(1), 9-37. doi: 10.1177/0743558400151002
- Wohlgemuth, E., & Betz, N. E. (1991). Gender as a moderator of the relationship of stress and social support to physical health in college students. *Journal of Counselling Psychology, 38*(3), 367-374. doi: 10.1037/0022-0167.38.3.367
- Wolfgang, M., & Dowling, W. (1981). Differences in motivation of adult and younger undergraduates. *Journal of Higher Education, 52*(6), 640-648. Retrieved from EBSCOhost database.
- Woo, T. O., & Frank, N. (2000). Academic performance and perceived validity of grades: An additional case for self-enhancement. *The Journal of Social Psychology, 140*(2), 218-226. doi: 10.1080/00224540009600462
- Wood, T. 1998. Issues relating to the cognitive development of students at historically disadvantaged institutions. *South African Journal of Higher Education, 12*(1), 87-94.
- Woodard, P. G., & Suddick, D. E. (1992). Self-esteem of older adult college students'. *Perceptual and Motor Skills, 74*(1), 193-194. doi:10.2466/pms.1992.74.1.193

- Woollacott, L., & Henning, L. (2004). Dealing with under-preparedness in engineering entrants: A perspective from Wits. *For Engineering Educators*, 8, 3-8.
- World Economic Forum. (2012-2013). *The Global Competitiveness Report 2012-2013. Full Data Edition*. Retrieved 25 February, 2013, from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf
- Wrench, J. S., Richmond, V. P., & Gorhan, J. (2009). *Communication, affect, and learning in the classroom*. (3rd ed.). Acton, MA: Tapestry Press.
- Wright, S. (1921). Correlation and causation. *Journal of Agricultural Research*, 20(7), 557-585. Retrieved from http://www.ssc.wisc.edu/soc/class/soc952/Wright/Wright_Correlation%20and%20Causation.pdf
- Wright, S. (1934). The method of path coefficients. *Annals of Mathematical Statistics*, 5(3), 161-215. Retrieved from http://www.ssc.wisc.edu/soc/class/soc952/Wright/Wright_The%20Method%20of%20Path%20Coefficients.pdf
- Wyman, F. J. (1997). A predictive model of retention rate at regional two-year colleges. *Community College Review*, 25(1), 29–58. doi: 10.1177/009155219702500104
- Yaffe, M. (1997). First-year university students' adjustment to university life as a function of relationships with parents. (Doctoral dissertation, York University, Canada, 1997). *Dissertation Abstracts International*, 58, 5675B. Retrieved from First Search/Dissertation Abstracts International database.
- Yarbrough, D. W., & Schaffer, J. L. (1990). A comparison of school-related anxiety experienced by nontraditional versus traditional students. *College Student Journal*, 24(1), 81-90. Retrieved from PsycINFO database.

- Yeld, N. (2003). Academic literacy and numeracy profiles: An analysis of some results from the AARP and TELP tests of incoming students (2001/2002 entry years). In South African Universities' Vice Chancellors' Association – Committee of Technikon Principals. Higher Education Admissions Project. *Into Higher Education. Perspectives on Entry Thresholds and Enrolment Systems* (pp. 21-52). Pretoria: SAUVCA-CPT HE Admissions Project.
- Yeld, N., Grobler, M., & Sekwane, C. (2004). *Investigation into the examination of English Second/Additional Language by selected examination authorities in the years 1992, 1999, 2001 and 2003*. Pretoria, South Africa: Umalusi.
- Yousefi, F., Mansor, M. B., Juhari, R. B., Redzuan, M., Talib, M. A., Kumar, V., Naderi, H. (2009). Memory as mediator between test-anxiety and academic achievement in high school students. *European Journal of Scientific Research*, 35(2), 274-280.
- Yousefi, F., Mansor, M.B., Juhari, R.B., Redzuan, M., & Talib, M.A. (2010). The Relationship between Gender, Age, Depression and Academic Achievement. *Current Research in Psychology* 1(1), 61-66.
- Zaaiman, H., van der Flier, H., & Thijs, G.D. (1998). Selecting South African higher education students: critical issues and proposed solutions. *South African Journal of Higher Education*, 12(3), 96-101.
- Zajacova, A., Lynch, S. M., & Espenshade, T. J. (2005). Self-efficacy, stress, and academic success in college. *Research in Higher Education*, 46(6), 677-706. doi: 10.1007/s11162-004-4139-z
- Zeidner, M. (1998). *Test Anxiety: The State of the Art*. New York: Plenum Press.
- Zimmerman, M. A., Caldwell, C. H., & Bernat, D. H. (2002). Discrepancy between self-report and school-record grade point average: Correlates with psychosocial out-

comes among African American adolescents. *Journal of Applied Social Psychology*,
32(1), 86-109. doi: 10.1111/j.1559-1816.2002.tb01421.x

Appendix A

Email to students inviting them to participate in the research

From: MSommer@ufh.ac.za

To: All first and second year students

Subject: Participation in research study

Dear Student,

I am conducting research about the experiences of students at the University of Fort Hare for a doctoral dissertation. To do this, I am conducting a survey among students, using a questionnaire developed for this purpose. I would appreciate your assistance with the study a GREAT DEAL. We hope that the results of the study will help the University of Fort Hare to better understand and assist students in their adjustment to university. The information you provide will be kept strictly confidential.

Please click on the following link to take part: www.surveymonkey.com/s/GVBJ6FK
(Or copy and paste the link into your internet browser).

If you have any further questions about this study, you may contact Marc Sommer, MA at MSommer@ufh.ac.za or Prof. Kitty Dumont, Ph.D. at kitty@kdumont.co.za.

Thank you for your time and participation!

Friendly regards

Marc Sommer

Appendix B

Questionnaire

Dear Student,

I am conducting research about the experiences of students at the University of Fort Hare for a doctoral dissertation. To do this, I am conducting a survey among students, using a questionnaire developed for this purpose. I would appreciate your assistance with the study a GREAT DEAL. We hope that the results of the study will help the University of Fort Hare to better understand and assist students in their adjustment to university. The information you provide will be kept strictly confidential.

Consent For Own Participation

I understand that this confidential study involves research for a doctoral dissertation conducted by Marc Sommer, MA under the supervision of Prof. Kitty Dumont, Ph.D. at the University of Fort Hare.

I understand that my participation in this study will involve answering questions about myself and my relationships. I understand that I will be asked to complete a questionnaire of demographic information. I understand that this survey will take approximately 35-40 minutes to complete.

I understand that my participation in this study is completely voluntary and that I may refuse to participate or withdraw my consent to participate at any time. I understand that my identity and responses on the questionnaires will be kept in strict confidence.

I have been informed that only the principal investigator, Marc Sommer, MA, and Prof. Kitty Dumont, Ph.D. will have access to the data collected during this study.

If I have any further questions about this study, I may contact Marc Sommer, MA at MSommer@ufh.ac.za or Prof. Kitty Dumont, Ph.D. at KDumont@ufh.ac.za.

Thank you for your time and participation !

I understand that by selecting "I accept" below, I am giving my consent to participate in this research study. I have read this form and understand what it says. I am 18 years of age or older and voluntarily agree to participate in this research project.

I accept.

Yes	No
-----	----

A. Demographic Questions

1. What is your student number?

2. What is your cell phone or telephone number where we can contact you?

3. What is your valid email address where we can contact you?

4. How old are you?

5. What is your gender? *Please tick the appropriate box.*

Male	Female
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6. What population group do you belong to? *Please tick the appropriate box.*

Black	White	Coloured	Indian
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Other (please specify) _____

7. What is your first language? *Please tick the appropriate box.*

English	Xhosa
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Other (please specify) _____

8. What type of high school did you attend? *Please tick the appropriate box.*

Government	Private
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Other (please specify) _____

9. What year of study are you currently in? *Please tick the appropriate box.*

1st	2nd	3rd	4th
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10. What degree are you registered for? (i.e., BA Administration, etc.)

11. Do you live in a university residence? *Please tick the appropriate box.*

Yes	No
-----	----

12. Are you employed? *Please tick the appropriate box.*

Employed	Part-time	Not employed
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Appendix C

Item analysis and psychometric properties of all scales (help-seeking scale, sub-scales of academic motivation, Rosenberg self-esteem scale, perceived stress scale, academic overload scale by Muller & Louw, test-anxiety scale, self-efficacy scale, perceived social support from friends scale, perceived social support from family scale and sub-scales of the Student Adjustment to College Questionnaire) used in the present study

Single sample *t*-tests comparing the means of the scales to the midpoint of the scales

Item Analyses

Help-seeking scale

Table C1: Item Analysis of all Items Measuring Help-Seeking

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
HS 1	13.79	8.819	.552	.311	.608
HS 2	13.89	10.646	.388	.161	.714
HS 3	12.99	11.168	.500	.321	.643
HS 4	12.68	11.022	.581	.378	.606

Scale summary: M=17.78, Variance=16.866, SD=4.107, Cronbach's alpha: .707, Standardized alpha: .721

Academic motivation sub-scales

Intrinsic motivation

Table C2: Item Analysis of all Items Measuring Intrinsic Motivation

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AMS 2	54.73	124.132	.608	.444	.862
AMS 4	55.35	126.529	.481	.295	.870
AMS 6	55.75	121.731	.569	.416	.865
AMS 9	54.74	121.794	.662	.463	.859
AMS 11	55.77	124.666	.551	.516	.865
AMS 13	55.45	123.761	.537	.353	.867
AMS 16	54.33	131.976	.498	.328	.869
AMS 18	55.74	119.342	.641	.570	.860
AMS 20	55.17	125.662	.547	.351	.866
AMS 23	54.37	129.208	.521	.350	.867
AMS 25	55.20	121.922	.624	.462	.861
AMS 27	54.60	129.015	.558	.373	.865

Scale summary: M=60.11, Variance=147.057, SD=12.127, Cronbach's alpha: .874, Standardized alpha: .876

External regulation

Table C3: Item Analysis of all Items Measuring External Regulation

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AMS 1	17.35	10.951	.383	.151	.593
AMS 8	16.65	13.589	.364	.142	.592
AMS 15	16.55	12.621	.453	.214	.535
AMS 22	16.98	11.429	.462	.220	.521

Scale summary: M=22.51, Variance=19.226, SD=4.385, Cronbach's alpha: .630, Standardized alpha: .638

Identified regulation

Table C4: Item Analysis of all Items Measuring Identified Regulation

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AMS 3	18.33	6.429	.310	.102	.531
AMS 10	18.35	6.729	.312	.101	.530
AMS 17	18.74	5.418	.407	.176	.451
AMS 24	18.81	5.208	.391	.169	.467

Scale summary: M=24.74, Variance=9.245, SD=3.041, Cronbach's alpha: .570, Standardized alpha: .569

Introjected regulation

Table C5: Item Analysis of all Items Measuring Introjected Regulation

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AMS 7	15.21	19.124	.612	.444	.718
AMS 14	15.29	21.892	.480	.241	.785
AMS 21	15.53	20.487	.600	.364	.724
AMS 28	14.62	20.950	.684	.496	.689

Scale summary: M=20.22, Variance=34.171, SD=5.846, Cronbach's alpha: .783, Standardized alpha: .787

Amotivation

Table C6: Item Analysis of all Items Measuring Amotivation

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AMS 5	3.86	4.840	.419	.183	.624
AMS 12	3.55	3.410	.477	.242	.616
AMS 19	3.85	4.415	.490	.300	.578
AMS 26	3.97	5.218	.511	.306	.597

Scale summary: M=5.07, Variance=7.159, SD=2.676, Cronbach's alpha: .670, Standardized alpha: .695

Self-esteem scale

Table C7: Item Analysis of all Items Measuring Self-Esteem

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
RS 1	35.30	20.417	.238	.200	.552
RS 2	36.35	15.611	.428	.216	.487
RS 3	35.23	21.225	.190	.112	.562
RS 4	35.19	21.480	.158	.094	.567
RS 5	35.54	17.669	.406	.182	.503
RS 6	35.70	17.295	.380	.240	.508
RS 7*	35.52	20.738	.151	.071	.570
RS 8*	38.00	19.875	.045	.050	.629
RS 9	35.26	18.374	.347	.142	.521
RS 10	35.13	20.177	.317	.225	.540

Scale summary: M=39.69, Variance=22.731, SD=4.768, Cronbach's alpha: .573, Standardized alpha: .590

* Items RS 7 and RS 8 were removed from the scale and from further analyses.

Perceived stress scale

Table C8: Item Analysis of all Items Measuring Perceived Stress

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PSS 1	15.41	29.110	.488	.317	.736
PSS 2	15.29	28.449	.512	.306	.732
PSS 3	14.88	29.328	.526	.324	.731
PSS 4*	16.51	34.143	.151	.052	.775
PSS 5	16.70	32.470	.344	.274	.755
PSS 6	16.93	31.805	.391	.266	.750
PSS 7	15.82	30.262	.406	.241	.748
PSS 8	15.63	28.943	.447	.278	.742
PSS 9	16.29	30.730	.398	.217	.748
PSS 10	15.53	27.117	.578	.369	.721

Scale summary: M=17.66, Variance=36.374, SD=6.031, Cronbach's alpha: .764, Standardized alpha: .757

* Item PSS 4 was removed from the scale and from further analyses.

Academic overload scale

Table C9: Item Analysis of all Items Measuring Academic Overload

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AO 1	13.13	7.298	.404	.335	.193
AO 2	12.70	6.976	.353	.434	.193
AO 3	12.64	6.254	.368	.372	.150
AO 4*	13.68	10.612	-.309	.180	.593
AO 5	13.30	6.118	.354	.182	.153
AO 6*	14.30	7.966	.037	.017	.405

Scale summary: M=15.95, Variance=9.610, SD=3.100, Cronbach's alpha: .353, Standardized alpha: .399

* Items AO 4 and AO 6 were removed from the scale and from further analyses.

Test-anxiety scale

Table C10: Item Analysis of all Items Measuring Test-Anxiety

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
TA 1*	24.52	44.379	.115	.181	.785
TA 2	25.24	38.414	.442	.311	.746
TA 3	26.26	38.150	.516	.417	.735
TA 4	25.59	37.706	.478	.384	.740
TA 5	26.39	37.902	.582	.450	.727
TA 6	26.29	37.246	.541	.398	.731
TA 7	26.44	39.064	.573	.428	.731
TA 8	26.78	42.655	.231	.234	.772
TA 9	26.80	40.275	.373	.271	.755
TA 10	26.24	38.966	.492	.384	.739

Scale summary: M=28.95, Variance=47.503, SD=6.892, Cronbach's alpha: .766, Standardized alpha: .767

* Item TA 1 was removed from the scale and from further analyses.

Self-efficacy scale

Table C11: Item Analysis of all Items Measuring Self-Efficacy

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ACS 1	15.88	7.491	.259	.109	.768
ACS 2	16.13	6.786	.480	.235	.702
ACS 3	16.17	6.011	.554	.340	.671
ACS 4	16.46	5.367	.584	.428	.658
ACS 5	16.45	5.381	.639	.426	.632

Scale summary: M=20.27, Variance=9.102, SD=3.017, Cronbach's alpha: .738, Standardized alpha: .731

Perceived social support scales

Perceived social support from friends scale

Table C12: Item Analysis of all Items Measuring Perceived Social Support from Friends

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PSS-fr 1	17.59	16.601	.572	.330	.772
PSS-fr 2	16.78	17.050	.622	.390	.757
PSS-fr 3	17.47	17.189	.527	.288	.786
PSS-fr 4	16.91	17.401	.627	.398	.757
PSS-fr 5	17.38	16.215	.608	.388	.761

Scale summary: M=21.53, Variance=25.160, SD=5.016, Cronbach's alpha: .804, Standardized alpha: .807

Perceived social support from family scale

Table C13: Item Analysis of all Items Measuring Perceived Social Support from Family

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PSS-fa 1	18.75	20.934	.575	.344	.856
PSS-fa 2	18.59	19.097	.740	.548	.815
PSS-fa 3	18.80	19.379	.655	.433	.837
PSS-fa 4	18.95	19.324	.704	.536	.824
PSS-fa 5	18.57	19.099	.718	.550	.821

Scale summary: M=23.41, Variance=29.541, SD=5.435, Cronbach's alpha: .860, Standardized alpha: .860

Student Adjustment to College Questionnaire sub-scales

Academic adjustment

Table C14: Item Analysis of all Items Measuring Academic Adjustment

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SACQ 3	58.06	122.757	.511	.300	.699
SACQ 5	57.27	133.917	.203	.106	.731
SACQ 6	59.72	123.322	.298	.195	.723
SACQ 9	59.09	118.533	.333	.171	.719
SACQ 11	59.03	120.182	.387	.255	.710
SACQ 17	60.02	111.200	.477	.349	.694
SACQ 19	59.78	108.519	.492	.327	.691
SACQ 22	59.08	121.502	.270	.166	.730
SACQ 25	59.69	105.671	.539	.356	.682
SACQ 28	57.84	121.920	.445	.282	.704

Scale summary: M=65.51, Variance=142.344, SD=11.931, Cronbach's alpha: .730, Standardized alpha: .734

Social adjustment

Table C15: Item Analysis of all Items Measuring Social Adjustment

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SACQ 1	55.13	108.170	.388	.307	.591
SACQ 4	56.02	106.053	.343	.246	.594
SACQ 8	57.38	102.043	.327	.216	.595
SACQ 12*	58.35	111.319	.109	.050	.648
SACQ 16*	57.18	114.570	.057	.095	.659
SACQ 23	55.64	109.643	.315	.167	.601
SACQ 27	55.97	96.038	.475	.293	.559
SACQ 31	56.18	95.187	.414	.232	.572
SACQ 32	56.24	99.122	.335	.196	.593
SACQ 33	54.86	107.028	.319	.148	.598

Scale summary: M=62.55, Variance=124.377, SD=11.152, Cronbach's alpha: .627, Standardized alpha: .647

* Items SACQ 12 and SACQ 16 were removed from the scale and from further analyses.

Personal and emotional adjustment

Table C16: Item Analysis of all Items Measuring Personal and Emotional Adjustment

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SACQ 2	55.11	208.500	.575	.351	.814
SACQ 7	54.75	212.122	.488	.282	.823
SACQ 10	55.18	216.269	.431	.220	.828
SACQ 15	54.82	217.113	.407	.201	.830
SACQ 18	53.96	211.701	.504	.283	.821
SACQ 20	53.36	205.050	.576	.367	.814
SACQ 24	53.90	204.331	.622	.415	.810
SACQ 26	54.50	206.086	.526	.311	.819
SACQ 29	54.94	211.677	.514	.291	.820
SACQ 36	53.96	205.404	.610	.404	.811

Scale summary: M=60.50, Variance=254.358, SD=15.949, Cronbach's alpha: .834, Standardized alpha: .835

Institutional attachment

Table C17: Item Analysis of all Items Measuring Institutional Attachment

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SACQ 1	65.03	111.462	.467	.307	.705
SACQ 4	65.92	112.061	.340	.222	.721
SACQ 13	64.51	116.337	.365	.380	.719
SACQ 14	65.45	100.549	.562	.510	.684
SACQ 21	65.79	100.193	.452	.434	.704
SACQ 22	66.02	107.580	.330	.138	.725
SACQ 30	64.79	111.950	.300	.113	.727
SACQ 34	64.96	102.454	.428	.327	.708
SACQ 35	63.94	121.355	.264	.163	.730
SACQ 37	65.64	105.608	.476	.300	.700

Scale summary: M=72.45, Variance=130.650, SD=11.430, Cronbach's alpha: .734, Standardized alpha: .739

Single Sample T-Test Analyses

Table C18: Single sample t-test, comparing mean to mid-point of scale

Scale	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Midpoint</i>	t-test		
							<i>t</i>	<i>df</i>	<i>p</i>
Help-seeking	280	4.45	1.03	1.00	6.00	3.50	15.41	279	< 0.001
<i>Motivation</i>									
Intrinsic	280	5.01	1.01	1.00	7.00	4.00	16.70	279	< 0.001
Identified regulation	280	6.19	0.76	1.00	7.00	4.00	48.11	279	< 0.001
Introjected regulation	280	5.06	1.46	1.00	7.00	4.00	12.12	279	< 0.001
External regulation	280	5.63	1.10	1.00	7.00	4.00	24.83	279	< 0.001
Amotivation	280	1.27	0.67	1.00	7.00	4.00	- 68.32	279	< 0.001
<i>Self-esteem</i>									
Self-esteem	280	4.23	0.53	1.00	6.00	3.50	23.08	279	< 0.001
Perceived stress	280	1.77	0.60	0.00	4.00	2.00	- 4.26	279	< 0.001
Academic overload	280	3.01	0.75	1.00	5.00	3.00	0.16	279	> 0.05
Test-anxiety	280	2.73	0.74	1.00	6.00	3.50	- 17.53	279	< 0.001
Self-efficacy	280	4.05	0.60	1.00	5.00	3.00	29.24	279	< 0.001
<i>Perceived social support</i>									
From friends	280	4.31	1.00	1.00	6.00	3.50	13.45	279	< 0.001
From family	280	4.68	1.09	1.00	6.00	3.50	18.21	279	< 0.001
<i>Adjustment to university</i>									
Academic	280	6.55	1.19	1.00	9.00	5.00	21.75	279	< 0.001
Social	280	6.26	1.12	1.00	9.00	5.00	18.83	279	< 0.001
Personal & Emotional	280	6.05	1.60	1.00	9.00	5.00	11.02	279	< 0.001
Institutional Attachment	280	7.25	1.14	1.00	9.00	5.00	32.87	279	< 0.001